

# Hand in Hand for a decentralized Energy Transition

On the role of support and partner organizations in  
fostering the establishment and durable collective  
action of renewable energy producing cooperatives

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## Abstract

In seeking novel ways to addressing global climate change, renewable energy producing cooperatives (REPCs) can potentially generate several benefits with regard to a decentralized energy transition. REPCs represent a direct citizen participation model to realize local renewable energy (RE) projects with a long-term return rate to recover the initial investments, as the main focus of REPCs lies on sufficing member utility rather than increasing short-term shareholder value. They enable local ownership and create regional added-value. REPCs democratic structure and low entrance fee additionally allow for broad citizen participation, independent of income. Due to its dependency on durable collective action in the founding process and the later management of the REPC, many interested individuals or interest groups face the problem that other individuals are often willing to participate in terms of financially investing in the local REPCs and their projects, but only few are willing to also establish and manage the REPC on a voluntary basis in its early development. An additional hurdle is the knowledge that is required from different fields of expertise (e.g. business administration). However, intermediary organizations, like cooperative associations, market actors and local government agencies that support the founding process and the foster the further development of REPCs can potentially help to overcome this issue. Thus far, there is only little scientific research on this issue.

This thesis started from the identified the need to generate theoretical and practical insights on the role of the support by intermediate organizations in order to understand the demands of REPCs in the founding process and their further development and improve support. The main research objective was to identify and analyze the impact of specific forms of support provided by intermediary organizations on the establishment and on the durable collective action capacity of REPCs. This objective is fulfilled by firstly establishing a theoretical framework that includes forms of support of intermediary organizations as well as the founding process and the durable collective action capacity of REPCs. The founding process is conceptualized as a project with four phases and respective tasks that need to be fulfilled by the founding members. The durable collective action capacity of REPCs is determined by the management board's and other active members' (1) available human capital; (2) intrinsic motivation (3) and extrinsic motivation. Support by intermediary organizations encompasses (1) financial support; (2) advocacy support; (3) networking or alliance-building support; and (4) provision of research and informational resources. The framework is subsequently applied to explore the joint support concept of the renewable energy cooperative association Verband der Bürger Energiegenossenschaften Baden-Württemberg (VBBW) and the energy provider EnBW Regional AG for interest groups and REPCs in the federal state of Baden-Württemberg in Germany. This is done via a comparative case study, which includes two sample cases of REPCs that received support by VBBW and EnBW and two control cases of REPCs without such support. The data for the case study included semi-structured interviews with active members from the selected sample and control cases, respectively, extensive online research and a survey that was send out to larger, according to selection criteria chosen, sample and control groups.

The analysis revealed specific forms of support that are useful to very useful for interest groups in the founding process and that strengthen the durable collective action capacity of REPCs. Useful support in the founding process include (1) the provision of research and information in form of an informational package that comprise all the relevant documents in the founding process (e.g. necessary legal documents, sample code of conducts and business plans); (2) the provision of advocacy support in terms of promoting the founding event through informational flyers and newspaper ads as well as staff provision to host the founding event; (3) alliance-building and networking support through involving the local municipality in the REPC as an additional partner that provides the REPC with rooftops free-of-charge or for a low rent. Useful support to foster the durable collective action capacity include (1) the provision of research and information in the form of seminars on the roles and tasks of the management and advisory board and a member administration software that facilitates the management of the REPC; (2) the provision of networking and alliance-building support through an institutionalized meeting structure, where members can frequently

exchange knowledge and experiences with other VBBW REPCs in annual and regional network meetings organized by the VBBW. With regard to the intrinsic and extrinsic motivation of the REPCs' active members no influence of the support could be discerned. Additionally, it was noteworthy that especially the VBBW REPCs realized much less projects since the amendment of the EEG in 2012, which reduced the profitability of this business model.

*Key words: renewable energy cooperatives; decentralized energy system; intermediary organization; durable collective action*

# Table of Contents

|  |           |
|--|-----------|
| Acknowledgements .....   | i         |
| Abstract .....   | ii        |
| Index of tables .....  | vii       |
| Index of figures.....  | viii      |
| List of Abbreviations .....  | ix        |
| <b>1. Introduction .....</b>   | <b>1</b>  |
| 1.1 <i>Problem definition</i> .....  | 1         |
| 1.2 <i>Research objective and research questions</i> .....   | 6         |
| 1.3 <i>Research framework</i> .....  | 7         |
| 1.4 <i>Scientific and societal contribution</i> .....  | 9         |
| 1.4.1 <i>Scientific relevance</i> .....  | 9         |
| 1.4.2 <i>Social relevance</i> .....  | 10        |
| 1.4.3 <i>Connection to the Environmental Governance (EG) Track and the Copernicus Institute</i> ...  | 10        |
| 1.5 <i>Outline of the thesis</i> .....   | 10        |
| <b>2. Theoretical part.....</b>  | <b>12</b> |
| 2.1 <i>Background on renewable energy cooperatives</i> .....   | 12        |
| 2.1.1 <i>The cooperative business model as a citizen participation model to realize local and regional renewable energy projects</i> ..... | 12        |
| 2.1.2 <i>A typology of renewable energy cooperatives</i> .....   | 14        |
| 2.2 <i>The dependent variables founding process and durable collective action capacity</i> .....   | 17        |
| 2.2.1 <i>The founding process of a REPC</i> .....  | 17        |
| 2.2.1.1 <i>Orientation phase</i> .....   | 18        |
| 2.2.1.2 <i>Planning phase</i> .....  | 19        |
| 2.2.1.3 <i>Founding phase</i> .....  | 20        |
| 2.2.1.4 <i>Project phase</i> .....   | 20        |
| 2.2.1.5 <i>Overview of the dependent variable of the founding process</i> .....  | 21        |
| 2.2.2 <i>Durable collective action capacity</i> .....  | 22        |
| 2.2.2.1 <i>Human capital in REPCs</i> .....  | 23        |
| 2.2.2.1.1 <i>Management capacity</i> .....   | 24        |
| 2.2.2.1.2 <i>Organizational strength</i> .....   | 26        |
| 2.2.2.1.3 <i>Connections to others</i> .....   | 26        |
| 2.2.2.1.4 <i>Overview of the dependent variable human capital</i> .....  | 27        |
| 2.2.2.2 <i>Intrinsic and extrinsic motivation for durable collective action in REPCs</i> .....   | 28        |
| 2.2.2.2.1 <i>Intrinsic motivation</i> .....  | 28        |
| 2.2.2.2.1.1 <i>Social gratification</i> .....  | 29        |
| 2.2.2.2.1.2 <i>Civic gratification</i> .....   | 29        |
| 2.2.2.2.1.3 <i>Overview of the dependent variable intrinsic motivation</i> .....   | 30        |
| 2.2.2.2.2 <i>Extrinsic motivation</i> .....  | 31        |
| 2.2.2.2.2.1 <i>Confidence in future benefits</i> .....   | 31        |
| 2.2.2.2.2.2 <i>Presence of a non-monetary incentive system</i> .....   | 31        |
| 2.2.2.2.2.3 <i>Overview of the dependent variable extrinsic motivation</i> .....   | 32        |
| 2.3 <i>The independent variable support by intermediary organizations</i> .....  | 32        |
| 2.3.1 <i>Intermediary organizations in the context of REPCs</i> .....  | 32        |
| 2.3.1.1 <i>Definition of support organizations</i> .....   | 33        |
| 2.3.1.2 <i>Definition of partner organizations</i> .....   | 34        |
| 2.3.2 <i>Support provided by intermediary organizations</i> .....  | 35        |
| 2.3.2.1 <i>Support organization assistance in the context of REPCs</i> .....   | 35        |
| 2.3.2.2 <i>Partner organization assistance in the context of REPCs</i> .....   | 37        |
| 2.4 <i>Visualization of the theoretical framework</i> .....  | 38        |
| <b>3. Methodology .....</b>  | <b>40</b> |
| 3.1 <i>Research Strategy</i> .....   | 40        |
| 3.2 <i>Case selection</i> .....  | 40        |

|   |            |
|---|------------|
| 3.3 Data collection and analysis .....  | 43         |
| 3.4 Operationalization and measurement of the independent and dependent variables .....   | 46         |
| 4. Background information on the German REPC context .....  | <b>49</b>  |
| 4.1 Development of REPCs and renewable energy support policy in Germany .....   | 49         |
| 4.2 On the role of regional cooperative audit associations (CAAs) in Germany .....  | 51         |
| 4.3 Support organizations (SOs) in form of renewable energy cooperative associations in Germany .....                           | 54         |
| 4.4 Relevant partner organizations (POs) in Germany .....   | 55         |
| 4.5. The VBBW and EnBW Regional AG .....  | 57         |
| 4.5.1 REPCs as part of the sustainability strategy of the EnBW AG .....   | 57         |
| 4.5.2 The support concept of the VBBW and EnBW Regional AG .....  | 58         |
| 5. Analysis .....   | <b>63</b>  |
| 5.1 Analysis of the questionnaire results .....   | 63         |
| 5.2 Analysis of the online research results .....   | 70         |
| 5.3 Analysis of the cases .....   | 77         |
| 5.3.1 Case A .....  | 78         |
| 5.3.2 Case B .....  | 80         |
| 5.3.3 Case C .....  | 84         |
| 5.3.3 Case D .....  | 86         |
| 5.4 Summary of the results .....  | 89         |
| 5.4.1 Relevant forms of SO and PO support in the founding process .....   | 89         |
| 5.4.2 Relevant forms of SO and PO support to foster the durable collective action capacity of a REPC .....                      | 91         |
| 6. Discussion .....   | <b>94</b>  |
| 6.1 Contribution of this research .....   | <b>94</b>  |
| 6.2 Validity of the research results .....  | <b>95</b>  |
| 6.3 Limitations of the research results .....   | <b>98</b>  |
| 6.4 Indications for further research .....  | <b>98</b>  |
| 7. Conclusion .....   | <b>101</b> |
| References .....  | <b>111</b> |
| Appendix .....  | <b>124</b> |
| Appendix 1: Variables and indicators identified in the literature review to construct a preliminary theoretical framework ..... | 124        |
| Appendix 2: Operationalization of the founding process .....  | 125        |
| 2.1 Operationalization of the sub-variable orientation phase .....  | 125        |
| 2.2 Operationalization of the sub-variable planning phase .....   | 126        |
| 2.3 Operationalization of the sub-variable founding phase .....   | 126        |
| 2.4 Operationalization of the sub-variable project phase .....  | 126        |
| Appendix 3: Operationalization of SO and PO support in the founding process .....   | 128        |
| 3.1 Operationalization to measure the utility of SO and PO support in the orientation and planning phase .....                  | 128        |
| 3.2 Operationalization to measure the utility of SO and PO support regarding the founding event .....                           | 128        |
| 3.3 Operationalization to measure the utility of SO and PO support in the project phase .....                                   | 128        |
| Appendix 4: Operationalization of durable collective action capacity .....  | 129        |
| 4.1 Operationalization of human capital .....   | 129        |
| 4.1.1 Operationalization of the sub-variable perceived management capacity .....  | 129        |
| 4.1.2 Operationalization of the sub-variable organizational strength .....  | 130        |
| 4.1.3 Operationalization of the sub-variable Connections to others .....  | 130        |
| 4.2 Operationalization of intrinsic motivation .....  | 131        |
| 4.3 Operationalization of extrinsic motivation .....  | 132        |
| Appendix 5: Case study scores .....   | 133        |
| 5.1 Case study scores on the dependent variable founding process .....  | 133        |
| 5.2 Case study scores on the dependent variable human capital .....   | 133        |

|   |            |
|---|------------|
| 5.3 Case study scores on the dependent variable intrinsic and extrinsic motivation .....                          | 134        |
| <i>Appendix 6: Overview of expert interview partners .....</i>  | <i>134</i> |
| <i>Appendix 7: Interview guides.....</i>  | <i>136</i> |
| 7.1 Interview guides semi-structured interviews with REPC and intermediary organization experts .....             | 136        |
| 7.2 Interview guides semi-structured interviews with practitioners in different types of successful REPCs .....   | 136        |
| 7.3 Interview guides semi-structured interviews for background on VBBW and EnBW Regional AG support concept ..... | 137        |
| 7.4 Interview guides semi-structured interviews with sample group cases (cases A and B).....                      | 137        |
| 7.5 Interview guides semi-structured interviews with control group cases (cases C and D).....                     | 138        |

# Index of tables

|  |     |
|--|-----|
| <i>Figure 1: Ownership distribution of total installed RE-capacity in Germany 2012<br/>(Total = 72,907 MW)</i>   | 2   |
| <i>Figure 2: Schematic representation of the research</i>  | 7   |
| <i>Figure 3: Overview the typology for REPCs</i>   | 16  |
| <i>Figure 4: Theoretical framework to asses the impact of SO and/or PO support on the<br/>founding process and on the durable collective action capacity of a REPC</i>                     | 39  |
| <i>Figure 5: Foundings of RECs since 2006</i>  | 49  |
| <i>Figure 6: Example for a unified Logo on a REPC website</i>  | 60  |
| <i>Figure 7: Distribution of founding members of the cases</i>   | 64  |
| <i>Figure 8: Forms of support the sample and the control group participants<br/>have received from the municipality (N=7; N=15)</i>  | 65  |
| <i>Figure 9: Comparison of the distribution of the sample and control group survey<br/>participants (N=7; N=15) regarding the number and frequency of internal<br/>contacts</i>            | 68  |
| <i>Figure 10: Comparison of the distribution of the number and frequency of external<br/>contacts</i>  | 68  |
| <i>Figure 11: Comparison of the sample (N=37) and control group (N=38) municipality size</i>   | 72  |
| <i>Figure 12: Comparison of the sample (N=27) and control (N=28) group's installed<br/>PV-capacity in kWh with the national average of REPC installed RE-capacity<br/>in kWh (N=213)</i>   | 72  |
| <i>Figure 13: Distribution of latest RE projects realized by the sample group (N=37)<br/>and the control group (N=32)</i>  | 73  |
| <i>Figure 14: Distribution of active and inactive sample group and control group<br/>REPCs based on their founding year</i>  | 73  |
| <i>Figure 15: Distribution of latest project realized by active sample and control group<br/>REPCs according to their founding year</i>  | 75  |
| <i>Figure 16: Forms of support provided by the VBBW and EnBW Regional AG that<br/>have an impact on the founding process of REPCs in terms of their utility<br/>for the interest group</i> | 109 |
| <i>Figure 17: Forms of support provided by the VBBW and EnBW Regional AG that have<br/>an impact on the founding process of REPCs in terms of their utility for the<br/>interest group</i> | 109 |



# Index of figures

|  |     |
|--|-----|
| <i>Figure 1: Ownership distribution of total installed RE-capacity in Germany 2012<br/>(Total = 72,907 MW)</i>   | 2   |
| <i>Figure 2: Schematic representation of the research</i>  | 7   |
| <i>Figure 3: Overview the typology for REPCs</i>   | 16  |
| <i>Figure 4: Theoretical framework to asses the impact of SO and/or PO support on the<br/>founding process and on the durable collective action capacity of a REPC</i>                     | 39  |
| <i>Figure 5: Foundings of RECs since 2006</i>  | 49  |
| <i>Figure 6: Example for a unified Logo on a REPC website</i>  | 60  |
| <i>Figure 7: Distribution of founding members of the cases</i>   | 64  |
| <i>Figure 8: Forms of support the sample and the control group participants<br/>have received from the municipality (N=7; N=15)</i>  | 65  |
| <i>Figure 9: Comparison of the distribution of the sample and control group survey<br/>participants (N=7; N=15) regarding the number and frequency of internal<br/>contacts</i>            | 68  |
| <i>Figure 10: Comparison of the distribution of the number and frequency of external<br/>contacts</i>  | 68  |
| <i>Figure 11: Comparison of the sample (N=37) and control group (N=38) municipality size</i>   | 72  |
| <i>Figure 12: Comparison of the sample (N=27) and control (N=28) group's installed<br/>PV-capacity in kWh with the national average of REPC installed RE-capacity<br/>in kWh (N=213)</i>   | 72  |
| <i>Figure 13: Distribution of latest RE projects realized by the sample group (N=37)<br/>and the control group (N=32)</i>  | 73  |
| <i>Figure 14: Distribution of active and inactive sample group and control group<br/>REPCs based on their founding year</i>  | 73  |
| <i>Figure 15: Distribution of latest project realized by active sample and control group<br/>REPCs according to their founding year</i>  | 75  |
| <i>Figure 16: Forms of support provided by the VBBW and EnBW Regional AG that<br/>have an impact on the founding process of REPCs in terms of their utility<br/>for the interest group</i> | 109 |
| <i>Figure 17: Forms of support provided by the VBBW and EnBW Regional AG that have<br/>an impact on the founding process of REPCs in terms of their utility for the<br/>interest group</i> | 109 |

## List of Abbreviations

|      |   |
|------|---|
| BWGV | Baden-Württembergischer Genossenschaftsverband              |
| CAA  | Cooperative auditing association                            |
| DGRV | Deutscher Genossenschafts und Raiffeisen Verband            |
| EEG  | Erneuerbare-Energien Gesetz (German renewable energy act)   |
| FIT  | Feed-in tariff  |
| GenV | Genossenschaftsverband e. V.                                |
| GVB  | Genossenschaftsverband Bayern                               |
| GVWE | Genossenschaftsverband Weser-Ems                            |
| NGO  | Non-governmental organization                               |
| PV   | Photovoltaic  |
| PO   | Partner organization  |
| RE   | Renewable energy  |
| REPC | Renewable energy producing cooperative                      |
| REC  | Renewable energy cooperative                                |
| RWGV | Rheinisch-Westfälischer Genossenschaftsverband              |
| SO   | Support organization  |
| VBBW | Verband der BürgerEnergiegenossenschaften Baden-Württemberg |

# 1. Introduction

## *1.1 Problem definition*

Human-induced climate change due to greenhouse gas emissions, particularly emanating from global economic activities, poses one of the major problems the world is facing in the coming decades. Therefore, appropriate mitigation and adaptation strategies to address this issue are urgently needed (IPCC 2007). Two of the major contributors to human-induced climate change that are directly linked to economic activities are the electricity and heating sectors. The generation of electricity and heat, which is mainly based on the combustion of fossil fuels, was the largest producer of CO<sub>2</sub>-emissions worldwide with a total share of 41% in 2009 (OECD/IEA 2011). The major share of the energy production to meet the demand of most European countries is located in centralized large combustion plants based on fossil fuels (Droege 2008). Therefore, it becomes clear that a transition away from fossil fuels to renewable energy as a primary source for economic activity is a key issue in terms of a sustainable development. A widespread realization of small to large-scale renewable energy (RE) generation technologies for heat and electricity production (e.g. solar thermal heating systems, PV-panels, micro wind turbines, RE-base local heating grids etc.) within areas where the energy is needed could significantly contribute to decreasing fossil fuel imports, concomitantly reducing energy dependency and enabling local energy autonomy, on the one hand and to a significant reduction of GHG-emissions related to conventional energy production on the other (Droege 2008; Eicker 2012).

However, the transition towards an energy system based on RE entails major challenges, such as the transition from a centralized to a decentralized energy production and distribution system. In comparison to establishing centralized or mixed energy systems based on renewables, the establishment of a decentralized energy system has several advantages. First of all, it is estimated to be less expensive since expansions of the distribution grid can be limited and the energy is used close to its source, resulting in fewer transport losses (Lepprich et al. 2011; Greenpeace 2005; IEA 2003; Lovins 2002). Secondly, it provides a number of participation opportunities, including private investments and inclusion of local citizens in decision-making processes (Holstenkamp & Degenhardt 2013). Citizen ownership of the local or regional RE-systems or RE-project companies in turn fosters regional monetary cycles, because the profit flow from RE-production and distribution is redirected from large-scale utility companies towards the owners of RE-generation and distribution systems in the locality or region. This especially holds true when the RE-providers and the consumers are located in the same municipality. Moreover, citizen owned electricity and heat production creates additional regional added-value, since local companies<sup>1</sup> usually conduct the on-site construction and the maintenance of the energy systems, which creates jobs and generates lease and tax income for the municipality<sup>2</sup> (Hirschl et al. 2010). Thirdly, a transition towards a decentralized energy system based on renewables holds opportunities of a 'democratization' of the electricity market. Currently 14 major utility companies<sup>3</sup> own and operate the majority of energy production and distribution systems in the EU (Traber & Kemfert 2009). The widespread application of small to large local or regional renewable energy systems for the local energy supply could

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<sup>1</sup> E.g. roofers, electricians etc.

<sup>2</sup> It is estimated that renewable energy generated about € 6.8 billion in regional added value on a

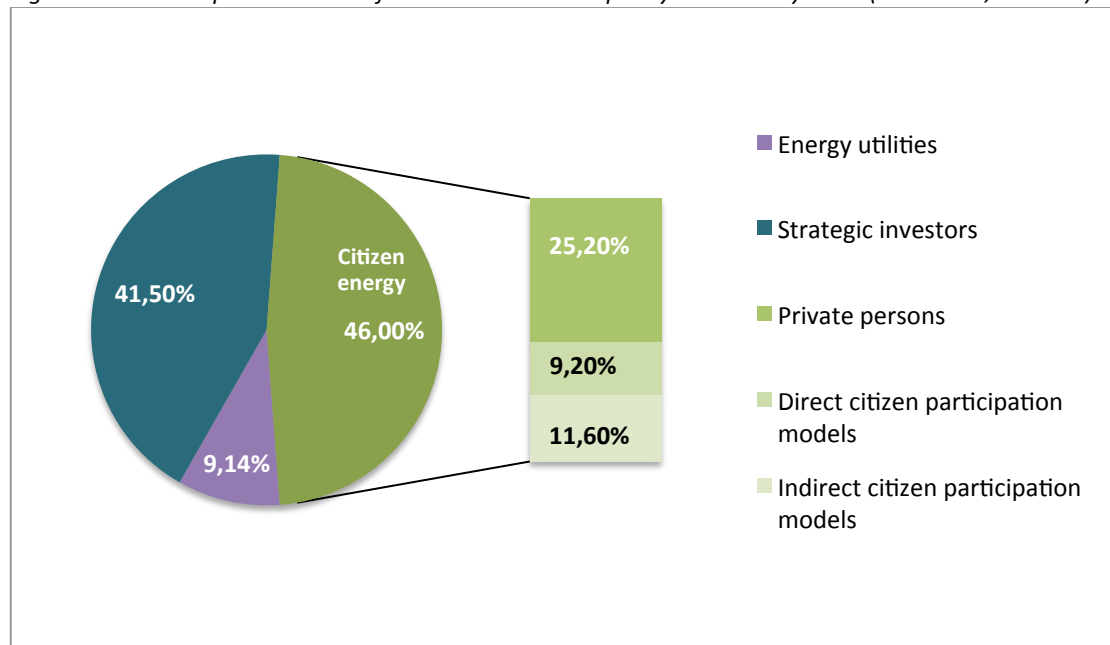
<sup>2</sup> It is estimated that renewable energy generated about € 6.8 billion in regional added value on a municipal level in Germany in 2009 (Hirschl et al. 2010).

<sup>3</sup> Namely: British Energy (UK), EdF (FR), EDP (PT), Enel (IT), E.ON (GER), E.ON (UK), EnBW (GER), Endesa (ES), FNM, Iberdrola (ES), RWE (GER), Suez (BE), and Vattenfall (GER), and Vattenfall (SE).

effectively counter this market dominance and decrease dependencies on the consumer side, since it opens up opportunities for local residents to invest and participate in this decentralizing process (Lovins 2002; Scheer 2005).

One EU-member that has already successfully made the first steps towards such a decentralized energy transition is Germany, which is visible in the total installed renewable energy capacity between 2000 and 2011 and the ownership structure of small to large RE-systems. In Germany, the general investment climate for RE-generation, especially electricity generation, has significantly improved due to the German renewable energy act (Erneuerbare Energien Gesetz, EEG) that was introduced in the year 2000. The main pillars of the EEG are a feed-in tariff system with differentiated tariffs for respective technologies and guaranteed prices per produced kWh for 20 years after the installation of a renewable energy generation system (Hirschl 2008). The impact of the EEG is reflected in the increased shares of renewables in the electricity sector, as the share of renewable electricity rose from roughly 6% in the year 2000 to about 20% in 2011 (BMW 2012). Moreover, the EEG facilitated the wide-spread installment of RE-systems since it opened up opportunities for citizens to realize small-scale private RE-projects or to directly participate in local or regional RE-projects or project companies. This is reflected in the distributions of investments by actor groups in renewable electricity shown in figure 1.

Figure 1: Ownership distribution of total installed RE-capacity in Germany 2012 (Total = 72,907 MW)



Source: (Holstenkamp 2013).

Citizen energy clearly plays an important role in the development of RE-installments in Germany. While 41,5% of the total investments in RE have been made by strategic investors, i.e. banks, insurances, investment companies and RE-project development companies, investments of energy utilities<sup>4</sup> only amounted to 9,14%. Almost half of the investments have been made undertaken by private individuals either through private installments or through jointly investing in local or regional RE-projects with other citizens. Indirect citizen participation models include citizen, customer and employee participations models, where private individuals are only able to provide external capital or mezzanine capital for the project, exclusively coupled to the purpose of receiving a fixed or profit based

<sup>4</sup> This includes all public and private utilities, ranging from locally to internationally operating energy providers.

annual investment return to the private investors, while the majority of equity capital is held by strategic investors. The private investor has therefore no influence on the decision-making process and realization of the project and acts as a silent partner of the strategic investor. In contrast, direct citizen participation models comprise citizen, customer and employee participations models where private individuals can become co-owners with full voting rights through jointly providing at least 50% equity capital for the project or the project company that set up and manages the local or regional RE-project<sup>5</sup> (Holstenkamp & Degenhardt 2013). Research on community energy and citizen participation models in Germany supports the statements above on the benefits of decentralized energy production and distribution system: Majority ownership of small to large RE-projects<sup>6</sup> by local citizens that live in proximity to the systems through direct citizen participation models does not only foster local acceptance but also create more regional added-value, as at least half of profits generated by the RE-system stay within the respective communities (Hielscher et al. 2011; Hirschl et al. 2010; Holstenkamp & Degenhardt 2013; Walker et al. 2010). Accordingly, the majority ownership is also beneficial for the wider community in terms of social and economic sustainability, as direct participation models are generally regionally bound and keep large parts of the value chain within the municipality<sup>7</sup>, which is also beneficial for the municipality in terms of receiving taxes, e.g. trade tax, income taxes etc. (Flieger 2009; Flieger 2011a; Flieger 2011b).

As also observable in figure 1, the opportunity for individuals to directly participate in RE-projects is clearly an important driver of the energy transition in Germany. This is especially reflected in the number of renewable energy cooperatives (RECs) and specifically in the amount of renewable energy producing cooperatives (REPC) that have been founded since 2006<sup>8</sup> and together invested around €1.5 billion in RE-systems. Up to date more than 800 RECs, with a vast majority of REPCs, have been founded in order to use the legal entity of the cooperative as a direct citizen participation model to overcome the barrier of relatively high upfront investment cost for financing local and regional RE-generating systems<sup>9</sup> (DGRV 2014; Maron & Maron 2012). The organization of individuals in the form of a cooperative is especially promising in terms of direct citizen participation, since it promotes self-governance, i.e. self-help and self-administration, member solidarity and a business policy oriented towards sustainable, long-term objectives in the interest of its members (DGRV 2008; Flieger 2011a; Haar et al. 2011; Maron 2009). As cooperatives are deliberately set up and also required by law to pursue environmental and/or social goals next to generating a financial profit for its members, the organization in a cooperative business model can offer an alternative to “the profit expectations of a financial and economic system based on short-term shareholder value interests”(DGRV 2008, p.8; see also Maron 2009).

In comparison to other citizen participation models, cooperatives in the field of RE have several advantages that can facilitate a widespread installation of decentralized renewable energy production systems. Accordingly, local small to medium-sized RE-projects like photovoltaic (PV) rooftop systems and micro hydro with a installed capacity below

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<sup>5</sup> For further definition of the terms direct and indirect citizen participation models see section 2.1.

<sup>6</sup> Small to medium-sized RE-projects include rooftop photovoltaic (PV) systems and micro hydro energy, larger RE-projects include wind turbines, biogas plants, free-standing PV-projects and RE-based local district heating.

<sup>7</sup> E.g. installation by local roofers, production of the generation systems within the municipal borders etc.

<sup>8</sup> The development was at least also partially fostered by an amendment of German cooperative law (GenG 2006) to lower the bureaucratic hurdles for the founding of cooperatives.

<sup>9</sup> For more detailed information on the connection of RECs/REPCs and direct citizen participation models see section 2.1.

1MW, a small dividend<sup>10</sup> and long-term return rate to recover the initial investments are most suitably realized within a participative business model like the cooperative, as the main focus lies on sufficing member utility rather than increasing short-term shareholder value (Flieger 2011b; Holstenkamp & Ulbrich 2010). This member utility is reflected in the goals of the cooperative as stated in the code of conduct that the general assembly agreed upon in the founding event and that every member has to sign before he or she can join the cooperative. Moreover, small to medium-scale projects are less demanding in terms of project realization and management, which accommodates the fact that most active members in a REC are constrained by time, since most of them work on a voluntary basis<sup>11</sup> in the early years of the business (Volz 2013). The relatively low rate of return of small to medium-sized RE-projects, providing only a relatively small dividend for members, often does not allow for a professional management board of the cooperative. Therefore, durable collective action plays an important role in the establishment and the further development of a REPC, as not only the establishment but also the mere functioning of a REPC usually depends on voluntary work conducted by its active members and its goals cannot be achieved without a concerted group effort (Olson 1965).

However, despite the potentials of REPCs for direct citizen participation, this form of engagement – like other environmental initiatives – often faces a problem that is depicted as the ‘value-action gap’, since the establishment and management of the organization in the early years usually depends on voluntary work by its active members. The value-action gap describes a phenomenon identified by environmental/sustainable behavior research that although people value environmental/sustainable behavior they often do not take action to act accordingly. This gap may be based on individuals’ priorities and attitudes as well as on the institutional and social context for action (Barr 2004; Blake 1999; Lorenzoni et al. 2007). In relation to energy issues van der Horst (2007) discovered that even with a high awareness for energy-related environmental problems, only few people are willing to mitigate these problems by making a significant change in their lives. In an attempt to further the research on this phenomenon Rogers et al. (2008) discovered in a study undertaken in the rural community of Thirlmere (UK) that most people are willing to engage in ‘low-level participation’ in a local renewable energy project, such as taking part in public meetings or being included in the decision about pre-identified options for renewable energy technology. Nevertheless, ‘high-level participation’, such as helping to initiate and control the project was less favored often due to lack of confidence in their own abilities to do so. As other collective action initiatives, many REPCs also struggle with amateurism, i.e. they lack the knowledge and skills to adapt to changing policy context and to diversify their energy portfolio, that can impair the durability of collective action undertaken by active members, i.e. the identifying project opportunities and realizing local or regional RE-projects through joint collective action of the active members.

Drawing on concepts from strategic niche management, Hargreaves et al. (2013) argue on the basis of an in-depth analysis of intermediary work in the community energy sector<sup>12</sup> of the United Kingdom, that intermediary actors can play an important role in initiating and strengthening of local and regional RE-initiatives through different forms of support, depending on capacities of the respective intermediary organization. Accordingly, intermediaries may include national to local government agencies, non-governmental organizations (NGOs) and market actors (Hargreaves et al. 2013).

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<sup>10</sup> For example the average dividend for renewable energy producing cooperative members in Germany averages around 3.99%, ranging from 0,8% up to 7% (DGRV 2013a).

<sup>11</sup> In Germany over 94% of active members in REPCs, that have been founded in the last years, work on a voluntary basis (Volz 2012).

<sup>12</sup> This includes direct and indirect citizen participation models as well as private installments by individuals, i.e. citizen energy as depicted in figure 1.

Although Hargreaves et al. (2013) identify general forms of support that can potentially be offered to community energy projects, it does not clearly provide what precise forms of support are useful for both the founding of a local RE-initiative and to foster the durable collective action capacity of active members, i.e. ongoing capacity of active members to engage in collective action in form of a REPCs<sup>13</sup>. In Germany, various intermediary organizations are present that provide several support mechanisms to the founding process and durable collective action capacity of REPCs. These include local governmental agencies, market actors and REC associations and are here distinguished into partner organizations (POs) and support organizations (SOs), based on the primary purpose of the intermediary organizations and on their respective motives to support the interest group and later the REPC. SOs in the context of REPCs are therefore general cooperative associations and REC associations, whose primary purpose is to foster the development of cooperatives and that cannot invest in the REPC. Accordingly, POs primary purpose is not coupled to the REPC and the POs can follow their own respective motives to support a REPC, e.g. image-building, future investment opportunities etc.

Considering the intricacies in initiating and sustaining collective action, it appears that the support provided by these intermediaries is crucial for the founding and durable collective action capacity of REPCs. However, scientific and, to a lesser extent, practical insights on the actual impact of the support provided in terms of the extent to which it contributed to the founding process and durable collective action capacity are thus far largely missing. Such knowledge could provide additional conclusions on needs of REPCs and contribute to enhance support provision. Additionally, it might reveal the intentions of different intermediary organizations in support provision and the therewith-related support provisions. Such insights on possibilities for supporting the RE-transition in relation to direct citizen participation appear increasingly relevant when considering the problems of climate change, the benefits of decentralized RE-systems and the challenges relating to the value-action gap.

This research will contribute to closing this knowledge gap by analyzing REPCs in South Germany, more specifically from the federal states of Baden-Württemberg and Bavaria. This analysis includes a comparative study of REPCs that received support by intermediary organizations and REPCs that received no such support. More specifically, the research will focus on the support concept of two intermediary organizations, namely the REC association Verband der BürgerEnergiegenossenschaften Baden-Württemberg (VBBW) and the EnBW Regional AG<sup>14</sup>. The main research focus lies on REPCs that started out with PV-projects and that are still mainly based on PV-projects, to ensure comparability of the cases that did and did not receive support from an SO or PO, as it poses the most feasibly realizable technology for laymen and since PV-REPC make the largest share of REPCs in Germany (Flieger 2011b, Staab 2013b). On this basis, this research aims to identify the relevant forms of support that are most useful for interest groups, i.e. groups of citizens interested in founding a REPC, in the founding process of a REPC and the relevant forms of support that are most useful to foster the durable collective action capacity of active REPC members. This research will hence contribute to the understanding of the needs to initiate and sustain RECs and seeks to identify support possibilities to further a decentralized energy transition.

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<sup>13</sup> As Hargreaves et al. (2013) do not focus on a specific organizational model for community energy projects, only general forms of support are identified but not assessed according to their utility for the active members, as the single forms of support vary, depending on the organizational form of the initiative.

<sup>14</sup> A subsidiary of the internationally operating energy utility EnBW AG.

## *1.2 Research objective and research questions*

Following the approach suggested by Verschuren and Doorewaard (2010), the objectives of this research will be presented according to the kind of knowledge that they seek to produce. In general, this research is practice-oriented in that its results are meant to provide practical information for interested individuals, who want to establish a REPC in their community and who are considering to establish it on their own or to collaborate with an intermediary organization. Accordingly, the research aims to identify and analyze the impact of specific forms of support provided by intermediary organizations on the establishment of a REPC and its impact on the durable collective action capacity of a REPC.

The first objective is to provide descriptive knowledge by defining intermediary organizations and forms of assistance they provide in the founding process and for strengthening the durable collective action capacity of a REPC as well as identifying relevant intermediary organizations in Germany and the forms of assistance provided by them. Secondly, this research aims to produce explanatory knowledge by establishing if and how these forms of assistance influence the founding process of a REPC and its durable collective action capacity. The third objective is to provide evaluative knowledge by assessing which forms of assistance have the most significant impact on the establishment and the durable collective action capacity of a REPC. The last objective is to provide prescriptive knowledge for potential founders as well as active members of REPCs and intermediary organizations on adverse or beneficial effects regarding intermediary organizations' support. This prescriptive knowledge will be based on the results that are to be obtained by completing the preceding research objectives.

In line with the above, the main research question this research seeks to answer is as follows:

*What impact has the involvement of a intermediary organization on the establishment of a renewable energy producing cooperative (REPC) and the durability of collective action undertaken by the active members of the cooperative?*

The main research question is divided into a set of sub-questions. Answering the following sub-questions will contribute to answering the main research question:

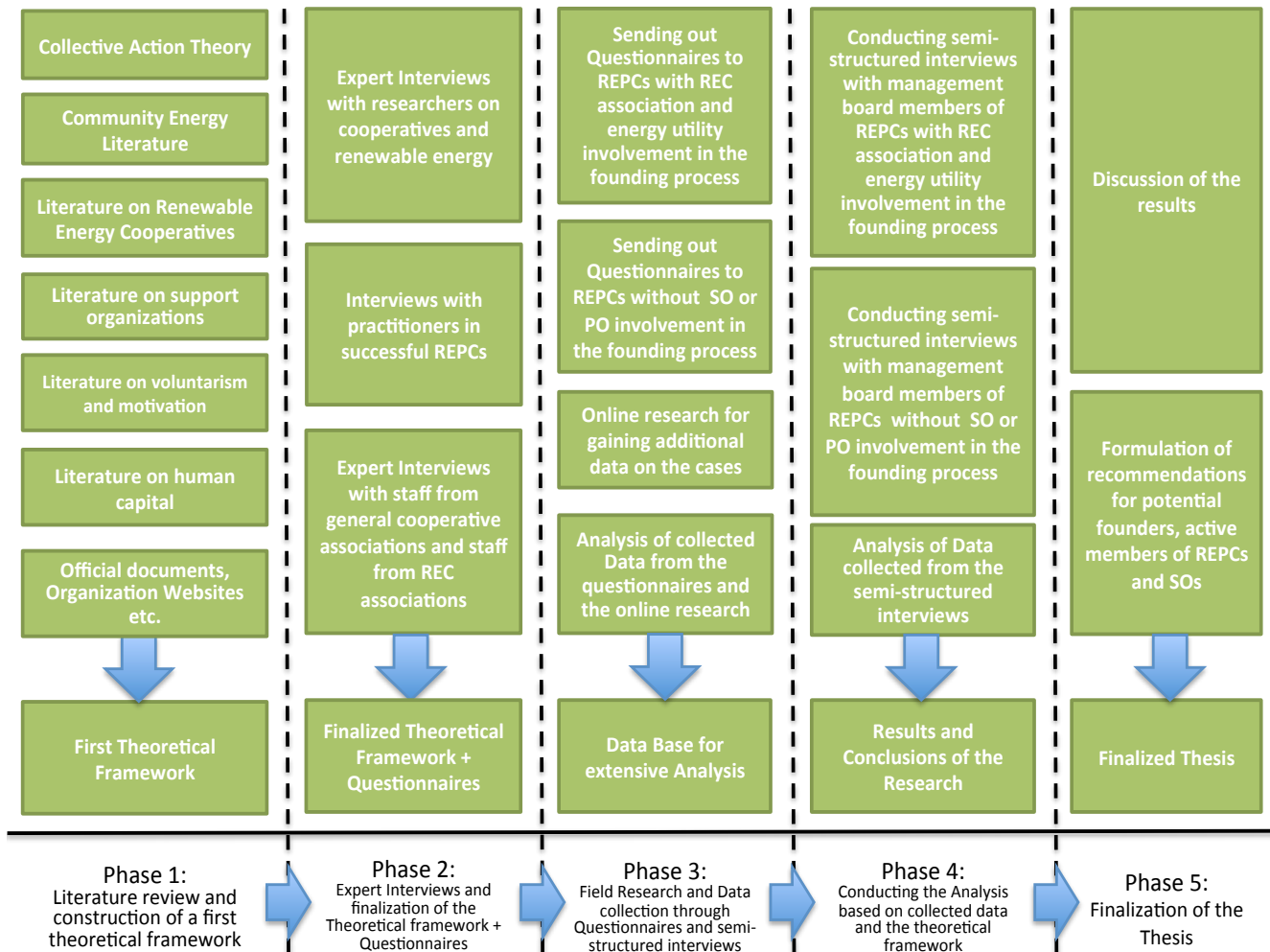
- What are the relevant intermediary organizations for REPCs?
- What forms of assistance exist to support the founding process of a REPC?
- What forms of assistance exist that are aimed to foster the durable collective action capacity of the active members in a REPC?
- What forms of assistance have an influence on the establishment of a REPC?
- What forms of assistance have an influence on the durable collective action capacity of collective action undertaken by active members?
- What recommendations for potential founders, REPCs and municipalities can be given in terms of adverse or beneficial effects of intermediary organization involvement?



### 1.3 Research framework

According to Verschuren and Dooreward (2010) the research framework should reflect the research objective and include the appropriate steps necessary to achieve it. Figure 2 gives an overview of these steps, which will be described in the following.

Figure 2: Schematic representation of the research



Phase 1 of the research consisted of desk research and a literature review in order to conceptualize the founding process and the durable collective action capacity of REPCs. Moreover, it helped to conceptualize support organizations (SOs) and partner organizations (POs), two forms of intermediary organizations providing support to REPCs, and the forms of support they provide that are likely to have an impact on the founding process and the durability of collective action capacity of REPC. Due to the sparse literature on REPCs, various strands of literature have been used to construct a first draft for a theoretical framework. Literatures on collective action and collective action organizations<sup>15</sup>, community energy<sup>16</sup> and renewable energy cooperatives<sup>17</sup> were useful to identify REPCs as direct citizen

<sup>15</sup> See for example Knoke (1990); Olson (1965).

<sup>16</sup> See for example Bolinger (2001); Enzensberger et al. (2003); Hargreaves et al. (2013); Hirschl et al. (2010); Hoffman & High-Pippert (2005); High-Pippert (2010).

<sup>17</sup> See for example Flieger (2008; 2011a); Herlinghaus et al. (2008); Holstenkamp (2012); Holstenkamp (2013); Maron (2009); Maron & Maron (2012); Theurl (2008); Volz (2012).

participation models and to construct a typology for REPCs. Start-up literature<sup>18</sup> on REPCs helped to conceptualize the founding process as a project with four phases that include a number of given tasks that need to be fulfilled through collective action of the interest group in order to establish a REPC. Durable collective action capacity of a REPC is identified to be determined by the available human capital, organizational strength and the intrinsic and extrinsic motivation of active members. The concept of human capital in a REPC is based on articles by Schultz (1961), Becker (1962) and Benhabib and Spiegel (1994) that define the term human capital in the context of private corporations. In order to translate the concept of human capital into the context of voluntarily operated REPCs, it is assumed in this research that the human capital in REPCs is determined by the management capacity of active members, the organizational strength and the connection of active members to other members or members of other REPCs. All three variables and their respective indicators are based on an article by Barnes and van Laerhoven (2013) that researched the influence of external agents on joint forest management initiatives in Maharashtra (India), and identified several indicators for the functioning and the durability of collective action that could also be used in the context of this research. The basic conceptualization of intrinsic and extrinsic motivation is mainly derived from article by Ryan & Deci (2000) on basic motivations of individuals to fulfill personal and work related tasks. Based on a study by Verba et al (1995) on voluntarism in American politics and two articles by Hoffman and High-Pippert (2005; 2010) on motivations of individuals to voluntarily engage in community energy projects, the intrinsic motivation of active REPC members to stay engaged in their collective action is sought to be determined by the civic and social gratification that active members perceive to gain from their voluntary engagement. Extrinsic motivation on the other hand is sought to be determined by confidence in future benefits (Barnes and van Laerhoven 2013) and the and the presence of, or plans to implement a non-monetary incentive system, since no financial incentives can be offered to volunteers in early years of the REPC. The conceptualization of SOs and POs and their respective forms of support are based on an article by Brown and Kalegaonkar (2002) on the role of SOs in NGO-based civil society action and an article by Hargreaves et al. (2013) on the role of intermediary organizations in initiating and strengthening local RE-initiatives. In its basic structure the first draft of the theoretical framework is identical to the final theoretical framework, the latter however contains additional variables that have been added at the end of phase 2 of the research when fed with the analysis of expert consultations on PO and SO support.

In phase 2 of the research, semi-structured interviews with open questions were held with REPC experts<sup>19</sup> and practitioners in successful REPCs<sup>20</sup> and intermediary organizations' staff members<sup>21</sup>, in order to complement the theoretical framework and to ensure that the identified variables from the literature review were suitably translated into the context of REPCs. The interviews were transcribed, analyzed and coded on the basis of the preliminary theoretical framework. Existing variables and indicators were amended and additional variables and indicators were added. All variables were operationalized in order to construct the final theoretical framework. Subsequently, two questionnaires were crafted, one for REPCs with SO and PO support and one for REPCs without. All questions are based on the dependent variables and their specific indicators for the respective sub-variables. The finalization of phase 1 and 2 helped to gain a general overview on types of REPCs as well as types of SOs and POs and respective forms of support. Moreover, they helped to identify and construct variables and indicators that determine the collective action capacity of a REPC and the founding process of a REPC.

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<sup>18</sup> See for example George & Berg (2013); Flieger (2009); Kaiser & Steinle (2013); Staab (2013a).

<sup>19</sup> See for example Flieger (2013b); Staab (2013b).

<sup>20</sup> See for example Behr (2013); Elpers (2013); Kühn (2013); Voigt (2013).

<sup>21</sup> See for example Gottwald (2013); Janik (2013); Strobel (2013).

In phase 3 the questionnaires were sent out to respective REPCs. Three month after the first e-mail was sent the questionnaire was closed and the results were analyzed and compared to another. Firstly, this helped to get an overview on how the different REPCs assessed the difficulty to conduct the necessary tasks to reach the goals in the different phases of the founding process and where and to which extent SO and PO support proved to be useful. Secondly, it provided general insights on the different REPCs' Durable collective action capacity. While waiting for responses, additional data collection was undertaken to gain insights on the latest activity of the potential cases. The online research on the potential cases helped to gain insights on the recent activities in terms of latest project realizations and could be used to back up the insights gained from the questionnaire results<sup>22</sup>.

On the basis of the questionnaire results semi-structured interviews with open questions were held with four selected participants in phase 4, i.e. two representative founding and management board members of institutional-organizational REPCs and two representative founding and management board members of a civic-ecological and a socio-political REPCs that participated in the survey. The semi-structured interviews provided insights into why REPCs with and without intermediary organizations' support had difficulties or found it easy to conduct the founding process and the related tasks and why they scored relatively high or low in terms of human capital, intrinsic and extrinsic motivation. Additionally, insights could be gained on the utility of specific forms of support provided by the REC association and the energy provider, that fostered the conducting of the founding process and durable collective action capacity of the institutional-organizational REPCs.

In the last phase, the thesis was finalized with a discussion of the results and recommendations for potential founders, active members of REPCs and SOs were identified based on the results of the foregone analysis.

## *1.4 Scientific and societal contribution*

### **1.4.1 Scientific relevance**

Scientific research on REPCs in general and the role of intermediary support organizations in particular is sparse. It does so by identifying direct participation models, defining REPCs and conceptualizing both support mechanisms of intermediary organizations and conditions for the founding process and the durable collective action capacity of REPCs. This research contributes to the scientific literature on community renewable energy (Hielscher et al. 2011; Hoffman & High-Pippert 2005; 2010; Holstenkamp 2013, Rogers et al. 2008; Walker 2008; Walker et al. 2010; Walker & Devine-Wright 2008) and more specifically to research on direct citizen participation models such as REPCs (Holstenkamp & Degenhardt 2013). It also contributes to the small but growing literature on RECs and their role in local energy transitions (Flieger 2011a; Flieger 2011b; Maron 2009; Maron & Maron 2012; Holstenkamp 2012; Holstenkamp 2013; Holstenkamp & Müller 2013; Holstenkamp & Ulbrich 2010; Theurl 2008). Moreover, it adds to the sparse literature on the role of intermediary organizations in RE-grassroots initiatives (Hargreaves et al. 2013), as it offers in-depth insights on intermediary organizations' support and its utility in the founding process and the further development of REPCs. Lastly, the theoretical framework can be used to identify and research the impact of intermediary organization involvement in the founding process and on the collective action capacity of a REPC in other countries, with respective adaptations according to the national RE-support policy and specific legal context in which cooperatives operate.

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<sup>22</sup> The data has been updated in March 2014 to see if projects have been realized or planned in 2014.

### **1.4.2 Social relevance**

As indicated in the problem definition, REPCs can provide a useful tool to foster a decentralized energy transition through the installation of small to medium-scale renewable energy generation systems. As this has been argued to be highly desirable, the obtained results on the role of support provided by intermediary organizations to foster the establishment and the collective action capacity of REPCs can help to shed light on how the afore-mentioned value-action gap in community energy projects (Rogers et al 2008) can be partially overcome through the involvement of intermediary organizations. These insights may especially be useful for local interest groups and local government agencies in rural areas in Germany that want to foster the installment of local or regional RE-systems through direct citizen participation models, but can also be partially transferred into a larger municipal context.

### **1.4.3 Connection to the Environmental Governance (EG) Track and the Copernicus Institute**

This research has both strong connections to the content of the study program and the research program of the Copernicus institute. It draws heavily on knowledge obtained in a number of courses such as the transition of the economic sectors towards a sustainable development ('governance for sustainable development practices' course), theoretical approaches learned in the 'governance for sustainable development theories' course and last but not least methodological approaches ('advanced research methods' course). With the main focus on the impact of intermediary organization assistance on the founding process and the durable collective action capacity in the context of REPCs, the research focuses on a collective action arrangement that can foster a transition towards a sustainable development, which is in line with the research program of the Copernicus Institute (Copernicus Institute 2014). As the research aims to give recommendations to both civil society and the public sector on what forms of support foster or hinder the initiation and the expected durability of CA in the context of REPC, it ultimately may help to contribute to finding alternative pathways to realize a collective goal in a participative manner, namely the transition towards an energy system based on sustainable energy in the hands of civil society (Copernicus Institute 2014).

## *1.5 Outline of the thesis*

The remainder of the thesis is divided into the following chapters, which altogether inform the final answer to the research question. Following this introduction, the second chapter introduces the theoretical background of this research. This includes the definition and categorization of REPCs as well as the definition and conceptualization of the founding process and the durable collective action capacity of REPCs. The latter form the dependent variables; they are hypothesized to be influenced by the support provided by intermediary organizations, which thus relates to the independent variables. To define and conceptualize the independent variable intermediary organizations' support, intermediary organizations are first defined and then categorized into SOs and POs. These will be described in terms of their founding concepts, actors and goals. The identification and conceptualization of the forms of support provided by SOs and POs, respectively, enables to eventually draw up the theoretical framework that visualizes the dependent and independent variables and their hypothesized relations. The third chapter moves on to describe the methodology, including

research strategy, case selection, data collection and operationalization and measurement of the variables. The fourth chapter provides the background for the case study analysis in form of the German RECP context. It includes a description of the specifics of the German legal context, i.e. cooperative law and RE-support, as well as policy context in which REPCs operate. Additionally, the relevant SOs and POs operating in Germany are introduced. In particular, the SO VBBW and the PO EnBW Regional AG and their support concept are introduced. The fifth chapter contains the analysis of the support provided by the SO and PO under investigation, as well as of the founding process and durable collective action capacity of the REPCs in the case studies. The sixth chapter is dedicated to the discussion that reflects on the contributions, validity and limitations of this research and gives indications for further research. The thesis ends with final conclusions and the responses to the research questions in chapter 7.

## 2. Theoretical part

In this section the theoretical framework will be constructed that enables the assessment of what impact intermediary organization support has on the founding process and the durable collective action capacity of a REPC. First of all, general background on renewable energy cooperatives (RECs) will be provided. On the one hand, it is described as a concept of citizen participation and its connection to the general characteristics of the cooperative organizational structure and its business model will be presented to provide generic insights into the specifics of this organizational model. On the other hand, a typology for renewable energy cooperatives (RECs) is proposed in order to define the term renewable energy producer cooperative (REPCs), as the main focus in this research lies on the latter. Secondly, to be able to assess the impact of the independent variable 'intermediary organizations' support' on the dependent variables of RECP 'founding process' and the 'durable collective action capacity' are conceptualized. The founding process is conceptualized as a project with different phases. Accordingly, the founding process consists of an orientation phase, planning phase, founding phase and project phase, during which respective sub-goals need to be realized to successfully establish a REPC and its first RE-project. This way it can be differentiated on which phase and respective achieved goal the SO and/or PO support had an impact. Subsequently, the durable collective action capacity of active REPC members will be conceptualized as consisting of three main variables, namely the human capital of active members and their intrinsic and extrinsic motivation to participate in a REPC in the long-term.. Lastly, in order to precisely see what forms of intermediary organizations' support had an impact on the founding process and the durable collective action capacity of a REPC, intermediary organizations are defined and categorized and their respective (potential) forms of support are outlined.

### *2.1 Background on renewable energy cooperatives*

This section introduces REPCs in terms of the cooperative business model as citizen participation model that aims to realize local and regional renewable energy projects. Accordingly, considering the many benefits of direct citizen participation in contrast to indirect citizen participation, first the cooperative business model is described generally and specifically with regard to RECs and REPCs. Subsequently, a comprehensive typology of RECs and REPCs is constructed, positioning it within collective action organizations. The typology distinguishes REPCs further in institutional-organizational REPCs, civic-ecological REPCs and socio-political REPCs. This enables to divide into REPCs that receive support by intermediary organizations and REPCs that do not. By this, this section builds the foundation for an in-depth analysis of the influence of intermediary organizations' support on REPCs.

#### **2.1.1 The cooperative business model as a citizen participation model to realize local and regional renewable energy projects**

As pointed out in the introduction, citizen participation models can have adverse positive effects on the acceptance and installation of local or regional RE-projects. In the following, an overview on the cooperative organizational structure in the context of citizen participation models will be given in order to highlight advantages of this organizational model in terms of direct citizen participation in realizing local RE-projects. Following Holstenkamp and Degenhardt (2013), the term citizen participation is here separated by differentiating between direct and indirect citizen participation in energy projects, on the

basis of criteria derived from governance-, finance- and corporate law-perspectives<sup>23</sup>. It is based on the hypothesis that the inclusion of local citizens through direct financial participation as well as inclusion in the decision-making and controlling of RE-projects or RE-project companies positively affects the acceptance and willingness of local citizens to at least financially participate in small to large, local or regional RE-projects (Hargreaves et al. 2013; Hielscher et al. 2011; Holstenkamp & Degenhardt 2013; Walker et al. 2010).

*Direct* citizen participation in RE-projects is defined by the following criteria: a) equity capital for the project or the project company that manages the project is provided by citizens; b) those citizens live in the locality or region where the project is realized; c) low entrée fees as participation should be potentially open to anyone in the locality or region and high entrée fees generally inhibit participation of citizens that are less affluent; d) investments of participants are not exclusively coupled to financial profit but also to foster the common welfare of the community; e) citizens as participants can directly take part in important decisions and have control rights over the actors or the project company that manages the day-to-day business for the project; and f) at least 50% of the project(s) or the project company that manages the project(s) is owned by citizens that live in close proximity to the project(s) (Holstenkamp & Degenhardt 2013). Direct citizen participation models therefore include citizen, customer and employee participation models where private individuals can become co-owners through jointly providing at least 50% equity capital for the project or the project company that is set up to realize and manage the RE-project(s). Citizen participation models include local or regional companies that are founded, managed and controlled by local citizens to realize local or regional RE-projects. Customer participation models relate to public utilities or local banks offering citizens to directly invest in local or regional RE-projects. Employee participation models are organized by employees or offered by a large company to give employees an opportunity to invest in RE-projects related to the company.

In contrast, *indirect* citizen participation models include citizen, customer and employee participations models where private individuals are only able to provide external or mezzanine capital for the project, exclusively coupled to the purpose of receiving a fixed or profit based annual investment return to the private investors. In this form of citizen participation the majority of equity capital is held by partner organization, e.g. public and private utilities, banks, RE-project development companies etc. Therefore, the local citizens have no opportunity to influence important decisions, as partner organizations realize, manage and control the project or project company. Along with Holstenkamp and Degenhardt (2013) it is argued here that public utilities that realize, own and operate local or regional RE-projects constitute a form of indirect citizen participation, since the private individual cannot directly invest in the project or project company. Private individuals' interests are thus only represented through the public utility. This however poses a problem when the interest of the community is not congruent with the interest of the public utility.

According to the definition of citizen participation models, REC and REPCs can clearly be identified as direct citizen participation models. The International Labour Association (ILO) defines a cooperative as "an autonomous association of persons united voluntarily to meet their common economic, social, and cultural needs and aspirations through a jointly-owned and democratically-controlled enterprise" (ILO 2002). The organizational structure of a cooperative ensures democratic control of the business and inclusion of members on important decisions regarding the future development of the enterprise. It comprises (a) a general assembly that includes all members and is the ultimate authority in the organization; (b) a management board that representatively manages and operates the cooperative and

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<sup>23</sup> Due to the scope of this research a full representation of these perspectives would not be feasible. For further details on the theoretical construction of the term citizen participation in RE-projects see Holstenkamp & Degenhardt (2013).

its assets in practice; and (c) an advisory board that controls the management board, the advisory board consists of members that have been elected by the general assembly. The management board consists of members that have been appointed by the advisory board. As opposed to other legal entities, where the management and advisory board can also include agents appointed by principals that own the company, only members of the cooperative can be elected into the advisory and management board. General decisions on the code of conduct, including the general business model and the future development of the cooperative, can only be made by the general assembly based on a one-member-one-vote principle. Notably, the voting power of a member is independent from the amount of shares they acquired. However, the management and advisory board independently make decisions regarding the operative business. If not stated otherwise in the code of conduct, natural as well as legal persons can become members of a cooperative. The number of potential participants is unlimited and the contribution to participate in a cooperative, i.e. the minimum share that needs to be bought, is often quite low<sup>24</sup> to enable participation of a wide range of actors, regardless of their personal income (Flieger 2009; 2011a; 2011b).

### **2.1.2 A typology of renewable energy cooperatives**

One of the problems that comes with a relatively new phenomena such as energy cooperatives or more specifically REPCs is the lack of a widely agreed upon definition of the terms<sup>25</sup>. While some authors try to distinguish between different types of energy cooperatives based on their position in the value chain (Flieger 2008; 2009; 2011a; Kaehlert 2013; Theurl 2008) and their strategic orientation (Flieger 2009; Kaehlert 2013), other authors differentiate them based on the energy source and the form of energy they are dealing with, i.e. heat or electricity (Herlinghaus et al. 2008; Froschmeir & Haffmanns 2009). To be able to distinguish, compare and analyze different REPCs in this research, a small typology of energy cooperatives and specifically REPs will be constructed in the following.

First of all, a cooperative can be classified as a collective action organization<sup>26</sup>. Collective action plays an important role in the establishment and the further development of a cooperative, as its mere functioning often depends on voluntary work conducted by its active members, and the goals of the cooperative cannot be achieved without a concerted group effort (Olson 1965). Active members are here defined as members who are actively involved in the pursuit of the respective goals of the cooperative, i.e. the management and the advisory board members and other members that actively contribute their human capital to operate the cooperative. The term human capital<sup>27</sup> refers to the productive capacity of individuals operating in an economic setting that is determined by their skills and knowledge (Schultz 1961). According to Olson's (1965) understanding of organizations, a cooperative is here interpreted as an organization that has the purpose of furthering the interests or objectives of its members. It can clearly be classified as a collective action organization, since it (1) seeks non-market solutions to particular individual or group problems, (2) maintains formal criteria for membership on a voluntary basis, (3) may employ persons under the authority of organizational leaders, and (4) provides formally democratic procedures to involve members in policy decisions (Knoke 1990). This is also applicable for cooperatives in the field of energy.

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<sup>24</sup> In a REC in Germany the average minimum share is around €692, ranging from a share as low as €10 up to €3.000. Around 86% of the RECs require a minimum share lower than €1.001 and 65% of the RECs require a minimum share lower than €501 (DGRV 2013).

<sup>25</sup> For further information see Holstenkamp (2012).

<sup>26</sup> Other examples for collective action organizations are trade associations, labor unions, self-help groups etc. (Knoke 1990).

<sup>27</sup> For further discussion see section 2.4.1.



A renewable energy cooperative (REC) is a direct citizen participation model for private individuals to engage in decentralized renewable energy generation or renewable energy provision<sup>28</sup> (Holstenkamp 2013). Following Holstenkamp's (2012) broad definition of energy cooperatives, a REC is here defined as (1) a registered cooperative (2) that defines a pursuit along a value chain<sup>29</sup> in the renewable energy sector<sup>30</sup> (3) which is economically relevant for the organization and/or plays an important role for its members regarding the specific obligations of the organization towards its members. Accordingly, renewable energy cooperatives (REC) seek to offer opportunities for individuals to invest in and benefit from the renewable energy sector. Based on Flieger's (2008; 2009; 2011a) typology of energy cooperatives, RECs can be grouped into (1) renewable energy service cooperatives<sup>31</sup>, (2) renewable energy consumer-producer cooperatives<sup>32</sup>, (3) renewable energy producer cooperatives, and (4) renewable energy consumer cooperatives<sup>33</sup>. Although the other types of RECs are important to get an overview to differentiate between general types of RECs, they will not be elaborated further at this point, since the focus in this research lies on REPCs and the role intermediary organizations' assistance.

In order to be able to compare different types of REPCs, a further distinction is made, based on their goals and their involvement with intermediary organizations. In line with Flieger's (2008; 2009; 2011a;b) distinction of different PV-cooperatives<sup>34</sup>, three different types of REPCs can be distinguished based to their specific goals and their involvement with intermediary organizations: (1) civic-ecological REPCs, (2) socio-political REPCs and (3) institutional-organizational REPCs. For an overview see figure 3. The green boxes indicate the concepts mentioned in the text, the red-circled box highlights the research focus and the blue boxes represent the concepts that are disregarded and not further developed here, since they are out the research scope.

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<sup>28</sup> By jointly buying electricity and heat from renewable energy producers for their members. See for example Greenpeace Energy (2013).

<sup>29</sup> This includes research and development; production of components and energy production systems; setting up production systems; operation of energy production systems; distribution of energy systems and the financing through propriety capital and outside capital.

<sup>30</sup> The renewable energy sector includes the production, transmission, distribution or trade with renewable electricity, heat and/or fuels.

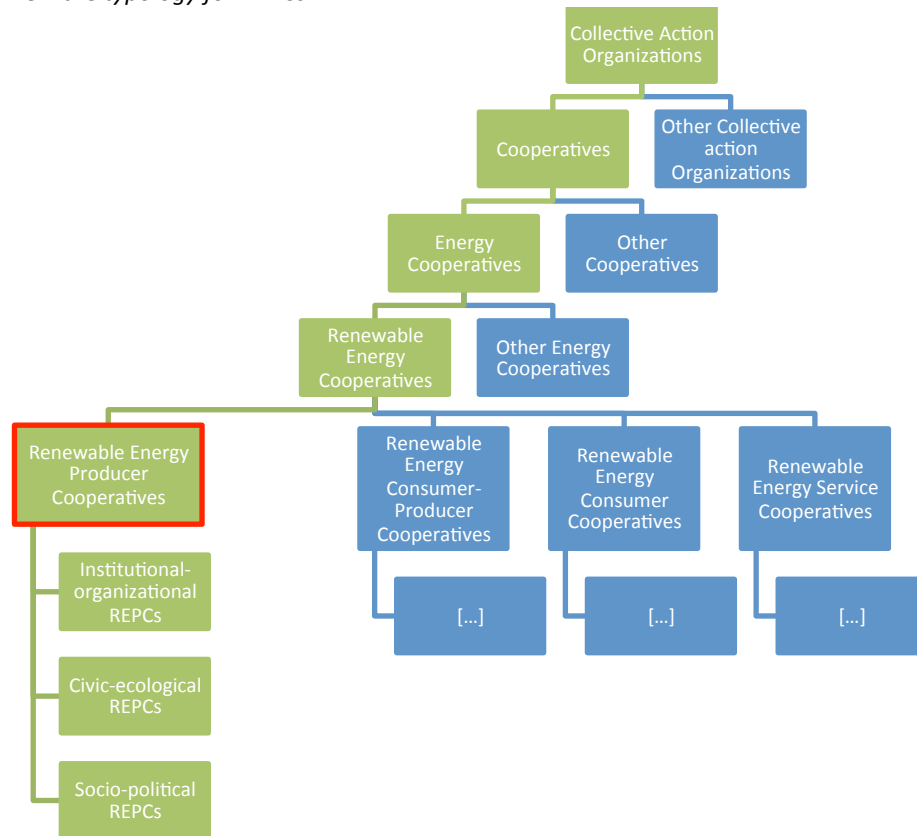
<sup>31</sup> This includes consultancy cooperatives, purchasing and supply cooperatives, cooperatives to secure a sustainable energy supply and fields of work such as cooperation in order procurement and distribution for its members.

<sup>32</sup> A good example for this are the so called bio energy villages in Germany, where a large part of the village community jointly operates a local bio energy plant and heating grid via a cooperative as a business form to meet their own energy demand.

<sup>33</sup> Above all renewable energy consumer cooperatives are involved in trading and distributing energy to its members and other consumers. They are usually established in a situation when consumers are not satisfied with the provision of energy based on fossil fuels and demand a sustainable energy supply based on renewables. A good example for this is the Greenpeace Energy e.G. (Flieger 2008).

<sup>34</sup> Flieger (2008; 2009; 2011b) refers to them as PV-cooperatives in his typology, since the majority of REPCs in Germany started out with PV systems to produce renewable electricity, the concept can be transferred to REPCs as a more general term, since his distinction of the different types of cooperatives was not based on technology in the first place.

Figure 3: Overview the typology for REPCs



Institutional-organizational REPCs are founded by or in very close cooperation with intermediary organization, i.e. a cooperative association and/or a partner, e.g. a bank, a public or private utility company or a municipality. As already mentioned in the introduction, intermediary organizations are here distinguished in support organizations (SOs) and partner organizations (POs)<sup>35</sup>, depending on their primary task and motives to support the REPC. Generally speaking, intermediary organizations can potentially assist in conducting crucial tasks in the founding process and the development of the cooperative. In some cases POs take very proactive approaches, by actively founding the REPC as a member and assuming the operation and management of the cooperative. This is usually realized by staff members of the POs, that become members and get elected into the management or advisory board of the REPC (Energiewende Jetzt 2013a; Flieger 2013a; Gottwald 2013; Janik 2013). Although ecological and social concerns also may play a role in establishing an institutional-organizational REPC, the organization's primary goal in comparison to the other types of REPCs is profit maximization for its members through quick professionalization (Flieger 2009, 2011a). An institutional-organizational REPC is here defined as a REPC that has been founded by or in close cooperation with a SO and/or and aims at setting up renewable energy production systems for the benefit of their members.

Civic-ecological REPCs are usually founded by members of civil society, engaged in or with an interest in ecological or energy policy issues. Although the initiators of this type are usually highly informed and often have very subject-specific knowledge, they cannot draw on resources from third parties for the founding process and further development of their REPC in the same manner as institutional-organizational REPCs. The implementation of the founding process therefore necessitates a high level of commitment in terms of voluntary,

<sup>35</sup> Flieger (2009; 2011b) does not distinguish between SOs and POs and simply labels both types as *strong partners*.

unpaid engagement in collective action by its participants. The engagement of other citizens in renewable energy issues and creating opportunities for citizens to participate in a sustainable and local renewable energy production are often the primary goals (Flieger 2009, 2011a). A civic-ecological REPC is here defined as a REPC that has been independently founded by local citizens and aims at setting up renewable energy systems not only for the benefit of their members but also to support civic-ecological causes.

Socio-political REPCs are usually quite similar to civic-ecological REPCs with the exception that the founders are usually not primarily interested in ecological concerns but in social or international development issues. This encompasses a wide spectrum e.g. from financially supporting humanitarian projects in developing countries through parts of their profits to promoting learning of elementary and high school students about the relations between the environment and social justice. The cooperative and its projects are often used as concrete examples for solutions and taking concrete action (Flieger 2009, 2011a). A socio-political REPC is here defined as a REPC that has been independently founded by local citizens and aims at setting up renewable energy systems not only for the benefit of their members but also to support socio-political causes.

In this research, the focus lies on the difference between the support provided by intermediary organizations in institutional-organizational REPCs on the one hand and the independent foundation and management by citizens of civic-ecological and socio-political REPCs.

## *2.2 The dependent variables founding process and durable collective action capacity*

In this research, the REPC, more specifically the founding process and durable collective action capacity of REPCs, is treated as dependent variable, as it is aimed to assess the impact of intermediary organizations' support, which thus represents the independent variable in this research. This sections outline the dependent variables founding process and durable collective action capacity. First, the founding process is conceptualized in form of four different phases, the orientation phase, the planning phase, the founding phase and the project phase. Second, the durable collective action capacity of REPCs is conceptualized in form of human capital, intrinsic motivation and extrinsic motivation.

### **2.2.1 The founding process of a REPC**

In order to assess what forms of support provided by intermediary organizations have an impact on the founding process, it is useful to conceptualize it as a project and separate it into several phases. Most generally speaking, the founding process starts with the formation of an interest group, i.e. actors interested in initiating a REPC, and ends with the formal registration and first project realization of the REPC. In an article on project management standardization, Sattler (2013) proposes to view the founding process of a REPC as a project, since the successful founding and registration of a REPC as a legal entity is the basic requirement that has to be met so that it becomes operational, i.e. is able to start pursuing its goals as stated in their code of conduct. Additionally, it can be viewed as a project due to its uniqueness in always involving an exceptional actor constellation and takes place at a given place and time. It also involves higher risks for implementers, since the interest group is liable for all involved costs that may occur in the founding process<sup>36</sup>. Moreover, it is a

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<sup>36</sup> All participants of the interest group are personally liable for any commitments, including financial commitments that occur in the founding process until the REPC is registered. This also includes any commitments that have been made regarding the first project of a REPC, e.g. roof-leasing contracts etc. (Kaiser & Steinle 2013; Sattler 2013).

complex task, that requires a joint effort to be implemented and it is temporary, i.e. it starts at a certain time, with an idea, and ends at a certain point, namely the registration of the REPC (Sattler 2013).

The founding process can be separated into different phases. Flieger (2009) separates the founding process of REPCs into an orientation phase, a planning phase, an initiation phase and a stabilizing phase. Kaiser and Steinle (2013) divide the founding process of REPCs similarly into a pre-founding phase, containing an information and contact phase, a preparation phase, a founding phase and a post-founding phase. In both conceptualizations the successful passing of all four phase leads to the founding of a cooperative, or respective a REPC. Each phase contains respective goals and tasks connected to it that need to be reached in order to successfully establish the organization.

By viewing the founding process as a project and separating it into different phases, the goals that have to be achieved in each phase to found a cooperative can be framed as collective action outcomes, since a joint effort is needed to conduct the necessary tasks to reach the respective goals (Olson 1965). Furthermore, it is possible to link forms of support to the respective tasks that have to be fulfilled in order to achieve the different goals within the phases of the founding process. To assess what impact SO and/or PO support has on the founding process, it can be useful to gain insights on how easy or difficult it was for the interest group to conduct the underlying tasks to reach the respective goals. It is assumed here that the involvement of a SO and/or a PO positively correlates with the level of difficulty to conduct the founding process.

Based on Flieger (2009) and Kaiser and Steinle (2013) in this research the *founding process* is divided into four stages, namely: (1) *orientation phase*, (2) *planning phase*, (3) *founding phase*, and (4) *RE project phase*. The individual stages will be presented in the following. The phases will be conceptualized in relation to the respective goals they aim to achieve.

### 2.2.1.1 Orientation phase

The *orientation phase* comprises the time span between the first discussions of the business idea and the identification of people who are committed to realize the project, i.e. setting up a REPC to produce and sell electricity or heat to create a profit for its members. In this phase it is paramount that the initiating actors of the interest group gain the basic knowledge about the demands and benefits of a cooperative-based organizational structure, since many participants are usually not very familiar with cooperative business and organizational models (Gottwald 2013; Kaiser & Steinle 2013; Kühn 2013). This basic knowledge can enable the initiating actors to explain the whole concept to other people in their community and subsequently win them over as participants for the interest group. Ideally, an interest group consists of five to 15 people, depending on the complexity of the business model<sup>37</sup> (Kaiser & Steinle 2013). Accordingly, the interest group also needs to review the respective qualifications of its members in order to assess their ability to establish and manage a REPC. This might entail attracting and recruiting further members if the current group members' qualifications do not cover the needed abilities to do so (Flieger 2009; Gottwald 2013; Kühn 2013). Here it is useful when initiators have access to local actors with the relevant skills for establishing a REPC and realizing RE-projects, e.g. members of other REPCs or cooperatives in the region, individual RE-project developers, financial and tax accountants, engineers etc. (Behr 2013; Gottwald 2013; Kühn 2013; Staab 2013b; Voigt 2013). This core interest group should be able to cover the following areas of expertise that are important to realize the

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<sup>37</sup> While the realization of smaller starting projects like roof top PV systems require less work, effort and man-power, larger renewable energy systems such as wind mills, local district heating grids and bio-gas plants require a lot (Behr 2013; Voigt 2013; Kühn 2013).

founding idea: investments, marketing and presentation of the cooperative, legal issues, financing, and public relations. When enough active participants are found that can cover the necessary disciplines, they can start to gather information on REPCs from their respective fields (Kaiser & Steinle 2013).

Regarding investment, research and estimates on what potential costs can occur for the whole pre-founding phase of the REPC, while covering marketing and presentation of the REPC, can ensure that a corporative identity and a marketing concept is formed and that a target group is identified. The group or individual that covers legal issues needs to gather information on the legal form of a cooperative, the code of conduct and other contracts necessary for the implementation of a first business project. Unlike the investment group, the financial group needs to identify a first project and estimate the costs, to be able to calculate the necessary internal and external capital and subsequently to think of ways to acquire the respective capital. The individual or group that deals with the discipline public relations needs to gather information on how to promote the REPC in the community to the identified target groups. The target groups include potential members in the community or region, property owners of possible sites for a RE project etc., as well as possible partner organizations, if desired (Kaiser & Steinle 2013).

As each founding process is unique, it would not be useful for this research to conceptualize the exact covering of the different disciplines as a collective action goal. A more fruitful approach is to view the successful recruitment of like-minded and skilled members, the assignment of roles and related tasks to members of the interest group and an agreement on the business model of the REPC<sup>38</sup>, to gain the necessary information and knowledge for the planning phase. as collective action goals of the orientation phase Like-minded and skilled active members that are well-organized can not only be paramount for the founding process, but also for the efficient realization of a renewable energy project and thus the further development of a REPC (Flieger 2011b Gottwald 2013; Hoffman and High-Pippert 2005; Kanik 2013; Kühn 2013; Staab 2013a; Voigt 2013). This will be returned to when describing the durable collective action capacity of REPCs. Like-minded and skilled members that follow similar ideals and that want to pursue the same idea<sup>39</sup> are important, as the interest group members depend on each others commitment to fulfill the necessary tasks to reach the respective goals in the orientation phase. Difficulty in making decisions on the roles and tasks of the members in the interest group and on the respective business model for the REPC can reveal if the group had problems to the gather the necessary information and knowledge for the planning phase. To discover and assess the impact of intermediary organizations' support, it is useful to analyze whether the interest group had difficulties in reaching the respective goals in the orientation phase.

In sum, the following indicators are proposed to assess the completion of this phase: (a) the recruitment of like-minded members, (b) the recruitment of skilled members, (c) decision-making on roles and related tasks in the interest group, and (d) decision-making for an adequate business model.

### *2.2.1.2 Planning phase*

The planning phase of a REPC begins after the interest group gathered enough information<sup>40</sup> in the different knowledge fields to devise a concrete plan on how to realize the initial idea and is able to conduct the strategic and target planning for realizing the REPC and its first RE

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<sup>38</sup> This refers to the RE technology and the respective possible business models.

<sup>39</sup> I.e. realizing community owned RE projects by establishing and managing of a REPC, through voluntary collective action.

<sup>40</sup> The respective length of this depends of course on the skills and backgrounds of the members of the interest group.

project. The planning phase is considered to be the most crucial and work-intensive phase of the founding process. Here the foundations for the formal launch of the REPC are laid (Kaiser & Steinle 2013; Flieger 2009). In this phase the interest group needs to mutually agree on the concrete business plan and project and on how to organize the cooperative, i.e. assigning potential management and advisory board members. Moreover, they need to estimate and agree how high the investment and capital demands for the first project are and how to finance it (Kaiser & Steinle 2013; Flieger 2009). Accordingly, the planning phase ends when the following collective action goals have been achieved: a code of conduct has been formulated, a business case including a business plan for the first project have been formulated, the founding event has been planned and organized (including the preparation of all necessary contracts and legal documents, selecting a room for the event, preparing a presentation, inviting guest speakers etc.) and the public has been informed about the idea and the founding event (Kaiser & Steinle 2013).

Four indicators are proposed to assess the completion of the planning phase: (a) the difficulty to formulate a code of conduct, (b) the difficulty to formulate a business case, (c) the difficulty to organize the founding event, and (d) the difficulty to promote the founding event.

### *2.2.1.3 Founding phase*

The *founding phase* of the founding process begins with the official founding event and ends with the registration of the REPC<sup>41</sup>. The founding event itself lasts only one afternoon, where members of the interest group and other interested members sign the code of conduct and become members of the REPC by acquiring at least the required minimum share. Here the members of the interest group are usually appointed and elected into the advisory and the management board of the REPC. At the end of the founding event the necessary legal documents are collected to register the REPC and send to the respective registry court<sup>42</sup> (Flieger 2009; Kaiser & Steinle 2013).

The goals that have to be reached in this phase are gaining as many new members as possible or necessary for the first project and successfully registering the REPC. If the founding event was well promoted in the community, it should have attracted additional individuals outside of the interest group that are willing to become a member and financially support the REPC. A careful planning of the founding event can also prevent difficulties in registering the REPC. However, difficulties in the registration of the REPC can also occur due to the respective registry courts<sup>43</sup> (Janik 2013). Therefore, the chosen indicators for the founding phase are (a) the difficulty to register the REPC, and (b) the number of members after the founding event.

### *2.2.1.4 Project phase*

In the RE *project phase* the first concrete RE-project is planned and implemented. The concept of a RE-project phase has been chosen over the concepts of a post-founding phase (Kaiser & Steinle 2013) and a stabilization phase (Flieger 2009) that start after the founding event and the registration of the REPC, since it is one of the research goals to assess the influence of specific forms of support by intermediary organizations on the establishment of a REPC. In this research the founding process is restricted to the actual establishment of a

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<sup>41</sup> The registration is usually conducted at a register of cooperatives and/or a registry of commerce, depending on the respective country's legal requirements.

<sup>42</sup> For a detailed overview on the formal procedure see for example

<sup>43</sup> Usually the registration of a REPC takes up between four to six weeks and if they are really fast the registration only takes two to three weeks (Janik 2013).

REPC and the implementation of its first RE project. As opposed to the orientation, planning and founding phase, the RE-project phase has no clear beginning but is ongoing. It ends with the implementation of the first RE-project. Also, parts of what could also be considered the goals of the project phase that have to be reached in order to implement the project have already been required in the planning phase, as it is already considered a goal for this phase in order to become sufficiently concrete to enter the founding phase. This relates to the formulation of a business case that also comprises the business plan for the first RE-project. Most tasks that need to be fulfilled in the RE project phase are either conducted during the planning phase or after the founding phase. Accordingly, the concept of a project phase with different goals to be reached enables the assessment of whether the support by an intermediary organization had a direct influence on the implementation of the first RE-project.

The realization of a RE-project comprises a number of organizing challenges in terms of efficient project management for the active members of a REPC, which is shown here on the example of a standard PV-rooftop project. Flieger (2009; 2011b) identifies relevant local actors that need to be contacted, i.e. property owners that own the potential RE system site, independent auditors for a frequent quality check of the system, grid operators to work out feed-in contracts, an insurance company to insure the PV-system sufficiently, providers of PV-systems and local or regional banks to generate external capital for the project<sup>44</sup>. With all those parties contracts need to be negotiated; this can prove to be a challenging task, especially for laymen.

The identification of these local actors makes it possible to deduct the necessary tasks and respective collective action goals in the RE project phase that need to be achieved<sup>45</sup>. Accordingly, the indicators for the RE project phase are: (a) the difficulty for the active members to select an appropriate site for their RE project, (b) the difficulty to work out user contracts with property or roof owners, (c) the difficulty to decide on a PV-seller, (d) the difficulty to work out a contract with an independent auditor, (e) the difficulty to work out a feed-in tariff contract with a local grid operator, (f) the difficulty to decide on an insurance for the PV-system and (g) the difficulty to generate external capital for the projects.

### *2.2.1.5 Overview of the dependent variable of the founding process*

Table 1 provides an overview of the dependent variable relating to the founding process. Accordingly, the variable founding process is divided into the sub-variables that are represented by the different phases of the founding process and that include the indicators for the specific goals and related tasks that have to be conducted in each phase.

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<sup>44</sup> A project can also be funded entirely by internal capital, but by acquiring external capital a REPC can make use of the operating leverage effect and make higher profits in the long turn.

<sup>45</sup> As mentioned above, since most RECPs start out with a PV-projects in Germany (Flieger 2011b; Gottwald 2013; Janik 2013; Staab 2013a), the focus lies on the implementation of PV projects. Further explanation on the decision can be obtained in the methodology section.

Table 1: Overview of the dependent variable founding process and its sub-variables and indicators

| Sub-variables            | Indicators  |
|--------------------------|---|
| <i>Orientation phase</i> | Level of difficulty to:<br>1) recruit like-minded members<br>2) recruit skilled members<br>3) decide upon on roles and related tasks in the interest group<br>4) decision-making for an adequate business model   |
| <i>Planning phase</i>    | Level of difficulty to:<br>1) formulate a code of conduct<br>2) formulate a business case<br>3) organize the founding event<br>4) promote the founding event  |
| <i>Founding phase</i>    | 1) Level of difficulty to register the REPC<br>2) the number of members after the founding event  |
| <i>Project phase</i>     | Level of difficulty to:<br>1) select an appropriate site for their RE project<br>2) work out user contracts with property or roof owners<br>3) decide on a PV-seller<br>4) work out a contract with an independent auditor<br>5) work out a feed-in tariff contract with a local grid operator<br>6) decide on an insurance for the PV-system<br>7) generate external capital for the project |

### 2.2.2 Durable collective action capacity

This section describes the conceptualization of durable collective action capacity of a REPC, which is required for the further development of the REPC after the founding process. As mentioned in section 2.2.1, Flieger (2009) conceptualizes the time right after the founding phase as the stabilization phase. Similarly, Kaiser and Steinle (2013) conceptualize it as the post-founding phase. Here, the organizational structure begins to consolidate in terms of institutionalized roles and related tasks of active members and the REPC becomes operational, i.e. active members have regular meetings and are able to identify, plan and implement potential projects (Flieger 2009; Kaiser & Steinle 2013). These consolidation processes are very important for the future development of the REPC, since most active members have to work on a voluntary basis in the early years of a REPC, in order maintain liquidity and to keep the enterprise profitable for all of its members (Volz 2012). Voluntary work often leads to slower progress in terms of project planning and implementation, since most active members have only limited time to manage the REPC<sup>46</sup> because they primarily have to pursue their principal occupation (Elpers 2013; Kühn 2013; Voigt 2013). In a fast changing environment like the renewable energy market and its respective support policies, this can significantly hinder the progress of a REPC<sup>47</sup>. Additionally, every new project not only leads to a temporary increase in workload due to project planning and implementation, but also to an ongoing management effort of existing RE systems<sup>48</sup>, slightly increasing with each additional project (Elpers 2013; Kühn 2013; Voigt 2013). While the average work hours in REPCs managing a local heating districts based on RE comprise around 13.7 hours per

<sup>46</sup> For most active members the work of the REPC is like a unpaid side job next to their principal occupation (Elpers 2013).

<sup>47</sup> Elpers' (2013) REPC, as many other REPCs, had to plan projects completely from scratch again, after continuous amendments in the German renewable energy act. That cost a lot of time and motivation.

<sup>48</sup> E.g. calculation of proceeds, quality management etc.



week, they only comprise 7.5 hours per week for REPCs that solely manage PV-systems<sup>49</sup> (Volz 2012). Moreover, the realization of new projects requires additional funding either from existing members or by attracting new members, which goes hand in hand with additional promotion efforts for the new project (Volz 2012). This can negatively affect the motivation of active members to invest their time in the further development of the REPC. Without a part-time assistant<sup>50</sup> or a full-time management board the REPC can only realize a certain number or specific type<sup>51</sup> of projects until active members reach the limits of their individual working capacities (Elpers 2013; Kühn 2013; Voigt 2013). Nevertheless, when realizing new projects and accessing new business areas a REPC can also increase its profits and is eventually able to afford a part-time assistant or a full-time management board (Janik 2013; Kühn 2013; Voigt 2013). The installment of a full-time management board can therefore increase a REPC's organizational strength in terms of securing long-term engagement for the further development of a REPC (Kühn 2013; Voigt 2013).

In summary, a REPC requires durable collective action in order to develop further beyond a certain threshold, so that the management boards can professionalize and the organization can pursue its respective goals<sup>52</sup>, as stated in their code of conduct, in the long-term. Accordingly, durable collective action capacity of a REPC is defined as the ability of its active members to professionalize and to pursue its goals. The conceptualization of the durable collective action capacity of a REPC, draws on the research of Barnes and van Laerhoven (2013), who studied the influence of external agents on the expected durability of collective action in joint forest management initiatives in Maharashtra (India), which is combined with insights from Verba et. (1995), who researched voluntarism in political organizations, and additional insights from community energy literature (Hoffman & High-Pippert 2005; 2010; Walker 2008) and expert interviews. The insights are synthesized into three elements making up durable collective action capacity: (1) Human capital in REPCs, (2) intrinsic motivation, and (3) extrinsic motivation. These variables will be further elaborated on in the following.

### *2.2.2.1 Human capital in REPCs*

The term human capital was coined by Theodore W. Schultz (1961) and generally refers to the productive capacity of individuals operating in an economic setting that is determined by their skills and knowledge. These specific skills and knowledge do not only depend on the specific training and education, but often also on one's upbringing and the social status of his or her family (Becker 1964). Human capital can be of economic value and positively correlates with the economic development of a country or a company (Becker 1962; Benhabib & Spiegel 1994). This notion holds also true in the context of REPCs as the human capital of its members can not only potentially contribute to its economic success but also to fulfilling environmental or social goals of a REPC. Like every other company a REPC depends on human capital to be able to implement its projects, which requires human capital related

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<sup>49</sup> Based on a study by Volz (2012), who researched the role and potentials of REPCs in Germany on the basis of comparing 122 REPCs, including 84 PV cooperatives and 21 local district heating cooperatives and 9 mixed REPCs.

<sup>50</sup> This includes secretaries, technical assistants that service the RE-system, e.g. operator of a bio-gas plant etc.

<sup>51</sup> This includes for example small-scale projects like PV-rooftop systems and micro hydro power plants. Larger projects like bio-gas plants, local district heating grids demand significantly higher maintenance and servicing efforts and therefore having to employ a technical assistant on half-time is almost indispensable (Behr 2013; Voigt 2013).

<sup>52</sup> Nevertheless, some REPCs do not plan to professionalize the REPC in the long-run, especially when they are 'only' handling one large project like a local heating grid based on RE, where the ongoing management effort stays constant (Behr 2013).

to its main field of business. Leaning on the indicators from Barnes and van Laerhoven (2013) for durable collective action and insights from expert interviews, three sub-variables for the presence of human capital can be identified for REPCs. These comprise (a) the perceived management capacity, (b) organizational strength and (c) the level of connections with other REPC members. Each consist of further sub-variables.

#### **2.2.2.1.1 Management capacity**

The management capacity is determined by the confidence of the active members that they can continue their collective action without depending on external agents (Barnes & van Laerhoven 2013). In the context of a REPC the level of perceived management capacity refers to the active members' perception about their respective groups' ability to continue their collective action, namely realizing and managing new renewable energy projects in the region, without external agents, i.e. renewable energy project developers. This perceived management capacity is important for active members, as self-confidence in one's abilities and an entrepreneurial spirit can foster the durable collective action capacity of a REPC. It also includes that everyone knows the scope of his/her abilities. Moreover, the management capacity of active members increases when an internal expertise in RE-project management is present and developed further in the long-term, to make sure the external expertise does not take over when REPCs want to realize larger RE-projects (Staab 2013a; 2013b).

Regarding the realization of RE-projects it is important to keep in mind that many countries around the world and 24 out of 27 EU-member states have introduced tariff systems for renewable electricity generation as a main support instrument in recent years (European Commission 2012). Out of these 24 member states, 18 guarantee priority access for renewables into the electricity grid, which gives owners of RE systems a certain investment security (RES Legal 2013). Besides feed-in tariff systems various models of direct marketing of RE-electricity can also be implemented. The development of new marketing models is gaining significance for REPCs as the RE market has been and is currently undergoing rapid changes that pose not only challenges but also opportunities for implementing new business models (Staab 2013b). Therefore, it is really important for the active members to know their possibilities and to stay up-to-date in this aspect. They especially need to identify other ways than selling the generated electricity through the FIT-model, to see if there are options that might be more profitable for future projects (Gottwald 2013; Janik 2013). A REPC that develops solely on the basis of small projects, like PV-rooftop systems runs the risk of investing more time and work than the return justifies after a certain point (Voigt 2013).

When active REPC members want to move on to larger projects, they need to make sure that they are able to realize them on their own in the medium-term<sup>53</sup> to be independent from external agents like RE-project developers, so that they only need to acquire services for specific tasks that they cannot realize on their own, i.e. technical engineering, construction of the system etc. (Voigt 2013). In terms of fostering long-term involvement of active members it can increase the self-confidence of active members to perceive to be independent from external help (Behr 2013). Most REPCs, however, require assistance from RE-project developers for their first large-scale projects (Behr 2013; Gottwald 2013; Janik 2013; Kühn 2013; Voigt 2013). While small-scale projects like PV-rooftop systems are relatively easy to realize, large-scale projects close to or larger than 1 MWp – such as free standing PV-systems, local heating grids and wind mills – require a lot of time, effort and additional knowledge (Behr 2013; Kühn 2013). Many project developers offer turn-key projects that can be transferred to a REPC<sup>54</sup>.

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<sup>53</sup> This comprises the first five years after the founding of the REPC.

<sup>54</sup> See for example Nordex (2014), Juwi (2014) and ZEN Duurzam (2014).

However, external RE-project developers also have an interest to sell the project for a price as high as possible, which is of course contrary to the interest of the REPC, that wants the price to be as low as possible to make a larger long-term profit. If, for example, a RE-project development company develops a project and subsequently sells parts of it to the REPC it is not so important for them if they earn the money in the sub-company that manages the RE-system. On the contrary, they try to gain the lion share of the profits in the project's development phase, since they do not have to share these profits and can then sell the product overpriced to the operating sub-company<sup>55</sup>. That means even when a RE-project development company is a shareholder in the managing sub-company, the annual revenues from the system are not so important for them, since it already made its main share of the profit in selling the project to the REPC (Voigt 2013).

Similarly, partnerships through indirect citizen participation models<sup>56</sup> for large RE-projects with conventional public and private utility<sup>57</sup> companies should be thoroughly considered, since they do not necessarily share the same interests as the REPC. Here it is important to consider where the added value would be generated, who gets how many shares and if the REPC is seriously involved in the operative business with the respective voting power according to their shares in the sub-company (Holstenkamp & Degenhardt 2013; Holstenkamp & Müller 2013; Voigt 2013). On this basis four indicators have been developed for the perceived management capacity of a REPC: (a) level of management capacity for FiT-business models, (b) level of management capacity for direct marketing business models, (c) level of management capacity realize large PV-projects independently and (d) level of management capacity to realize other large RE-projects independently.

Next to measuring the management capacity of a REPC through the perceived management capacity, it can also be useful to use other indicators such as the PV-capacity installed by the REPC. A high amount of installed PV-capacity indicates that the active members, usually the REPC management board, are either capable of realizing and managing a large number of small to medium PV-projects or capable of realizing and managing larger PV-projects. Nevertheless, the installed PV-capacity alone does not allow for drawing conclusions about the durability of the active members' collective action within the REPC. Therefore, it can be useful to also use the year of the latest installed RE-project as an additional indicator, as it shows how active the REPC has been in recent years and therefore allows for conclusions about the durability of collective action within the REPC (Flieger 2013b). Additionally, the type of the latest RE project that has been realized can also serve as an indicator to see whether the REPC has further developed in terms of diversifying their RE-portfolio through knowledge gains. Examples of diversification are large PV-projects such as free standing PV-systems. These are technically the most feasible to realize independently, while wind farms and RE-based combined power and heating plants are more demanding regarding the planning process and the installation of the system and therefore often require a project partner as mentioned above (Flieger 2013b). Accordingly, large RE-projects that have not been realized through a passive participation model can also serve as an indicator for the type of RE-project. Moreover, the year and type of the last project in planning can serve similarly as an indicator for the durability of collective action in terms of the REPCs management capacity. It is argued here that a high level of management capacity positively contributes to the durable collective action capacity of a REPC.

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<sup>55</sup> For similar reasons Behr's (2013) REPC decided to step out of a partnership with a regional gas provider to develop the local district heating grid on their own.

<sup>56</sup> In those models the REPC is usually a silent junior partner in a sub-company managing the project, that can co-invest by buying shares with a fixed rate of return around 7% on the annual revenue, but is excluded from operative side of the business, which is run by staff from the energy provider or RE-project development company (Flieger 2013b; Voigt 2013; Holstenkamp & Degenhardt 2013).

<sup>57</sup> Meant are providers that primarily produce electricity on the basis of fossil fuels.

Following from the above, management capacity is divided into two different sections. On the one hand, it is determined by (a) management capacity for FiT-business models, (b) management capacity for direct marketing models, (c) management capacity to realize larger PV-projects independently, and (d) management capacity to realize other large RE-projects independently. On the other hand, it can be assessed in terms of the number of and type of RE-instalments and the REPCs latest activity. The criteria are (a) installed PV-capacity, (b) latest installed RE-project, (c) latest type of project realized, and (d) latest type of project planned. It is argued here that a high level of management capacity positively contributes to the durable collective action capacity of a REPC.

#### **2.2.2.1.2 Organizational strength**

Organizational strength describes the ability of the REPC to fulfil their organizational tasks. In terms of durable collective action it is hereby important that the involved individuals understand the roles and related tasks of all relevant participants (Barnes & Laerhoven 2013). Besides the project management skills of active REPC members it is therefore important that active members also understand the cooperative's organizational structure, since a REPC is a collective action organization with specific roles and tasks for its members. Accordingly, clear structures are important, i.e. all active participants need to know who is doing what in the organization (Gottwald 2013). These structures usually develop over time as the active members get used to the organizational model of a cooperative and have regular meetings. In practice, many REPCs do not have a strict hierarchy like other businesses (Staab 2013b). The introduction of institutionalized rules of procedure, which precisely allocate the roles and related tasks, can therefore be useful to avoid misunderstandings and frustration (Kühn 2013).

As the organization also depends on voluntary work from its active members it is important that the future success of the REPC does not solely depend on the participation by a handful members. REPCs in which one or two persons do almost everything on their own are less durable when an active member has to resign from his/her position for some reason, since the other members are usually not able to replace the person in the short-term in the same quality (Gottwald 2013; Kühn 2013). In turn, that also means that the main active members, i.e. the management board, need to be ready to accept help from other members. Therefore, the REPC needs some form of system to avoid such a situation (Kühn 2013). In many REPCs the management board shares the majority of the work with the advisory board, and some REPCs operate systems where they count in and set aside additional labor costs for the management board for each realized project, so that in case of a dropout they can temporarily hire someone who can do this work instead (Kühn 2013). Other REPCs share the work collaboratively with other active members in working groups for specific topics that advise the management board on related decisions and active members who help to prepare projects, i.e. gather first information etc. (Gottwald 2013).

By taking the above into consideration, organizational strength is conceptualized as being indicated by (a) the active members' level of understanding of the roles and related task in their REPC, (b) the general substitutability of the management board and (c) the substitutability of the management board in the same quality. It is argued here that a high level of organizational strength positively contributes to the durable collective action capacity of a REPC.

#### **2.2.2.1.3 Connections to others**

Internal and external connections of REPC members to other members from either their or another cooperative have several advantages for building human capital. These relate to trust building, knowledge exchange and cross-cooperative cooperation.

First, in a collective action situation frequent meetings of participants can allow for concurrence on conflict of interest and the building of trust and reciprocity (Barnes & van Laerhoven 2013). Leach and Sabatier (2005) see trust as a precursor to consensus building and collective action that result from recent evidence of the trustworthiness of other parties and from institutions that encourage trustworthiness. In the context of REPCs this includes meetings with other active members and meetings with members from other REPCs. It would be fatal for the future development of the REPC if active members would only meet each other at the mandatory general assembly once a year, since regular meetings can create a sense of belonging, give a feeling that one's opinion counts and that he/she is important (Staab 2013b).

Second, in terms of exchanging technical knowledge and experience with different marketing models, it is also important that REPCs are in frequent contact with other RECs or REPCs (Gottwald 2013; Janik 2013; Kühn 2013). Through exchange with others especially innovative REPCs can potentially expand their business model to other fields and even create synergies with other RECs or REPCs through creating small actor networks of different backgrounds in the renewable energy market (Janik 2013). Especially in terms of technical and practical knowledge transfer this can be paramount for the REPC, since it can help to avoid or minimize the dependency on RE-project developers or other agents when developing larger projects. In relation to the third benefit of connectivity, this can foster the cooperation between REPCs on realizing large regional RE-projects, like wind farms, as business partners with the same interests (Kühn 2013; Voigt 2013). This may also serve to avoid competition between REPCs for regional projects (Kühn 2013).

In sum, connections to others encompasses the following indicators: (a) level of connections to other active members of the REPC, (b) frequency of connections to other active members of the REPC, (c) level of connections to members of other REPCs, and (d) frequency of connections to members of other REPCs. It is argued here that the amount of contacts and the frequency to internal and external REPC members positively contributes to the durable collective action capacity of a REPC.

#### 2.2.2.1.4 Overview of the dependent variable human capital

Table 2 provides an overview on the dependent variable human capital and the respective sub-variables management capacity, organizational strength and connection to others, including the indicators for the respective sub-variables.

Table 2: Overview on the sub-variables and indicators for the dependent variable Human capital

| Sub-variables              | Indicators   |
|----------------------------|--|
| <i>Management capacity</i> | <p><b>Level of perceived:</b></p> <ol style="list-style-type: none"> <li>1) Management capacity for FiT-business models</li> <li>2) Management capacity for direct marketing models</li> <li>3) Management capacity to realize large PV projects independently</li> <li>4) Management capacity to realize other large RE projects independently</li> </ol> <p><b>Number and Type of RE-instalments and latest activity</b></p> <ol style="list-style-type: none"> <li>1) Installed PV-capacity</li> <li>2) Latest installed RE-project</li> <li>3) Latest type of project realized</li> <li>4) Latest type of project planned</li> </ol> |

|                                |  |
|--------------------------------|--|
| <i>Organizational strength</i> | <b>Level of perceived:</b><br>1) Understanding of the roles and related task<br>2) General replaceability of the management board<br>3) Replaceability of the management board in the same quality   |
| <i>Connection to others</i>    | 1) Level of connections to other active members of the REPC<br>2) Frequency of connections to other active members of the REPC<br>3) Level of connections to members of other REPCs<br>4) Frequency of connections to members of other REPCs |

### 2.2.2.2 *Intrinsic and extrinsic motivation for durable collective action in REPCs*

An important notion that drives individuals to engage and to stay engaged in collective action is their motivation. This is especially true for active members in a REPC, since they usually do not benefit financially from their voluntary work and receive the same share on their investments as an investing member that is otherwise inactive. In order to conceptualize motivation as a variable that determines the durable collective action capacity of a REPC and that in turn might also be influenced by intermediary organizations' support, it is useful to look into cognitive evaluation theory (CET) that was introduced by Deci (1975) and further developed by Deci and Ryan into self-determination theory (1985). In its most basic sense, to be motivated means to be driven to do something. Individuals "vary not only in level of motivation (i.e. how much motivation), but also in the orientation of that motivation (i.e., what type of motivation)" (Ryan & Deci 2000, p.54). This orientation can be separated into intrinsic and extrinsic motivation<sup>58</sup>. In the following, first the intrinsic motivation of REPCs will be conceptualized, followed by the extrinsic motivation.

#### 2.2.2.2.1 **Intrinsic motivation**

Intrinsic motivation refers to actively engaging in something because it is interesting or enjoyable, rather than because of rewards, pressure or other external prods (Ryan & Deci 2000). It does not only exist within individuals, but also in the relation between individuals and activities, i.e. individuals can be intrinsically motivated to engage in some activities and not others. This circumstance is related to the perception of one's own competence (or self efficacy) and the perception of one's autonomy<sup>59</sup>, that either facilitates or undermines an individual's intrinsic motivation to take action (Ryan & Deci 1985; 2000). Accordingly, intrinsic motivation is seen as an organismic propensity that can only be catalyzed by, and not caused by, interpersonal events and structures, such as rewards, communications and feedback. Intrinsic motivation is therefore facilitated for example by freedom from demeaning evaluations, effectance promoting feedback and optimal challenges for the individual (Ryan & Deci 1985; 2000).

In the context of collective action in REPCs especially social incentives may play a role in the intrinsic motivation of active members as "people are sometimes also motivated by a desire to win prestige, respect friendship, and other social or psychological objectives" (Olson 1971, p.60). Accordingly, the perception of gaining social status and social acceptance can be important to keep executive and advisory board and other active members motivated to conduct the necessary organizational work and to develop the REPC further, since they have no personal economic incentives in the early years of the REPC. The importance of social incentives in collective action situations is also reflected in the study of Verba et al. (1995) on voluntarism in American politics. The authors identify four

<sup>58</sup> For a more detailed overview on the (sub-)types of motivation see (Ryan & Deci 2000, p.61).

<sup>59</sup> i.e. the experience that their behavior is self-determined regarding the specific tasks at hand.

motivations for individuals to take part in political activity, namely material benefits, social gratification, civic gratification and the desire to influence policy outcomes. Of these, social and civic gratification can be considered as relating to intrinsic motivation. They play an important role in the context of long-term voluntary work for the REPC. Social and civic gratifications however can only be obtained by taking part in the respective activities of a group (Verba et al. 1995). The importance of social and civic gratification for engaging citizens in renewable energy projects is also reflected in the community energy literature (Hoffman & High-Pippert 2005; 2010; Walker & Devine-Wright 2008). In this research the level of social and civic gratification are used as indicators that for the intrinsic motivation of active members in a REPC to participate in the long-term. They are described in the following.

#### *2.2.2.2.1.1 Social gratification*

Social gratification is connected to the perception of gaining social status and social acceptance and can result from the enjoyment of working with others on a common project (Verba et al. 1995). The enjoyment of working with others on a common project is especially important for durable collective action that is based on voluntary work, since disliking the work with others can be expected to hamper the willingness of the participants to stay involved in RE-projects in long-term (Hoffman & High-Pippert 2010). This is also true for REPCs (Elpers 2013; Kühn 2013; Staab 2013a). Enjoyment of working with others is a key motivation, especially since it helps to cope with the downsides of active involvement. It helps to ease the pressure that stems from the responsibility that grows with every additional project and member (Elpers 2013).

Similarly, it is important that an active member feels that his/her personal work contribution is appreciated by other active members (Elpers 2013; Kühn 2013). It can be frustrating when inactive members do not realize how much work the active members actually contribute (Elpers 2013). Accordingly, feeling respect and thankfulness are key motivations for active members to stay involved in a REPC and go hand in hand with the will to take part in collective action (Kühn 2013). Already small gestures, e.g. publicly honouring and thanking active members for their work by a representative of the general assembly, can contribute to such a working atmosphere (Gottwald 2013). To be able to assess the level of social gratification among the active members of a REPC, two sub-indicators are proposed here: (a) the level of enjoyment of working with other active members and (b) the perceived appreciation of personal work contribution by other active members. It is assumed here that a high level of social gratification of active REPC members positively contributes to the intrinsic motivation of active members and therefore to the durable collective action capacity of a REPC.

#### *2.2.2.2.1.2 Civic gratification*

Similar to social gratification, civic gratification may play an important role for the intrinsic motivation of an active member to stay engaged in voluntary collective action within the REPC. Civic gratification refers to the feeling of an individual that he/she fulfills a civic duty and that he/she contributes to his/her community's welfare. Like social gratification it can only be obtained through active participation in a project and it provides another non-economic incentive (Verba et al. 1995) that may be of importance in the context of a REPC. In REPCs, civic gratification can emerge from actively participating in the management of the REPC and by perceiving the renewable energy projects and their membership along with its related duties to be beneficial for and connected to the welfare of their local community (Behr 2013; Janik 2013; Kühn 2013; Staab 2013b; Voigt 2013). In a case study on four community renewable energy initiatives, Hoffman and High-Pippert (2005) termed this

perception community connectedness. Community connectedness refers to the feeling of participants that a community renewable energy project brings various benefits to one's community as a whole and is closely linked with civic gratification (Hoffman & High-Pippert 2005; 2010). RE-projects foster regional monetary cycles because the profit flow from electricity production is redirected from supra-regional utility companies towards the owners of small to medium sized generation systems in the region (Hirschl et al. 2010). Local construction companies<sup>60</sup> usually conduct the on-site construction and the maintenance of the power systems, which creates jobs and generates lease and tax income for a municipality, thus regional added value is created<sup>61</sup> (Hirschl et al. 2010). Accordingly, it is also important that active members perceive their engagement in the REPC as a personal contribution to the added value of his/her locality or region, since it can pose a motivation in terms of civic gratification (Behr 2013; Kühn 2013; Staab 2013b). This is especially true for rural areas, since they have structural disadvantages in comparison to urban areas that can be partially eliminated by allocating space for renewable energy systems (Kühn 2013). Producing RE locally, regionally and independently can therefore increase the level of civic gratification and the notion that active members are primarily interested in realizing local or regional projects can additionally indicate their interest in creating regional added value (Behr 2013; Staab 2013a).

Moreover, the perception of one's work as part of fulfilling his/her civic duty<sup>62</sup> can also foster the intrinsic motivation of an active member to stay engaged in a REPC. Working in a REPC can give people the feeling to be able to actively do something for their community and thus increase the level of intrinsic motivation (Behr 2013; Elpers 2013). On this basis, three indicators are proposed for this research that determine the level of civic gratification of active members of a REPC, namely (a) the level of interest in local or regional projects, (b) the level of conviction that personal engagement leads to regional added value, and (c) the level of conviction that engagement in the REPC is a form of civic duty.

#### 2.2.2.2.1.3 Overview of the dependent variable intrinsic motivation

Table 3 provides an overview on the dependent variable intrinsic motivation and the respective sub-variables civic gratification and social gratification, including the indicators for the respective sub-variables.

Table 3: Overview of the sub-variables and indicators for the dependent variable Intrinsic Motivation

| Sub-variables               | Indicators   |
|-----------------------------|--|
| <i>Social gratification</i> | 1) Level of enjoyment of working with active members<br>2) Level of appreciation of personal work contribution by other active members   |
| <i>Civic gratification</i>  | 1) Level of interest in local/regional projects<br>2) Level of conviction that personal engagement leads to regional added value<br>3) Level of conviction that engagement in the REPC is a form of civic duty |

<sup>60</sup> E.g. roofers, electricians etc.

<sup>61</sup> It is estimated that renewable energy generated about € 6.8 billion in regional added-value on a municipal level only in Germany in 2009 (Hirschl et al. 2010)

<sup>62</sup> When they feel connected to their community and see that they are able to positively contribute to their welfare, through contributing their expertise to the REPC, it can create a sense of responsibility towards their community and thus as the fulfillment of a voluntary duty for their community.



#### **2.2.2.2.2 Extrinsic motivation**

In contrast to intrinsic motivation, extrinsic motivation is connected to the individual's separable or instrumental value of a task, i.e. the individual gets engaged in an activity not because he finds it interesting or enjoyable, but because he or she expects to get something out of it or if he or she can avoid negative consequences. Extrinsic motivation also varies in its degree of autonomy. This is connected to the individual's perceived locus of causality, i.e. whether the motivation is perceived to be imposed externally or whether it is perceived to be internally, based on one's own decision (Ryan & Deci 2000). For example, when an individual does something to avoid sanctions it is rather non-autonomous, whereas an individual that gets involved in an activity that he or she does not like, with the expectation of receiving some form of reward resulting from the engagement, acts relatively autonomously, depending on the individual's dependency on the reward (Ryan & Deci 2000). Since most REPCs are managed on a voluntary basis, the level of confidence of active members in future benefits or a non-monetary incentive system are useful indicators for extrinsic motivation in a REPC. It is assumed here that (a) the level of confidence of active members in future benefits and (b) the presence of an incentive system or plans to install one positively contributes to the extrinsic motivation and therefore to the durable collective action capacity of a REPC. Both will be consecutively outlined in the following.

##### *2.2.2.2.2.1 Confidence in future benefits*

In collective action situations it is important that participants are confident that their action will benefit them in the future (Barnes & van Laerhoven 2013). In the context of a voluntarily operated REPC, active members have no monetary incentive to manage the REPC and to realize new projects beyond the annual rate of return that every member is entitled to. Therefore, the conviction of active members that they will personally benefit from their engagement in the long-run, e.g. in form of personal benefits related to their profession or business, learning new skills, gaining local or regional prestige<sup>63</sup>, can be important for long-term engagement (Elpers 2013; Gottwald 2013; Janik 2013; Kühn 2013).

Another significant aspect is the conviction of active members that their personal engagement is important in the long-run to achieve the goals of the REPC as stated in the code of conduct. People often become engaged in the active initiation and management of a REPC simply because no one else did it before them and they often perceive that no one else would do it as good as them (Gottwald 2013). They thus autonomously stay engaged to avoid negative consequences (Ryan & Deci 2000). Additionally, as active members are operating a business they have responsibility over all members' invested capital, and therefore mainly money from people in their community or region (Elpers 2013). Accordingly, two indicators are proposed in this research that determine the level of confidence in future benefits, namely (a) the level of conviction that personal engagement in the REPC is important and (b) the level of personal benefit expectations from engagement.

##### *2.2.2.2.2.2 Presence of a non-monetary incentive system*

Since most REPCs are not able to pay their active members for their work contributions, a non-monetary incentive system can play an important role as an extrinsic motivation to stay engaged in the long-term (Behr 2013; Gottwald 2013; Janik 2013; Elpers 2013; Kühn 2013). It can work as an instrument for the REPC as a whole to acknowledge the active members' work contribution in a REPC (Gottwald 2013). Non-monetary incentives can include using

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<sup>63</sup> This can include the feeling of being acknowledged as a local or regional expert and decision-maker regarding RE projects, and getting media attention from the local press, as the topic is positively connoted.

parts of the RECP revenue to pay for REPC or RE related apprenticeships, schoolings and congresses (Behr 2013; Gottwald 2013; Janik 2013; Kühn 2013) as well as compensating for REPC related personal costs of active members, e.g. driving costs (Behr 2013; Staab 2013a). Paying for interesting and useful seminars or apprenticeships can in turn be also beneficial for the REPC in the long run, as active members can learn additional knowledge and apply it to the future development of the REPC, especially if the seminars are about new financing or marketing models for RE-systems (Elpers 2013). For a small REPC it is not really necessary to formalize such a system, since it is easier to handle it informally between the management and advisory board in one of the regular meetings. A formalized non-monetary incentive system is actually rarely purposefully created within a REPC but rather fulfilled in an ad-hoc manner (Elpers 2013; Gottwald 2013). To assess the level of extrinsic motivation among the active members of a REPC, it is useful to find out if a REPC is either already operating an informal or formal non-monetary incentive system or the REPC plans to operate one in the future. Therefore, two indicators are proposed here, namely (a) the presence of a non-monetary incentive system and (b) plans to introduce a non-monetary incentive system.

#### 2.2.2.2.3 Overview of the dependent variable extrinsic motivation

Table 4 provides an overview on the dependent variable extrinsic motivation and the respective sub-variables confidence in future benefits and non-monetary incentive system, including the indicators for the respective sub-variables.

Table 4: Overview of the sub-variables and the indicators for the dependent variable Extrinsic Motivation

| Sub-variables                 | Indicators   |
|-------------------------------|--|
| Confidence in future benefits | 1) Level conviction that personal engagement in the REPC is important<br>2) Level of personal benefit expectations from engagement |
| Non-monetary incentive system | 1) Presence of a non-monetary incentive system<br>2) Plans to introduce a non-monetary incentive system                            |

### 2.3 The independent variable support by intermediary organizations

It is now moved to identify the independent variables that are assumed to influence the founding processes and durable collective action capacity of REPCs. Research on the role of intermediaries in the founding process and in fostering durable collective action capacity of REPCs is scarce. Since this research aims to assess and investigate the influence of intermediary organizations on both dependent variables, intermediary organizations in the field of REPCs are defined in the following. Most notably, intermediary organizations are distinguished into support organizations (SOs) and partner organizations (POs), which provide different forms of support and link different intentions to their support. After this, these different forms of support are outlined and conceptualized.

#### 2.3.1 Intermediary organizations in the context of REPCs

Intermediary organizations in the context of REPCs can broadly be defined as being engaged “in work that involves connecting local projects with one another, with the wider world and, through this, helping to generate a shared institutional infrastructure” (Hargreaves et al. 2013, p. 870), thereby supporting the development of REPCs. Intermediary organizations have in practice provided support to the founding process and the further development of REPCs. To date, however, the role of intermediaries in providing such support has received little scientific attention. The only study that touched upon the topic to date was undertaken

by Hargreaves et al. (2013) in which they analyzed 113 case studies provided by intermediary organizations in the UK community energy sector. Hargreaves et al. (2013) identify three types of intermediary organizations that support the founding and the further development of community energy projects, namely governmental agencies, local/regional/national NGOs and the private sector. While the forms of support that Hargreaves et al. (2013) identified were useful to identify indicators for the forms of support in this research, the differentiation of intermediaries is only partially adopted.

Two types of intermediary organizations are identified based on their primary purpose and on their respective motives to support the interest group and later the REPC: support organizations (SOs) on the one hand, which represent general cooperative associations and REC associations. On the other hand, partner organizations (POs) include local government agencies and market actors that can also provide financial support to the founding and further development of REPCs. In this research a study on support organizations' role in NGO-based civil society action by Brown and Kalegaonkar (2002, p.239) is used to define SOs in the context of REPCs and to identify the main variables of SO and PO support. In the following, the definitions and main characteristics and goals of first SOs and then POs are outlined.

### *2.3.1.1 Definition of support organizations*

Brown and Kalegaonkar (2002, p.239) defined SOs as “value based agencies whose primary task is to provide services and resources that strengthen the capacities of their constituents to accomplish their missions”. Generally, SOs serve five broad support functions: (1) strengthening human and organization capacities, (2) mobilizing material resources, (3) providing information and intellectual resources, (4) building alliances for mutual support, and (5) enabling bridging to other sectors (Brown & Kalegaonkar 2002). While many SOs serve more than one of these functions, they often start out as providers of one or two kinds of support. In order to fulfill their support functions SOs may “provide training and staff development services, research and information resources, networking and alliance-building support, financial resources, or policy analysis and advocacy support” (Brown & Kalegaonkar 2002, p.239). In line with Brown and Kalegaonkar (2002), a SO in the context of REPCs is here defined as a value based agency that not only provides services and resources to strengthen the human and organizational capacities of a local interest group to found a REC and/or to implement a first renewable energy project, but also to support the further development of the REPC to accomplish its respective mission.

As Brown and Kalegaonkar (2002) pointed out, many grass-root initiatives or local NGOs face certain internal and external challenges<sup>64</sup>. One of the internal challenges that also interest groups or REPCs potentially face is amateurism. People that are inexperienced with business plans and financial planning will hardly be able to conduct the founding process and to implement a project, therefore they either need to find someone able and willing to join or look for external help (Kühn 2013). Although many interest groups may have motivated members that are driven by a common goal and in the best case hold the basic technical, financial and legal knowledge to implement a PV-project, they often lack expertise regarding the management, legal form and the organizational structure and procedures of a cooperative (Elpers 2013; Gottwald 2013; Staab 2013a; Staab 2013b; Voigt 2013).

In this research SOs for REPCs comprise cooperative associations that act as a facilitator in the founding process and the further development of the REPC and support it with subject-specific expertise and skills. This includes general cooperative associations that aim to foster the development of cooperatives and the cooperative idea independent of

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<sup>64</sup> For a complete overview see (Brown & Kalegaonkar 2002, p. 238).

their business field<sup>65</sup> and specialized cooperative associations that focus on supporting cooperatives with respective expertise in specific business areas<sup>66</sup>. While general cooperative associations in the context of a REPC are able to give financial and cooperative organization-related advice, they cannot answer specific technical questions, such as on the quality of certain PV-sellers (Gottwald 2013). For example, REC associations usually hold more RE-specific expertise than a general cooperative association, which makes REPC-specific associations more suitable and responsive to the needs of REPCs (Staab 2013b). The focus in this research lies on the latter type of cooperative association, i.e. REC associations.

### *2.3.1.2 Definition of partner organizations*

POs are different from SOs in that they may get involved in the establishment of a REPC or its further development for various reasons. Thus, while they can potentially play an important role as partners for the cooperative, supporting REPCs is not the primary task of a PO, as opposed to the SOs. There are two different types of POs: local government agencies on the one hand and market actors on the other, which can both play an active role in the founding process and the development of a REPC, either as co-founders or facilitators. While local government agencies include municipal governments, city and village councils, market actors comprise local banks<sup>67</sup>, public<sup>68</sup> and private<sup>69</sup> utility companies (Flieger 2013b; Flieger 2011b; Gottwald 2013; Janik 2013; Voigt 2013). The involvement of those POs may occur for various reasons and while they can potentially play an important role as partners for the REPC, supporting them is not the primary task of a PO, as opposed to the aforementioned SOs. Motivations of POs to assist the development of REPCs, besides value-based motivations<sup>70</sup>, can for example include image-building, customer acquisition and accessing new market opportunities. While all POs can potentially be motivated to create a partnership with a local REPC by image-building gains, public and private utilities and local banks can especially be motivated by the perspective of customer acquisition and accessing new market opportunities (Flieger 2013b; Gottwald 2013; Hargreaves et al 2013; Herbers et al. 2010). POs usually lack the expertise regarding the legal form of and the founding process of a cooperative and connected issues. Nevertheless, they can still assist or conduct organizational tasks in the founding process and the later development of the REPC, depending on their respective expertise. Therefore, PO involvement does not necessarily exclude the additional involvement of a SO, and in some cases combinations are quite common<sup>71</sup>.

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<sup>65</sup> See for example the national German cooperative association DGRV (DGRV 2013b) or the national French cooperative association Les Scop (Les Scop 2013).

<sup>66</sup> See for example the German REC association in Baden-Württemberg (VBBW 2013), the European REC association REScoop in Belgium (REScoop 2013) or the European association of cooperative banks (EACB 2013).

<sup>67</sup> See for example Energiegenossenschaft Odenwald (2013).

<sup>68</sup> See for example the REPC BEG Wolfhagen (2013).

<sup>69</sup> See for example the REPC Die Bürgerenergie eG that was founded in close cooperation with the RWE Deutschland AG (Die Bürgerenergie eG 2013).

<sup>70</sup> For example, cooperative banks may want to foster local cooperatives in the 'cooperative spirit' or public utilities may want to foster the creation of local added value.

<sup>71</sup> In Germany, for example, a lot of cases can be found where staff members of local cooperative banks initiated and organized the founding process of REPCs by cooperating with the respective regional cooperative auditing association, making use of staff provision and using their information packages on the founding event (Gottwald 2013; Staab 2013b; Janik 2013; Voigt 2013).

### **2.3.2 Support provided by intermediary organizations**

This section describes the support provided by intermediary organizations. It is hereby distinguished between the support provided by SOs and the support provided by POs on the one hand and between the support the respective organization provided to the founding process and to the further development of REPCs. Accordingly, first the support of SOs will be outlined. It comprises (a) provision of research and informational resources, (b) advocacy support, and (c) networking or alliance-building support. Secondly, the support provided by POs will be described. It encompasses (a) financial support, (b) advocacy support, and (c) networking or alliance-building support.

#### *2.3.2.1 Support organization assistance in the context of REPCs*

Both types of cooperative associations, SOs and POs, generally have a strong focus on the founding process of cooperatives, in which they assist them with research and information resources and advocacy support. As members of the SO, REPCs receive further assistance after their establishment through more research and information resources, networking and alliance-building support and ongoing advocacy support. These forms of support often highly vary in practice not only depending on the needs and skills of the initiating actors of a REPC, but also on the respective capacities of the support organization (Gottwald 2013; Janik 2013).

Generally, the provision of research and information resources may include the provision of ideas for new projects, tools, expert perspectives and information on relevant policy developments (Bakker et al. 2012; Brown & Kalegaonkar 2002; Hargreaves et al. 2013). Especially cooperative associations<sup>72</sup> can provide interest groups with tools such as information packages that include important documents for the founding process, such as formal papers needed for the founding process, sample code of conducts, sample business plan, sample roof leasing contracts and a step-by-step founding manual that shows in which phase what steps are important and what issues need special attention (Gottwald 2013; Janik 2013; Voigt 2013). Although the development of a business plan or a business case for a specific project depends on the prior knowledge of the interest group members, sample businesses plans and business cases can also significantly help interest groups in formulating each and adapt them to their respective needs (Behr 2013; Elpers 2013; Kühn 2013; Staab 2013a; Voigt 2013).

In terms of on-going provision of information and resources after the establishment of the REPC, a SO can offer apprenticeships and seminars on general cooperative related topics, e.g. on how to optimize the work processes between the management board and the advisory board, or REPC-specific topics, e.g. direct marketing of PV-electricity, etc. (Gottwald 2013; Janik 2013). Especially the provision of information on new RE-marketing models can be very useful to active members of REPCs. Developing new marketing models is very important for REPCs as the RE market has been and is currently undergoing rapid changes that pose not only challenges but also opportunities for accessing new business models (Janik 2013). Due to time constraints most active members of voluntarily managed REPCs are simply not able to develop new marketing models on their own and that is why they need models that have already been successfully tested in practice by more advanced REPCs<sup>73</sup> (Elpers 2013). Along those lines SOs may also assist in strengthening the organizational development of a REPC by providing research and information resources in the form of sample work protocols for curricular meetings, sample rules of procedure for the management and advisory board, i.e. on how decision-making can be optimized in this

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<sup>72</sup> Other SOs can do this, too, but they usually get cooperative-specific knowledge from cooperative associations, since they usually lack expertise in this field (Flieger 2013b).

<sup>73</sup> See for example Energiegenossenschaft Odenwald (2013); HEG (2013).

context, etc. (Gottwald 2013). Many SOs also send frequent newsletters with general information and important advice on relevant policy developments. Especially changes regarding specific laws can be important, as not every REPC has a lawyer in their midst that can judge the consequences of specific amendments. Non-professional REPCs usually do not have the manpower to deal with very specific topics, like changes in for instance cooperative or capital investment laws or new marketing models for renewable electricity. Therefore, it is one of the central tasks of a SO to process those complicated issues for REPCs, and thus to create an awareness for those issues to enable the REPCs to focus on their core business and on how to prepare their REPC accordingly, when needed (Gottwald 2013; Hargreaves et al. 2013; Janik 2013).

A more direct or active forms of assistance that SOs can provide, is advocacy support. A SO can send out staff to personally host the founding event if requested, to make sure all legal formalities of the founding event are compiled to WHAT? and that the concept for the REPC is professionally presented (Gottwald 2013; Janik 2013). This supplies the founding event and thus the founding members with legal security, wherefore this service is gladly accepted by many REPCs (Janik 2013; Kühn 2013). Advocacy support in the founding process may also include the promotion of the founding event through press agencies owned by SOs. This encompasses the sending of press releases to local and regional newspapers to attract potential members as well as web pages to gain further information and/or where potential members can indicate their interest and how much they would be willing to invest in the REPC. SOs can thereby also indirectly assist in generating internal capital (Gottwald 2013). They can further make staff available for consultation regarding the founding process and/or issue-specific problems and questions<sup>74</sup> in the later development of individual REPCs, if requested. This can include phone consultations, proofreading of important founding documents, scheduled meetings<sup>75</sup> between support organization staff and respective interest groups or management or advisory board members of already established REPCs (Gottwald 2013; Janik 2013).

Networking or alliance-building support comprises the provision of opportunities to share information and ideas and to organize collective initiatives with other organizations by providing structures that facilitate discussion, enable coordination where joint action is needed and promote shared understandings on important issues (Bakker et al. 2012; Brown & Kalegaonkar 2002; Hargreaves et al. 2013). Accordingly, SOs in the context of REPCs can provide opportunities to share information and ideas and to organize collective initiatives for REPCs through frequent annual meetings, where SO staff members or expert guest speakers give presentations on new technologies, recent economic and policy developments, new marketing models for renewable energy technologies etc., depending on the demand of its member REPCs. Here the members can also exchange experiences and ideas and discuss future projects and possibilities to cooperate on larger renewable energy projects (Gottwald 2013; Janik 2013). This exchange can be very fruitful for REPCs as they can not only learn from one another, but also make sure that they either do not get into each other's way or cooperate regarding larger future projects in their region. The knowledge transfer can be especially beneficial for smaller or new REPCs as they can learn from the experiences of the already established and larger REPCs (Kühn 2013; Voigt 2013). Besides assisting REPCs in connecting to each other, SOs can also help them in connecting to partners in other sectors, such as local government agencies and private businesses that can also facilitate the founding process and the development of a REPC. Here the SO usually

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<sup>74</sup> This may include financial, technical and/or legal issues.

<sup>75</sup> It is important to note that the number of scheduled meetings that are free of charge is generally limited, i.e. after around 2-3 extensive consultations, support organizations may charge the interest group for further meetings, which only applies to cooperative audit associations in most cases (Janik 2013; Gottwald 2013).

directly contacts the PO for a meeting to present the idea of founding a local or regional REPC in order to involve the organization as a member of the REPC and/or to receive additional support (Gottwald 2013; Janik 2013; Hargreaves et al. 2013).

In summary, SO support includes (a) provision of research and informational resources, (b) advocacy support, and (c) networking or alliance-building support.

### *2.3.2.2 Partner organization assistance in the context of REPCs*

There are different forms of support POs can provide to the founding process and the maintenance of a REPC. First of all, both types of POs can financially support the REPC by mobilizing internal funding for projects (Flieger 2011b; Flieger 2009). They can realize this by becoming a member of the REPC and thus co-investing in the cooperative and/or through advocacy support in terms of public relations for the REPC and its projects to attract potential members in the community. When municipalities become co-founders, often the mayor or another city/village official gets elected into the advisory board of the cooperative as a representative of the community. POs can also help indirectly in the generation of external capital from local banks<sup>76</sup> for projects, by for example invoking legitimacy in the community as trustable partners of the REPCs, based on their respective expertise and reputation (Flieger 2013b). In some approaches where SOs and POs conjointly support the founding process, private utility company POs even directly provide financial support for the founding process of REPCs by covering incurred costs (e.g. costs of auditing organizational documents, registration costs, rent for the room where the founding event is held) or later in the planning of the first project, such as auditing costs for the system, approval certificates etc. (Flieger 2011c; Janzig 2010; Zeit Online 2013).

Depending on their respective expertise, POs can also provide advocacy support similar to SOs for the founding process and the development of their partner REPC. In this context, especially public and private businesses can actively strengthen the organizational and leadership skills of an interest group and the subsequent REPC through the provision of staff. Here the PO often initiates or is invited by an interest group to co-initiate the REPC and provides staff as co-founders of the REPC (Flieger 2011c; Flieger 2013b; Staab 2013b; RWE Effizienz 2013; Voigt 2013; Zeit Online 2013). The staff members are directly involved in organizational issues, (co-)formulating the code of conduct, the business plan, contracts and other legal documents (Voigt 2013). As co-founders, staff members of the PO usually get elected into the management or advisory board of the REPC. The staff of a public or private utility for example is likely to provide reliable technical expertise on the respective projects, while staff members of a local bank can provide sound advice on financial and taxing matters of a REPC's projects (Flieger 2013b; Staab 2013b; Janik 2013; Voigt 2013). This approach is generally taken by local banks as well as private and public utilities and sometimes the elected management board members that have been released for the REPC are kept on the pay roll of the PO, providing the REPC with a full-time management board (Flieger 2013b; Voigt 2013). Municipalities usually refrain from this approach, as the current budget crisis in many municipalities does not allow for financial support of the REPC management board (Voigt 2013).

In its own right, local municipalities and in some cases the mayor of a municipality can be an important driver in the founding process either as co-founders and/or facilitators. Municipalities can also provide advocacy support by taking the role of promoters, since they have better access to large parts of the community and can thus make it easier to convince a larger number of citizens to join the local REPC. They can for example organize a city or village council meeting or a local congress on climate change, and potentially invite a SO, to

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<sup>76</sup> If the bank is a partner, in terms of co-founding or facilitating the REPC, it is also very likely that the REPC receives the external capital for projects from the same local bank.

explain the general concept of PV-cooperatives and their benefits in terms of the generation of regional added value connected to the implementation of locally owned renewable energy systems<sup>77</sup>. They may also inform the local citizenry with news bulletins about the project (Janik 2013). Moreover, they can provide the interest group with space for informational events and the founding event free of charge to save costs in the founding process.

Next to promotion and networking, the municipalities can also provide the public housing stock for PV-projects, either at low renting costs for roofs or free of charge, which ensures a faster implementation of the projects and lower cost in the founding process and potentially also for future PV-projects (Flieger 2013b; Voigt 2013). Especially for larger RE-projects the involvement of a municipality can be beneficial for the REPC, since municipalities can designate public land as plots for free-standing PV-systems above 1 MW, a wind farm, a local heating grid, a biogas plant and other large RE-technologies (Behr 2013; Janik 2013; Voigt 2013). Moreover, in terms of project realization, the involvement of a municipality can give the RE-projects or the REPC a higher legitimacy and credibility among the local citizens, especially if the support is across all political fractions and not dominated by single political actors or fractions (Janik 2013; Voigt 2013). Even if the municipality is not a member of the REPC or a co-investor of a wind farm or local heating grid project, it can still profit from the lease of land. However, it can also be a problem for the REPC, when elected officials in the advisory board prefer a certain technology for political reasons, e.g. when his/her voter base forms an anti-wind farm initiative (Staab 2013a). Nevertheless, it has to be noted that although the support of a municipality is generally helpful for the founding and the development of a REPC, it is not a requirement for a successful founding process, as many REPCs that have no municipality involved as a member or a facilitator also all managed to establish their REPC and to realize their projects (Gottwald 2013; Janik 2013).

In summary, PO support encompasses (a) financial support, (b) advocacy support, and (c) networking or alliance-building support.

## *2.4 Visualization of the theoretical framework*

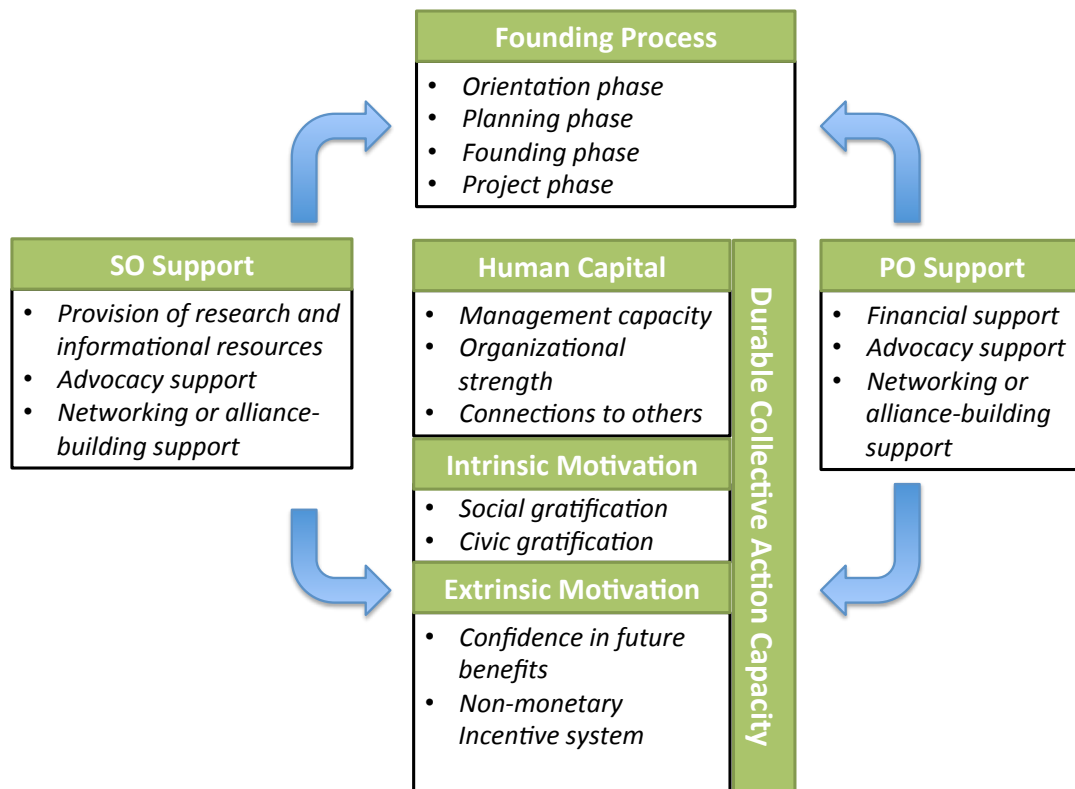
For an overview of the established independent and dependent variables that enable the assessment of SO and PO support on the founding process and durable collective action capacity, the illustration of the theoretical framework is presented in figure 4. The left and right boxes represent the independent variables SO support and PO support that are expected to have a positive impact on the dependent variables. In the middle of the figure are the dependent variables *founding process*, with the respective sub-variables *orientation phase*, *planning phase*, *founding phase* and *project phase*, and *durable collective action capacity*, with the respective sub-variables *human capital*, *intrinsic motivation* and *extrinsic motivation* and their respective indicators. The analysis will enable to show more clearly which indicators of the dependent variables are influenced by specific forms of support provided by SOs and/or POs.

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<sup>77</sup> Similar approaches can also be taken by local banks, especially cooperative banks which are usually well connected to a respective cooperative association. Here the cooperative bank can also invite the SO for an informational event or invite them to give a presentation to the city/village council (Janik 2013).



Figure 4: Theoretical framework to assess the impact of SO and/or PO support on the founding process and on the durable collective action capacity of a REPC



## 3. Methodology

In this section the methodological approach of this research will be presented. It starts with the research strategy, followed by the research design and methods that help to answer the research question. Subsequently, the case selection is explained in order to show how and why the cases were selected. This is followed by an account of the data collection in this research, in which it becomes clear how the information for this research was obtained and analyzed. In the last part of the methodology section the operationalization of the variables is presented.

### *3.1 Research Strategy*

Since this research is rather exploratory in nature, a comparative case study (Gerring 2004) is conducted that contains four cases, including two REPCs without and two REPCs with support by intermediary organizations, more specifically SO and PO support, in order to gain in-depth insights on different forms of support, their impact on the founding process and their utility to strengthen the durable collective action capacity of REPCs. Case studies are an important method in social science research. They can be used to illustrate, validate and explore theoretical concepts and hypotheses, as they support detailed observations to describe, understand and explain the issue under investigation in its specific context (Gerring 2004; Hulme 2007; Yin 1981). Due to the complexity in SO and PO support as well as in the founding process and to establishment of REPCs, detailed process tracing is required. The qualitative assessment of the case studies is additionally supported by a quantitative survey. The survey is not used to draw statistically meaningful inferences but to substantiate the qualitative data.

Qualitative research involves problems of personal bias of the researcher, generalizability, consistency and neutrality of the respondents. Regarding generalizability, case study research usually allows for high internal validity, while external validity is limited. Conclusions are therefore not generalizable. A comparative case study can increase external validity, because additional cases may give greater weight to the conclusions (Gerring 2004; Hulme 2007). The quantitative survey also included REPC cases with and without SO/PO support. However, the limited number of case studies in this research renders the external validity still very limited.

Case studies are especially useful to yield insights into causal mechanisms rather than causal links (Gerring 2004). The detailed exploration of each variable enables conclusions on the causal mechanisms underlying the SO/PO support and the founding process and durable collective action capacity of the REPCs. The establishment of the relationships between the variables was ensured by the questions asked during the interviews and in the survey (see 3.3 below). In order to support the conclusion on the causal links between support and founding process and durable collective action capacity, as implied above, the comparative case study includes not only two cases of PO and SO support, but also two cases without such support. This enables to compare the results of the sample group (PO/SO support) with the results of the control group (no PO/SO support) in terms of support provided/otherwise obtained and its results on the founding process and the durable collective action capacity of the respective REPCs.

### *3.2 Case selection*

Because of the rapid increase and success of RECs in Germany and the country's unique frontrunner position in terms of institutional support for the energy transition, this research focuses on German RECs. As has been established before (see 1.1), this research specifically considers REPCs, because they represent the large bulk of RECs. The cases further included

REPCs with (sample group) and REPCs without SO and PO support (control group). Notably, SO and PO support took place simultaneously in the sample group.

In order to select comparable cases, certain requirements have to be fulfilled that enable the exclusion of external influences on the variables under investigation. Accordingly, all cases of REPCs with and without SO/PO support were chosen based on the following criteria: (1) material conditions, (2) attributes of the community<sup>78</sup> and (3) the formal rules-in-form<sup>79</sup> (Ostrom 2007) to keep possible external influences on the dependent and independent variables as constant possible.

In order to keep relevant material conditions constant that may affect the answers of REPC representatives in the questionnaire and later in the semi-structured interviews, only REPCs were selected that started with PV-projects and have not realized a larger RE-project before 2012. This way, differences that may occur due to respective socio-technical issues of different technologies (Rogers et al. 2008; van der Horst 2007; Sauter & Watson 2007; Walker 2008; Walker & Cass 2007) that could potentially affect the relevance of SO and PO support in the founding process or specifically the perceived management capacity of a REPC, are ruled out. Moreover, many REPCs in Germany start out as PV-REPCs, as PV represents the least demanding technology in terms of financing, project planning and implementation (Flieger 2011b; George & Berg 2013; Holstenkamp 2010; Staab 2013), which is advantageous for active members that work on a voluntary basis, since it is less time consuming. With 431 out of 754 registered RECs<sup>80</sup>, REPCs producing electricity on the basis of PV-systems also represent the largest group within RECs in Germany, with most of them located in Baden-Württemberg and Bavaria (Holstenkamp & Müller 2013). Moreover, setting up a wind turbine or a biogas plant also requires more financial investments, technical expertise and negotiations with neighboring residents (Staab 2013; George & Berg 2013).

To ensure that temporally differing formal-rules-in-use did not affect the independent and dependent variables, for both the sample and interest group only REPCs were selected that have been founded after 2006, when the German cooperative law was amended to facilitate the establishment of cooperative business models (GenG 2006). Amendments concerning the degression of feed-in tariffs (FiTs) for PV-installations between 2006 and April 2012 will not be regarded as having a significant impact on the independent variables for the following reasons. First of all, the bi-annual degression followed an ongoing and steep drop in costs per installed kWh between 2006 and today, i.e. from 5.000€/installed kWp in 2006 to 1.709€/installed kWp<sup>81</sup> (BSW-Solar 2013). Some REPCs even managed to introduce direct-marketing models, where the respective feed-in tariffs only plays a marginal role in generating income<sup>82</sup>. Secondly, the unprecedented founding boom of REPCs based on PV-electricity in Germany in the last couple of years<sup>83</sup>, with a growing number of annual establishments since 2006, suggest that the decreasing feed-in tariffs within the EEG until April 2012 only played a negligible role. With the EEG 2012 however, that came into effect on 1<sup>st</sup> April, a new FiT-system with more frequent degression in FiTs for PV per year was introduced that brought insecurities in the investment climate for FiT-based

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<sup>78</sup> This includes generally accepted norms and behaviors, level of common understanding and homogeneity in preferences (Ostrom 2007).

<sup>79</sup> Here this refers to formal institutions such as the German renewable energy act or cooperative law.

<sup>80</sup> Status as of December 2012 (Holstenkamp & Müller 2013). Up to date there are around 880 RECs in Germany (Kayser 2014).

<sup>81</sup> Includes all cost of purchase and full installation of the system and refers to household systems below 10 kWp. The respective price per installed kWp decreases with the increasing size of a PV-system.

<sup>82</sup> For further information see for example the REPC in Heidelberg, Germany (HEG 2013).

<sup>83</sup> For further information see section 4 or (DGRV 2013).

PV-projects and put REPCs under pressure in terms of available time to plan and implement a project, before the next degeneration would come into effect (Volz 2012; EEG 2012). Therefore, the formal-rules-in-use with relevance to REPCs until 1<sup>st</sup> April 2012 are treated as constant here, while the amendments that came with the EEG 2012 are thought to have impacted the founding of new REPCs<sup>84</sup> and the management capacity of existing REPCs in terms of realizing FiT-based PV-projects after the reform. Accordingly, the development and policy debates about the EEG that started in early 2012 were considered as explanatory factors in the analysis of the obtained data.

In order to keep the attributes of the community constant, only REPCs in the federal states of Baden-Württemberg and Bavaria were selected as potential participants in the survey. Both federal states are quite similar in terms of their socio-economic situation and social structure of the citizenry and their physical conditions. In comparison to other German federal states they have a relatively high-sun radiation and only low to medium wind energy generation potential. Additionally, only REPCs were selected that have been established in municipalities with less than 30.000 inhabitants. Thus, the focus lies on REPCs in rural or small town communities. This helps to keep the attributes of the community constant in this research, as the social conditions are quite similar in comparison. Moreover, it also has a practical reason since most REPCs have so far been established in this type of communities (Maron & Maron 2012). This way the potential to gain more responses for the questionnaire increases, as more potential cases are available.

As stated above, the selected cases are separated into a sample (SO/PO support) and a control group (no SO/PO support). In order to narrow down the focus and to explore the role of both SO and PO support, the sample group in this research consists only of institutional-organizational REPCs<sup>85</sup>, where both a REC association (SO) and one or more POs were involved in the founding process. Therefore, the sample group includes member REPCs of the REC association – representing the SO – Verband der BürgerEnergiegenossenschaften Baden-Württemberg (VBBW) and are thus limited to Baden-Württemberg. The focus on members makes sure that all selected REPCs had some kind of support on the founding process, since members of the VBBW all received support in the establishment of their cooperative from the association and from a large German energy utility company, the EnBW Regional AG (EnBW). The EnBW therefore constitutes the PO of the REPCs of the control group. The VBBW is independent from, but closely connected to the EnBW Regional AG and carries out part of the support for the founding process of a REPC, together with the energy provider through a joint founding concept (Flieger 2013b; VBBW 2013; Strobel 2013). Currently the VBBW has more than 60 member REPCs in the federal state of Baden-Württemberg (VBBW 2013). Nevertheless, only 38 members that fulfilled criteria mentioned above, were taken into consideration and asked to fill out the questionnaire in order to ensure comparability and generalizability of the expected results.

The control group consists of civic-ecological and socio-political REPCs where no SO in form of a REC association or PO was involved in the founding process and that are not members of a REC association. The selection was based on their locality and an inspection of various homepages of REPCs that are listed in an online index for RECs in Germany (Energiewende Jetzt 2013b). The inspection of the respective homepages included research on the founding history and members, where available, and on online newspaper articles for further information, to see if a REC association or PO was involved in the founding process or if the REPC is a member of a REC association. Cases in which it was not clear whether a

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<sup>84</sup> For more detailed information see section 4.

<sup>85</sup> REPCs that were provided with a professional full-time management board by POs are excluded from this research, as they are hardly comparable to both voluntarily managed REPC with or without SO and/or PO involvement in the founding process, in terms of the proposed variables and their implications.

REC association or a PO was involved in the founding process were excluded from the selection. For reasons mentioned above, only civic-ecological and socio-political REPCs in the federal states of Baden-Württemberg and Bavaria were chosen for the control group. Questionnaires were sent out to 39 REPCs, that either showed characteristics of civic-ecological or a socio-political REPCs.

As mentioned above, four semi-structured interviews were held with representative founding and management board members of participating REPCs from the control and the sample group. They were conducted based on a further selection of two institutional-organizational REPCs that had SO/PO support and a civic-ecological and a socio-political REPC without SO/PO support. All of them had participated in the survey. Interview partners of the sample group, here referred to as case A and B, were selected on the following basis. Case A was selected since they scored both highest regarding the level of difficulty of the founding process and the utility of SO and PO support in the founding process. Additionally they scored the highest on human capital and specifically management capacity. Case B was selected since it scored the lowest both regarding the founding process and the utility of the SO and PO support. Moreover, they also scored the lowest on the variable human capital, specifically the perceived management capacity in comparison to other participants of the sample group. Interview partners for the control group, here called case C and case D, were selected on the same basis: Case C was selected since they scored comparably high on founding process and the highest regarding human capital. Case D, on the other hand, scored both comparably low on the founding process and also on the level of human capital. The large omission of the variables intrinsic motivation and extrinsic motivation in the comparison of the cases is due to the results of the questionnaire, which showed that the SO and PO support had no influence on these variables, and will become more clear in the analysis. This selection of case studies was undertaken to secure comparability between the cases, as for the sample and control group one poorly and one well-scoring case was chosen. Notably, the survey proved instrumental in this additional case selection.

### *3.3 Data collection and analysis*

As reflected in the research framework (figure 2, see 1.3), different methods were used to gather the relevant information for answering the research questions and thus to fulfill the respective research objectives. In order to arrive at robust conclusions and recommendations this research aims for triangulation of data sources (Verschuren & Dooreward 2010) by including desk research, a survey of REPC management board and founding members, and semi-structured interviews in terms of expert consultations and interviews of active members of the cases chosen from the survey participants to gain additional in-depth insights. This way it can be ensured that all relevant perspectives regarding the impact of SO and PO support on the founding process and the durable collective action capacity in the context of REPCs are taken into account, thus increasing the validity of the overall results and conclusions. Table 5 provides an overview on the respective data gathering method, goal(s) and perspective(s) taken into account. The differentiated data gathering method steps correspond to phase 1 to 3 of the research framework (figure 2, see 1.3), as also indicated in the table.

Table 5: Triangulation of data gathering methods and perspectives

| Data gathering method  | Goal(s)  | Perspectives  |
|--|--|---|
| Literature review (research phase 1)                                   | Developing a preliminary theoretical framework   | <b>Scientists:</b> collective action theory, community renewable energy and REPC literature, literature on human capital, motivation and voluntarism  |
| Semi-structured interviews (expert consultations) (research phase 2)   | Revision/expansion/completion of the first theoretical framework and operationalizing it in the context of REPCs   | <b>Experts and practitioners</b> in the field of cooperatives and REPCs   |
| Surveys (research phase 3)   | Obtaining data to:<br>a) Gain insights on how difficult the fulfillment of the necessary tasks and accordingly how useful the support in those tasks was in the founding process<br>b) Gaining insights on the durable collective action capacity of participating REPCs<br>c) Compare the respective scores of different REPCs, in detail on the basis of the respective scores on the indicators for the founding process and the durable collective action capacity, to identify similarities and/or differences of the two groups and to select the cases for the case study on the basis of the results | Representative <b>members of the management board</b> of participating REPCs, with and without SO and PO support, that have been involved in the founding process of their REPC                                 |
| Online research (research phase 3)                                     | Gaining additional data from cases that did not participate in the survey, i.e. installed PV-capacity, latest project and latest project planned   | n.a.  |
| Semi-structured interviews (case study respondents) (research phase 3) | a) Back up the obtained data from the questionnaires<br>b) Gain deeper insights on establishing and running a REPC, with and without SO and PO support<br>c) Gain specific insights on the utility of specific SO and PO support for REPCs, to be able to make direct connections to the dependent variables   | Representative members of the management board of participating REPCs, with and without SO and PO support, that have filled out the questionnaire and have been involved in the founding process of their REPC. |

Following research phase 1, the establishment of the preliminary theoretical framework, the extensive literature review on the initiation and the expected durability of collective action in collective action organizations, community renewable energy, REPCs, human capital, motivation and voluntarism helped to develop a preliminary theoretical<sup>86</sup> framework with first variables and indicators for SO and PO support, the founding process and durable collective action capacity of REPCs.

In research phase 2, the finalization of the theoretical framework and the construction of the questionnaire, semi-structured interviews with experts and

<sup>86</sup> For an overview on the dependent and independent variables based solely on the literature review see Appendix 1.

practitioners<sup>87</sup> were held. In order to reach experts and practitioners to conduct the interviews to obtain the necessary feedback for the theoretical framework, contacts were established via E-mail and phone calls. In total eight semi-structured phone interviews were held with experts and practitioners in the fields of REPCs. An additional interview was held with the head of the management board of the VBBW (Strobel 2013), to gather insights on the VBBW and EnBW Regional AG support concept for the analysis. In order to not influence the answers of the participants, at first open questions regarding the founding process and long-term involvement of active members were asked. This especially helped to generate additional variables and indicators that could not be identified in the literature. Subsequently, questions that were constructed on the basis of the first draft of the theoretical framework to enable either confirmation of the assumptions made for the context of REPCs or their rejection. The interviews helped to revise variables and indicators that have been developed on the basis of the literature review and to translate them into the context of REPCs. Moreover, the interviews helped to obtain further insights to identify additional variables and indicators. Most importantly, variables collected from the literature could be connected with the specific context in which a REPC is founded and managed, thus providing relevant information for developing a survey with closed questions for research phase 3. For this the theoretical framework was operationalized.

Two surveys have been developed, one for the sample group and one for the control group<sup>88</sup>. The questionnaires are almost identical, but with the important difference that the questionnaire for institutional-organizational REPCs contains additional questions to identify in which task of the founding process the support from the VBBW and EnBW was useful and in which it was not, and were it was not present. All questions or statements in the questionnaire are formulated in a way that they are understandable and appropriate for the potential respondents and scientific jargon is held at a minimum, as the social and professional background of REPC members vary widely. The surveys were set up as an online survey to facilitate the data collection from the REPCs. To make sure that only active members that were involved in the founding process participated, e-mails were sent to the REPCs, explaining that only one representative executive board member that was also present in the founding process should answer the survey, by following a link to the online survey that was provided in the e-mail. In total three<sup>89</sup> emails have been sent out to the potential participants with an interval of about four to six weeks.

In research phase 3, the establishment of a data base for extensive analysis, the survey helped to obtain an overview on how difficult or easy it was for REPCs, with and without SO and/or PO support, to establish their respective REPC and on the level of durable collective action capacity, i.e. human capital, intrinsic and extrinsic motivation. Moreover, the extra questions in the survey for REPCs with SO and PO support helped to find out in which stages and respective tasks of the founding process the support of a SO and PO was especially useful for the interest group. While waiting for the survey responses, websites of the sample group and control group have been scanned for information on installed PV-capacity, number of realized projects, date of the latest installment and activity, as well as type of the latest RE-projects and plans to realize new RE projects. After the survey was closed, the data obtained from the online research have been updated where necessary with data obtained from the questionnaire. However, updates were only necessary for two participants of the control group as all the other REPCs' homepages were up to date and

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<sup>87</sup> For an overview on the experts and practitioners and their backgrounds see Appendix 6. For an overview on the interview guides used see Appendix 7.

<sup>88</sup> For an overview of the questionnaire questions see Appendices 2, 3 and 4.

<sup>89</sup> Additionally the head of the VBBW was contacted for support, after only a few members REPCs of the VBBW answered and sent out a forth notification in their newsletter, unfortunately with no effect on gaining further participants.

data for the indicators installed capacity (sample group N= 27; control group N= 28) and type of latest installed project (sample group N= 37; control group N= 33), was available in most cases. Additional online research was conducted to gather data for cases that did not take part in the survey to support the quantitative data pool, so that some more generalizable insights regarding the collective action capacity of both the sample and the control group could be obtained on the basis of the REPCs' factual activity in recent years.

After the data from the research and questionnaires was analyzed and adequate cases were selected, semi-structured interviews with four selected interviewees, two being active members in a REPC with SO and PO support (i.e. VBBW and EnBW, respectively) and the other two being active members in a REPC without SO/PO support<sup>90</sup>. First of all, all participants were asked to describe their founding process and the background of their interest group. Moreover, they were asked to describe the role of the municipality and the respective regional cooperative associations<sup>91</sup> in their founding process and today. The sample group partners were additionally asked to describe the role of the VBBW and EnBW in their founding process. Moreover, they were asked to describe the current role and forms of support from the VBBW. Lastly, all participants were asked if they think that they could have also conducted the founding process and realized the first project without any external support. The other questions depended on how well or poorly they scored on specific indicators and the participants were asked to explain the background of their answers. Additionally, they were asked about their contacts to other members and members of other REPCs regarding the nature of their meetings and their utility for the REPC.

Subsequently, the interviews were transcribed and analyzed, with a coding scheme based on the dependent and independent variables of the theoretical framework and answers were searched for key words that matched the indicators. Regarding SO support the answers and key words were coded and assorted to the following indicators of the independent variable SO support: provision of research and informational resources, advocacy support, financial support and networking or alliance-building support. For PO support the answers were coded and assorted to the three independent variables financial support, advocacy support and networking or alliance-building support. Similarly, answers were also coded and assorted to the dependent variables and specific indicators. The coding helped to identify why certain forms of support were useful in the founding process and which forms of support strengthened the human capital, intrinsic motivation and extrinsic motivation of the respective REPCs.

The semi-structured interviews helped to understand why the REPCs found certain tasks in the founding process difficult or easy and why they performed either higher or lower on the dependent variable collective action capacity. Moreover, they enabled to explain why certain forms of support are especially useful for an interest group in the founding process and to strengthen the durable collective action capacity of a REPC. Accordingly, respective forms of support could be directly linked to the dependent variables and more specifically to their sub-variables and indicators.

### *3.4 Operationalization and measurement of the independent and dependent variables*

In the following the operationalization and method of measurement of the independent and dependent variables will be briefly presented, which are intrinsically linked. For a detailed overview on the operationalizations it is referred to the tables in chapter 2 and to

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<sup>90</sup> For an overview on the interview guides see Appendix 7.

<sup>91</sup> In Germany every cooperative is obliged by law to join one of the six general cooperative associations that audits their founding documents as a precondition for their registration. For additional information on the context in which REPCs in Germany operate, see section 4.



Appendices 2, 3, 4 and 7, in which they are translated into the questionnaire and interview questions. The operationalization of variables followed the division in sub-variables and indicators. For all indicators of the sub-variables statements were constructed that are shown in the indicated Appendices.

With regard to the measurement of the independent variables, as the focus of this research lies on SO and PO support and its impact on the founding process and the durable collective action capacity of REPCs, the independent variables for SO and PO support will first be measured in terms of their utility for conducting the different tasks in the founding process and for establishing durable collective action capacity. Here the sample group will be asked additional questions in the questionnaire, to first see whether support was present for the respective tasks and capacity elements and how useful it was to the respective variables. This will be measured on a Likert scale from zero to five, with zero indicating that they did not receive support in the respective tasks and 1-5 indicating how useful the support was for the tasks. In order to find out which specific forms of support had an impact and if so what impact on the founding process, the additionally obtained data from the semi-structured interviews will be used. This data will also be used to see if and how useful ongoing forms of support from the VBBW regarding the respective dependent variables human capital, intrinsic motivation and extrinsic motivation was. The qualitative assessment of the interviews described above enabled these complementary measurements.

With regard to the measurement of the dependent variables of the founding process, the participants are asked to indicate how difficult or easy the fulfillment of the respective tasks in the founding process were for them. The answers will be measured on a Likert scale from 1-5, ranging from 'Very difficult' to 'very easy'. The dependent variables for the durable collective action capacity of the REPCs were similarly measured. For all respective indicators human capital, intrinsic and extrinsic motivation the respondents could answer on a scale from 1-5, ranging from 'I strongly disagree' to 'I strongly agree' about whether they feel the constructed statement (following the previous operationalization) is applicable. Different was the measurement for the sub-variables *connections to others*. This was done by asking the participants to indicate how many and how frequently they meet or have contact to members of other REPCs. Moreover, the indicator *installed PV-capacity* will be measured in kWh and the average installed PV-capacity of the sample and control group REPCs will be compared to one another to see which group installed a higher amount of PV-systems in kWh. *Planned and realized RE-projects* are counted by scanning each REPC's homepage for references to installed projects or concrete plans for installing a new RE-project. Due to the available information it was relatively transparent if the respective REPC realized or planned to realize a large RE-project between 2012 and 2014 through a passive participation model or through cooperation with a project partner. In order to measure the indicators *latest installed RE-project*, *type of latest realized RE project* and *type of latest planned RE-project* the following scoring system was applied. For every REPC that has installed the latest rooftop PV-project in 2012, each group respectively receives one point, two points if the latest project has been realized in 2013 and three points if the latest project has been realized in 2014. Moreover, REPCs that have realized a free standing PV-system as their last project between 2012 and 2014 receive one additional point, while other large RE-projects that have been realized in the same time span receive two additional points, i.e. wind farm participation, RE-based combined power and heating plants and/or local heating grids hydro power etc., since they are more demanding in terms of project realization. REPCs that have been in planning of said large RE-systems between 2012 and 2014 can earn additional points on the same basis. Lastly, the sample group and the control group can gain another point for each large RE-project that has not been realized or respectively is not planned to be realized through an indirect citizen participation model. Accordingly, the sample group and the control group can be compared on the basis of their

scores, with a higher score indicating a higher management capacity. REPCs that have been founded in 2012 will not be considered in the scoring, as all of those REPCs have realized their last project the latest in 2012 and the results would be distorted. Table 6 provides an overview of the high possible scores in the scoring system. Lastly, the sub-variable of durable collective action capacity *non-monetary incentive system* was measured by asking the participants first if they already had a non-monetary incentive system and if not if they planned to install one.

*Table 6: Overview of the highest possible scores in the scoring system*

| Variable  | Highest score possible |
|---|------------------------|
| Perceived difficulty to conduct the founding process                    | 80 Points              |
| Level of available human capital (excluding level of connections)       | 35 Points              |
| Level of intrinsic motivation   | 25 Points              |
| Level of extrinsic motivation (excluding non-monetary incentive system) | 10 Points              |
| Utility of SO and PO support in the founding process                    | 70 Points              |

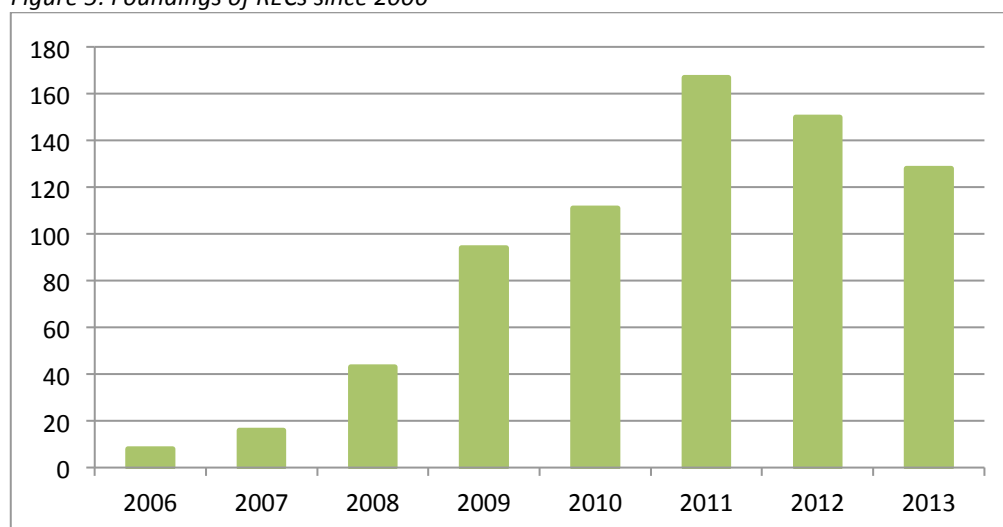
## 4. Background information on the German REPC context

Before it is moved to the case studies, their specific context will be introduced. This includes a brief overview on the development of RECs and specifically REPCs in Germany in relation to the socio-economic context, in which the sample and control group have been founded. In this regard, the unique characteristics of the German legal context, i.e. cooperative law RE-support, and the role of regional cooperative audit associations (CAA) in Germany will also be described. As the support concept of the VBBW and the EnBW Regional AG – which are the SO and PO, respectively, from the sample group cases – is closely leaning on the Weser-Ems REPC founding concept, which has been developed by one of the regional CAAs, it will also be briefly introduced in an independent section. Subsequently, an overview on the current REC associations as forms of SOs will be given, followed by a brief introduction of the most active market POs in Germany. Lastly, the SOs VBBW and the PO EnBW Regional AG and their support concept will be introduced, as they represent the intermediary organizations from the cases. This will altogether draw a comprehensive picture of REPCs in Germany, the RE support structure and its historical development in Germany, the main SOs and POs as well as their support functions.

### *4.1 Development of REPCs and renewable energy support policy in Germany*

In order to put the research into a wider context it is useful to give a brief overview on the development of REPCs in Germany. Currently there are around 888 RECs in Germany (Kayser 2014). Around 145 of these have been founded in Baden-Württemberg, while 237 REPCs have been founded in Bavaria, making them the two federal states with the most RECs in Germany. The majority of RECs in Germany are REPCs that produce energy on the basis of solar, wind and biomass and have been founded after 2005 in communities with less than 50.000 inhabitants (Holstenkamp & Müller 2013; Kayser 2014; Maron & Maron 2012). Thus far REPC have invested about € 1.5 billion in RE-systems in Germany (DGRV 2014). The largest business field for REPCs is producing PV-electricity and a smaller but growing number is producing and distributing heat in local district heating grids and is starting to invest in wind energy as well (DGRV 2013a; Holstenkamp & Müller 2013; Kayser 2014). As shown in figure 5, the year 2009 marked a founding boom that peaked in 2011 and is on the decline since 2012.

Figure 5: Foundings of RECs since 2006



Sources: (DGRV 2013a, DGRV 2014)

This decline can be mainly explained by the coming into effect of the EEG 2012 on 1<sup>st</sup> April 2012. It introduced a new FiT-system with a more frequent degeneration in FiTs for PV per year. The more frequent degeneration has made it harder for REPCs to realize projects, as it increases the pressure to quickly plan and realize a new project before the next degeneration would come into effect. Accordingly the introduction of the EEG 2012 brought a lot of insecurities into the investment climate for small to medium PV-projects (Elpers 2013; EEG 2012, Volz 2012).

It is also useful to take a closer look into the ongoing debates in German politics and media about a general reform of the EEG that started in early 2012 and became more concrete throughout 2013. The public debate started after it was becoming clear that the EEG-levy, a levy that is paid by the local grid-operator and increasingly passed on to the electricity consumers, would significantly rise in 2013. While the levy was 3,53 Ct/per consumed kWh in 2011, it rose to 3,59 Ct/kWh in 2012, to 5,27 Ct/kWh in 2013 and to 6.27 Ct/kWh in 2014 (BEE 2013). The increase is mainly due to two factors. First of all, the exemptions from the EEG-levy that have been granted to large electricity consumers were significantly extended with an amendment of the EEG that came into effect 2012<sup>92</sup>. While 743 companies were exempted in 2012, the number rose to 2.098 in 2014, contributing 1,26 ct/kWh to the levy (BEE 2013). Secondly, it is related to the significant drop in electricity spot market prices, as the annual levy is based on the difference between the respective feed-in tariffs (FiTs) for installed RE-technologies and the average annual spot market price for electricity. While the average spot market price for electricity was around 7ct/kWh in the 3<sup>rd</sup> Quarter of 2008, it dropped to 3,7ct/kWh in 2013, and contributes additional 1,47ct/kWh to the 2014 EEG-levy<sup>93</sup>. The drop is due to a combination of the prices for carbon certificates, a sudden price drop in coal between 2012 and 2014<sup>94</sup> and the merit order effect of RE on the spot market, due to a growing amount of RE feeding into the electricity grid that have no marginal costs, making renewables a victim of their own success (BEE 2013; Sensfuß et al. 2007; Wirth 2014). In comparison, the total amount of RE-installments based on FiTs contributed about 2,54ct/kWh to the levy in 2014 with declining annual growth rates due to lowered FiTs and significant cost reductions especially for PV-systems (BEE 2013).

Nevertheless, the public debate about the EEG reform mainly revolved around reducing costs of further installments based on FiTs and to slow down the development of increasing RE-system installments (Netzkauf EWS eG 2012). Therefore, two measures have been repeatedly proposed by the government since 2012 to lower the overall EEG-levy. These measures are currently also included in the drafts for the EEG 2014 that has been proposed by the newly elected government (BMW 2014). The first measure that is sought to come into effect in 2017 is to make it compulsory for RE-system owners with systems above 100 kWh to directly market the generated electricity to the spot market to avoid further FiT provision for systems >100kWh. This measure would significantly increase the bureaucratic workload for REPC management boards, which can pose a serious hurdle for realizing medium to large RE-projects for REPCs in Germany (DGRV 2014) as 94% of REPCs are managed on a voluntary basis (Volz 2012). It is important to differentiate between this type of direct marketing and the type of direct marketing mentioned in the theoretical part, as the first involves the use of a transport grid and is not sold directly to a consumer close to the source.

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<sup>92</sup> While only companies with an electricity consumption >10MW were exempted until 2012, the exemptions were expanded to companies with an electricity consumption >1MW.

<sup>93</sup> For further details see (BEE 2013), as a detailed discussion on this topic is out of the scope of this research.

<sup>94</sup> The price dropped from €119.5/t in 2012 to €88.4/t in 2014 (StaBa 2014).

In relation to that, the second proposal is to charge owners of PV-systems with the EEG-levy on the electricity that they consume for themselves. This would practically make it impossible for REPCs to directly market their PV-electricity from small to medium-scale systems to consumers in proximity to the PV-system in PV-renting models, as it would add additional costs of 6.24 ct/per consumed kWh (DGRV 2014; BEE 2013). Without further significant and short-term price decreases of investment costs for PV-systems, this business model would simply not be economically feasible in the next coming years, as it would not be economically attractive for the consumers to 'rent' their electricity from the REPC's PV-system on their roofs<sup>95</sup>. Moreover, the planned mandatory marketing to the spot market from 2017 on would make it practically illegal to use this business model (BWGV 2014). Against the background that 52% of REPCs in Germany plan to direct their activity into this field and around 10% already use such a marketing model (DGRV 2013a), these measures pose a serious threat for their future investments. If the discussed measures come into effect, the scope of business opportunities for REPCs would therefore be significantly narrowed down<sup>96</sup>.

Accordingly, the EEG 2012 and the policy debate has impacted the founding boom of REPCs in Germany as it introduced a lot of insecurities to the investment climate. In 2014 alone, around €300 million worth of investments of existing REPCs have been put on hold indefinitely (DGRV 2014). However, this development has not affected REPCs that plan to install a local district heating grid based on RE, as the number of these types of REPCs has been steadily growing since 2006 and make up about 147 of the 888 RECs in Germany, with an increase of 27 in 2013 (DGRV 2014). Additionally, a growing interest of existing REPCs in regional wind energy production can be observed (DGRV 2013a). These circumstances have to be kept in mind when interpreting the results of the questionnaire, especially indicators regarding the perceived management capacity of the sample group and the control group.

#### *4.2 On the role of regional cooperative audit associations (CAAs) in Germany*

To be able to assess the impact of PO and SO support on the founding process and the collective action capacity of a REPC in Germany, it is important to first introduce the specific characteristics of the legal framework in which a REPC operates. In Germany, every cooperative is required by law to first join a business-specific or a regional cooperative audit association (CAA), in order to officially register its business (GenG 2006, §53). While for example cooperative banks<sup>97</sup>, consumer cooperatives<sup>98</sup> and housing cooperatives<sup>99</sup> have their own specific CAAs, all REPCs as defined in this research are members of one of the following five regional CAAs<sup>100</sup>, namely Genossenschaftsverband Weser-Ems (GVWE), Baden-Württembergischen Genossenschaftsverband (BWGV), Rheinisch-Westfälische Genossenschaftsverband (RWGV), Genossenschaftsverband Bayern (GVB) and Genossenschaftsverband e. V. (GenV), that are united under the national roof organization Deutscher Genossenschafts und Raiffeisen Verband (DGRV). Independent from their entirely

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<sup>95</sup> For further information of such a business model see (DGS Franken 2013; Naturstrom 2014a Rutschmann 2013).

<sup>96</sup> Nevertheless, it also has to be mentioned that 42% of the asked REPCs saw their own know-how and another 47% legal hurdles as the biggest challenges to implement a local or regional direct marketing model (DGRV 2013a).

<sup>97</sup> Bundesverband der Volks- und Raiffeisenbanken e. V. (BVR).

<sup>98</sup> Zentralverband deutscher Konsumgenossenschaften e. V. (ZdK)

<sup>99</sup> Bundesverband deutscher Wohnungs- und Immobilienunternehmen e. V. (GdW).

<sup>100</sup> For further details on the types of cooperative audit associations in Germany see (Holstenkamp 2012; DGRV 2013b).

voluntary involvement with a REC association, all cases from the sample group and the control group are therefore members of either the GVB or the BWGV. In reference to the theory, all CAAs in Germany are general cooperative associations with the primary purpose to audit their cooperative's founding documents<sup>101</sup> and to conduct mandatory yearly or bi-yearly audits<sup>102</sup> of the cooperative depending on their size (GenG 2006, §11; §53). Additionally, they ought to foster the general development of the cooperative idea ('Genossenschaftswesen'), they also give advice on the code of conduct, financial planning and the organizational development of a cooperative when requested by interest groups or member REPCs (Gottwald 2013; Janik 2013; DGRV 2013b). Different from other corporate entities in Germany, where a yearly audit only becomes mandatory when they grow beyond a certain threshold (HGB 2013, §§ 316; §267), cooperatives and specifically REPCs are always obliged to let their CAA conduct an audit once or twice every two years. The legal construct of mandatory membership with annual or bi-annual audits for cooperatives is unique in the EU, and its aim is to protect the members of the cooperative from financial losses, or in the worst case from additional subsequent capital contributions, if their cooperative goes bankrupt (Bergmann 2001).

On request, all five regional CAAs in Germany provide interest groups with basic research and information resources as well as advocacy support free of charge, including two in-person consultancy meetings<sup>103</sup>, where the interest group can ask specific questions and get advice on their code of conduct and their financial planning and staff to host the founding event (BWGV 2013; GenV 2013; Gottwald 2013; GVB 2013; GVWE 2013; Janik 2013; RWGV 2013). All CAAs either provide publicly accessible information and start-up manuals for cooperatives, some also specifically for REPCs (RWGV 2009), on their websites or send them out for free on specific request (BWGV 2013; RWGV 2013; Gottwald 2013; GenV 2013). This includes a CD-ROM<sup>104</sup> offered for free by every CAA through the DGRV, comprising a general do-it yourself package with sample code of conducts, sample business plans, sample cost-effectiveness calculations and all the necessary legal documents for the founding process of a cooperative (DGRV 2009). Although the provided information refers to cooperatives in general it can also be transferred to REPCs in large parts (Janik 2013). Advocacy support includes the provision of staff to host and the founding event and assist with the founding protocol on request. In the analysis of the obtained data from the online research, the questionnaire and semi-structured interviews it is important to keep in mind what potential role CAAs in Germany can play specifically in the founding process. It has to be assumed that every REPC in minimum was provided with an audit of their founding documents, as the approval of a CAA is mandatory for registering the REPC.

Nevertheless, one founding concept is worth taking a closer look since it has played a significant part in the founding boom of REPCs in Germany in the recent years (Flieger 2009; Janik 2013) and was the prototype for the VBBW and EnBW founding concept. The founding concept was coined the Weser-Ems-model (Flieger 2009) as it was developed by the GVWE between mid-2007 and 2008<sup>105</sup>. In comparison to the other regional CAAs<sup>106</sup>,

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<sup>101</sup> The audit of the founding documents costs a cooperative a one time fee between €100 - €5000, depending on the respective regional CAA and the complexity of the business model (Deutscher Bundestag 2013).

<sup>102</sup> The annual or bi-annual audit costs a cooperative €100 - €500 depending on the respective regional CAA and the complexity of the business model (Deutscher Bundestag 2013).

<sup>103</sup> If the interest group needs additional meetings they usually get charged, depending on the specific regional CAA.

<sup>104</sup> See for example (DGRV 2009).

<sup>105</sup> The concept was developed in reaction to the reform to of cooperative law in 2006, that made it easier to form and manage smaller cooperatives and to the release of the IPPC report (IPPC 2007) and subsequent discussions on climate change in the G-8 summit in Heiligendamm (Germany) (Janik 2007).

GVWE has a more direct approach and can be interpreted as the most proactive CAA regarding the establishment and the further development of REPCs in Germany. In comparison to the other five regions where the rest of the regional CAAs operate, the Weser-Ems region is relatively small<sup>107</sup>. Nevertheless, it counts 58 energy cooperatives that are members of the GVWE of which the majority are PV-electricity producing institutional-organizational REPCs that have been established in partnership with local cooperative banks after 2007, including some that also produce electricity from wind energy (Janik 2013). Additionally, REPCs and other types of innovative RECs<sup>108</sup> receive active networking support from the GVWE in terms of providing possibilities for exchanging information and for networking events that have been organized by the GVWE, where presentations and discussions on new developments and cooperation opportunities are held (GVWE 2013; Janik 2013).

Since the GVWE is a relatively small regional CAA, they know many VR- banks, and municipal representatives on a personal level and have frequent contact with them, which made it easy to proactively introduce the idea to municipal councils through GVBW members or interested VR- banks in the beginning (Herbers et al. 2010; Janik 2013). Usually the GVBW used its contacts to the VR- banks and in turn the VR- banks suggested it to the respective municipal representatives. After this, staff members of the GVWE were invited to present the concept to the respective municipal councils. In mid-2007, the first REPC based on this concept was established, the Sonnenstadt Jever eG, and an information package in form of a CD-ROM, was developed on the basis of the REPC's experience (Janik 2013). Since 2008 this information package is offered by the GVWE to local VRB banks for € 2.000, and comprises detailed and commented founding documents, including all the necessary legal documents for the founding event, a step-by-step manual on how to take important steps in the founding process, sample business plans and code of conducts, cost-effectiveness calculation PC-programs for PV-modules, power point presentations for the founding event and samples for flyers and posters to advertise the event (Janik 2013; Flieger 2013a).

The basic idea of the concept is to make use of municipal rooftops for local REPC-owned PV-systems<sup>109</sup> and to commission the installment to local craftsmen to increase the local added value of regional RE-projects (GVWE 2013; Janik 2013; Maron & Maron 2012). The other parts of the concept includes networking and alliance-building support for setting-up partnerships between VR-banks, municipal actors and local citizens, to establish a REPC and its first project (Janik 2013; Maron & Maron 2012). Here the local VR-bank acts as the initiators and main driver of the REPCs and their development by providing advocacy support in terms of staff provision to inform citizens about the plan to establish a REPC, to manage and organize the founding process and the project(s), to distribute and market the REPC shares, and to take over the management of the established REPC. Moreover, the respective partner VR-bank also provides the external capital for the REPC's projects (Herbers et al. 2010; Maron & Maron 2012). In those partnerships municipalities or municipal representatives often become members and provide the rooftops either free of charge or for a low lease, increasing the overall profit for the REPC (Maron & Maron 2012).

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<sup>106</sup> Although other regional CAAs like the RWGW have also become more proactive in presenting founding concepts for REPCs to municipalities in recent years (Gottwald 2013).

<sup>107</sup> It comprises around 14.965,38 km<sup>2</sup> and is located in Western Lower-Saxony, next to the Dutch border.

<sup>108</sup> See for example Ingenieur Netzwerk Energie eG (iNeG 2014) or Oldenburger Energiegenossenschaft eG (Olegeno 2013).

<sup>109</sup> The original idea to use municipal rooftops came from a RE-project development company, but was rejected since no municipal representatives knew them personally and did not trust them. The basic idea was caught up by the GVBW and developed further (Janik 2013).

### *4.3 Support organizations (SOs) in form of renewable energy cooperative associations in Germany*

Next to the compulsory membership in the CAAs, REPCs can also become members in other REC associations that have been founded in Germany in recent years, where the membership is voluntary. These REC associations relate to what has above been defined SOs. In the following, the several REC associations in Germany will be briefly presented, in order to provide a detailed picture of the SO landscape in Germany and the provided support functions. Currently, REC associations in Germany include the VBBW, Landesnetzwerk BürgerEnergieGenossenschaften Rheinland-Pfalz e.V. (LanEG Rheinland-Pfalz), Landesnetzwerk Bürger-Energiegenossenschaften Hessen e.V. (LanEG Hessen) and BürgerEnergie Thüringen e.V.. In the following, these REC associations will be briefly introduced, excluding the VBBW that will be presented separately in the following sections, as the focus of this research lies on the VBBW and EnBW Regional AG support concept.

LanEG Rheinland-Pfalz was founded in 2012 by 17 REPCs and LanEG Hessen was founded in late 2013 by 11 REPCs (LanEG 2013; Energiewende Jetzt 2013c). Both follow the same approach and aim to respectively provide research and information resources, networking and alliance-building support and advocacy support for their member REPCs and interest groups in the federal states of Rhineland-Palatinate or Hessen. The purpose of these organizations is to bundle and represent their members' interests in their federal state. They enable the exchange between members by organizing annual meetings and expert conferences on RE topics, policy development and its related barriers and opportunities specifically for REPC business models. Moreover, they also help to connect their members to other RECs, REPCs and market actors, e.g. green energy providers outside of their respective federal state, by establishing and maintaining contact through personal networks of the LanEG Rheinland-Pfalz and LanEG Hessen management boards to initiate collaborative partnerships between REPCs and/or other market actors to jointly realize and operate larger RE-projects. They also support the founding process of REPCs in their federal states through the provision of step-by-step founding manuals<sup>110</sup> and consultancy meetings with staff. In cooperation with Energiewende Jetzt<sup>111</sup> they also offer apprenticeships and seminars specifically for interested individuals who want to start a REPC and management and advisory board members of REPCs (LanEG 2013; Energiewende Jetzt 2013c). The centerpiece of this form of support is a four-month apprenticeship, started by Energiewende Jetzt in 2010, to become a certified project manager for REPCs based on PV-electricity production. After a successfully completed apprenticeship the project managers have access to an internal online platform, where they can exchange information with other REPC project managers on legal and technical issues that they are dealing with in their respective REPCs (Energiewende Jetzt 2013b). Moreover, another apprenticeship for REPC wind energy projects is in planning for mid-2014 (Energiewende Jetzt 2014). To support REPCs that want to jointly realize larger regional RE-projects the RegionalEntwicklungs-Genossenschaft Regenerative Energien Rheinlandpfalz eG (REGE eG) was founded in collaboration with LaneG Rheinland-Pfalz REPCs in 2012, as a cooperative RE-project development partner for wind farms. It aims to secure suitable regional sites for its member REPCs to jointly establish direct citizen participation models with or without project POs in order to compete with national and international project POs for securing the sites and majority shares of large regional RE-projects (REGE 2012). As majority shareholders of the RE-project, the REPCs, represented by members in the management and advisory board of REGE eG, are free to

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<sup>110</sup> See for example (Flieger & Lange 2012).

<sup>111</sup> Energiewende Jetzt is a network organization for RECs and specifically REPCs, that offers apprenticeships and seminars and the largest data base on RECs online for public access in Germany. For further information see (Energiewende Jetzt 2013b; 2014).



decide who else can invest in the RE-project. Because creating regional added value plays an important role in the REGE eG concept, participating REPC members in physical proximity to the project are prioritized to invest through subordinate loans as well as regional strategic partners (REGE 2012).

BürgerEnergie Thüringen e.V. is the roof organization of nine REPCs in the federal state of Thuringia and was founded in mid-2013 by eight local REPCs. Compared to the LanEG cooperative associations, BürgerEnergie Thüringen e.V. has a main focus on advocacy support in terms of political representation of their members on a federal level towards public authorities, other interest groups, banks and regional energy market actors. Their aim is to participate in municipal and regional energy politics to be able to influence and contribute to energy policy-making accordingly. Moreover, they aim to represent their members' interests towards public authorities, other interest groups, banks and regional energy market actors (BET 2014). This is also reflected in their goal to jointly invest in the grid company E.ON Thüringer Energie AG, a subsidiary of the utility E.ON AG that was municipalized after E.ON AG sold their shares in February 2013 to a conglomerate of public utilities that renamed the company into Thüringer Energie AG (2014; NA Presseportal 2013). Moreover, they inform their members via frequent newsletters on current RE policy and market development, offer PR support for local RE-projects and organize annual networking events between their members and other public and market actors<sup>112</sup> (BET 2014). The latest project of BürgerEnergie Thüringen e.V. is the establishment of the brand Thüringer Landstrom, with the goal to directly market locally and regionally generated renewable electricity in collaboration with regional utility companies to consumers in Thuringia. Under the Thüringer Landstrom label, utilities can directly market the regionally produced electricity through respective electricity tariffs to the end-consumers (BET 2014).

#### *4.4 Relevant partner organizations (POs) in Germany*

In the following a brief overview on POs in Germany will be presented. Despite the focus of this research on the EnBW AG as PO, this is necessary because the complex German REC structure does not allow for a clear separation when assessing the support provided to REPCs. Thus, this complex picture needs to be taken into account in the analysis. It has to be noted that only the most relevant market actor POs will be presented in this section, thus excluding governmental actor POs. The role of local government agencies and municipalities will be further elaborated on in the analysis of the respective cases. The most active market actor POs in Germany that have been involved in the founding process of REPCs are VR-banks, EnBW AG<sup>113</sup>, Netzkauf EWS eG, and Agrokraft GmbH. VR-banks are by far the most active POs that initiated and/or operate REPCs through staff members. This is mainly due to the aforementioned Weser-Ems Model of the GVWE that was developed for VR-banks, in which they play a central role in the setting up of a REPC. EnBW AG is the second most active PO in terms of initiating REPCs, with a concept that closely leans on the Weser-Ems model and has been adjusted for the needs of EnBW AG (Maron & Maron 2012). The EnBW AGs concept that is executed in close cooperation with the VBBW will be presented in section 4.5, as it is the main focus of this research.

Next to EnBW and the VR-banks, but to a lesser extend in terms of realized REPCs, also Netzkauf EWS eG and Agrokraft GmbH actively support the founding process and the

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<sup>112</sup> See for example Thüringer Energie- und Green Tech-Agentur (Thega 2014), BIOEnergie Beratung Thüringen (Biobeth 2014), Nachhaltigkeitszentrum Thüringen (NHZ-TH 2014) and Naturstrom AG (Naturstrom 2014b).

<sup>113</sup> Next to EnBW AG also the second largest energy utility RWE AG, initiated a REPC in 2013, through which citizens in North-Rhine Westphalia and Rheinland-Palatinate can invest in large PV-systems and wind farms owned and operated by RWE AG (Die Bürgerenergie eG 2013).

further development of REPCs. Netzkauf EWS eG is a cooperative and national energy provider based on 100% RE, with close ties to the anti-nuclear power movement<sup>114</sup> (Netzkauf EWS eG 2012; Maron & Maron 2012). They provide in-person consultancy support to local interest groups in Baden-Württemberg that are founding or planning to found a RECs or REPCs. For the further development of REPCs in terms of jointly realizing larger RE projects, Netzkauf EWS eG supplies REPCs with the venture capital as a development partner in the project, which is especially useful to realize wind turbines, since they require advance payments for services that have to be undertaken before the wind turbine can even be planned, e.g. wind measuring or environmental impact assessments (Netzkauf EWS eG 2012).

Agrokraft GmbH is a service and consultancy company that is active in Bavaria and has been founded in 2006. It offers full consultancy service for private individuals, interest groups and existing REPCs that want to invest in small or large RE-projects in the fields of PV, wind turbines, combined heat and power plants based on RE, bio-gas plants and local district heating grids. On the basis of their first projects<sup>115</sup>, Agrokraft GmbH developed a standardized founding concept for REPCs together with the GVB, which they offer for € 5.000 and which has been used by 21 REPCs in Bavaria (Flieger 2013a; Agrokraft 2014). The founding concept includes in-person consultancy for specific problems and questions, sample code of conducts and project-specific business plans depending on the desired technology, calculation and administration tools for RE-specific projects and member management, creating a corporate identity for REPCs in rural areas under the label Friedrich-Wilhelm Raiffeisen<sup>116</sup> (FWR), the provision of a website for each REPC with a standardized design and structure and financing projects through profit participation loans (Flieger 2013a; Agrokraft 2014). Next to the founding process, Agrokraft GmbH also offers further services such as monitoring and optimizing running systems, e.g. local heating grids in combination with a RE based heating facility, and the management of RE-systems for REPCs. Services of Agrokraft GmbH have so far mainly been used in larger RE-projects<sup>117</sup>. Moreover, they offer market research, feasibility studies and consultancy on setting up project companies for REPCs that want to jointly invest in capital intensive RE-systems, including sample contracts with relevant stakeholders, tax consultancy, support in gathering internal capital from existing and new REPC members and supervision in the details of the construction of RE-systems (Agrokraft 2014).

There are also examples of public utilities<sup>118</sup> that have initiated or were actively involved in the founding process of a REPC, but not all public utilities in Germany are willing to collaborate with a local REPC as some perceive them as competition. If a REPC is in an equal partnership with a local government agency or a public utility, the REPC members have an opportunity to directly influence the regions energy policy and development. Therefore, some government agencies and especially public utilities are reluctant to share responsibilities with RECs, because they are afraid to give up competencies on future developments of the energy infrastructure in their area of influence (Flieger 2011d: 2012). Moreover, some public utility representatives argue regarding citizen participation models

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<sup>114</sup> For further information see Netzkauf EWS eG (2012).

<sup>115</sup> See for example FWR Energie eG (FWR Energie eG 2014) and FWR Energie Großbardorf eG (FWR Großbardorf 2014).

<sup>116</sup> Friedrich-Wilhelm Raiffeisen is one of the founding fathers of the cooperative movement in Germany and helped to establish self-supply cooperatives in structurally weak rural areas in the mid to late 1880s.

<sup>117</sup> This is generally restricted to bio-gas plants, local heating districts and connected renewable heating-systems and wind turbines.

<sup>118</sup> See for example BürgerEnergieGenossenschaft Wolfhagen (BEG Wolfhagen 2013) Energiegenossenschaft Lehrte eG (EG Lehrte 2013).

that public utilities already stand for a model of inclusive citizen participation, as they are in public hands and represent the interest of the local citizens (Holstenkamp 2013).

#### 4.5. The VBBW and EnBW Regional AG

In the following sections the EnBW AG will be briefly introduced, as the founding of the VBBW and the support of REPCs through the EnBW Regional AG is closely connected to the company's sustainability strategy. Subsequently, the founding and support concept of the VBBW and the EnBW Regional AG will be presented to give an overview on the specific forms of support they provide.

##### 4.5.1 REPCs as part of the sustainability strategy of the EnBW AG

Energie Baden-Württemberg AG (EnBW AG) is a utility company that originated in 1997 through the fusion of the two publicly owned energy providers Badenwerk AG and Energie-Versorgung Schwaben AG (EVS). In the year 2000, the federal state sold shares of 25.1% for € 2.4 billion to the French public utility *Électricité de France* (EdF) and the fusion with the public utility *Neckarwerke Stuttgart AG* in 2003 made EnBW AG the third largest energy provider in Germany after RWE and E-on, in terms of customers and sales. EdF increased its shares up to 45,01% until December 2010 when the federal state of Baden-Württemberg decided to buy back its shares through a 100% publicly owned company, i.e. the *NECKARPRI GmbH*, for € 4,67 billion at € 41,50 per share. Today, EnBW is almost up to 100% in the hands of publicly owned utility companies<sup>119</sup> (Leprich 2011). For an overview see Table 7.

Table 7: Shareholders of the EnBW AG

| Shareholders  | Shares in Stock |
|---|-----------------|
| OEW Energie-Beteiligungsgesellschaft GmbH (OEW GmbH)    | 45.01%          |
| NECKARPRI GmbH  | 45.01%          |
| EnBW Energie Baden-Württemberg AG                       | 2.30%           |
| Badische Energieaktionärs-Vereinigung (BEV)             | 2,54%           |
| Gemeindeelektrizitätsverband Schwarzwald-Donau (G.S.D.) | 1.28%           |
| Landeselektrizitätsverband Württemberg (LEVW)           | 0.54%           |
| Neckar-Elektrizitätsverband                             | 0.69%           |
| Other municipal shareholders                            | 0.78%           |
| Shares owned by diverse shareholders                    | 1.85%           |
| <b>Sum</b>  | <b>100%</b>     |

Source: (Leprich 2011)

Although EnBW was able to increase its annual returns from €10,7 billion in 2005 (Leprich 2011) to €19,2 billion in 2012 (EnBW 2012), the company faces major challenges regarding the future of its energy portfolio. Electricity production and distribution based on nuclear energy poses still the main business field of the company: 80% of the returns can be traced back to the business field electricity and it contributed around 84% of the profits in 2010. More than half of those profits are based on producing and distributing electricity from their four nuclear power plants, while the second largest contributions stem from their coal fired power plants (Leprich 2011).

As the German government decided to phase out nuclear energy by 2022 and renewable energy based electricity production is slowly starting to dominate the electricity system, EnBW AG is in need to adapt its strategy and increase their efforts in the field of RE.

<sup>119</sup> Shareholders range from small communities to larger municipal districts. For further details see (Leprich 2011).

So far investments in RE were very marginal<sup>120</sup> and RE only makes up around 12.2% in their electricity portfolio (EnBW 2012), due to the company's main focus on fossil and nuclear energy production. Their renewable production is mainly based on old hydro-power systems that have mainly been erected in the 1950s (Lepprich 2011). In comparison to E.ON, RWE and Vattenfall, EnBW has the lowest installed capacity in new RE systems such as wind, solar, biomass and geothermal, making up only 0.1% of its generation system<sup>121</sup>. According to EnBW's sustainability reports, the company wants to invest €8-10 billion in renewables internationally and build up around 3.000 MW of RE capacity in Germany alone (EnBW 2012). The main focus lies here on large-scale RE systems, i.e. off- and onshore wind parks and run-of-the-river hydroelectric power stations. Additionally, EnBW wants to focus on gas plants and pumped storage hydro power stations to increase the flexibility of their generation system (EnBW 2010).

In the context of their sustainability strategy EnBW AG also supports the founding process and first projects of REPCs in Baden-Württemberg since 2008 through EnBW Regional AG, a subsidiary that operates electricity grids and distributes energy. The founding of the first REPC BürgerEnergiegenossenschaft Aichstetten with the support of staff from EnBW Regional AG and the municipality laid the cornerstone for their concept to found and foster local REPCs in Baden-Württemberg (EnBW 2008a). Till October 2009 16 institutional-organizational REPCs have been founded and in November 2009 the REC association Verband der BürgerEnergiegenossenschaften Baden-Württemberg (VBBW) was established with 16 member REPCs that have received support from the EnBW Regional AG. In the following the founding concept of the VBBW and the EnBW Regional AG will be further elaborated on.

#### **4.5.2 The support concept of the VBBW and EnBW Regional AG**

In the following, the concrete forms of support provided by the VBBW, representing a SO, and EnBW Regional AG, representing a PO, will be presented, beginning with the support in the founding process by presenting their founding concept and followed by the ongoing support provided to VBBW members by both organizations.

Since 2009, VBBW and EnBW Regional AG support the founding process of REPCs in close cooperation through the provision of research and information resources, advocacy support and financial support. Currently the VBBW has almost 60 member REPCs in Baden-Württemberg. The VBBW was established to support interest groups and to connect member REPCs in annual and extracurricular meetings on demand, enabling them to exchange information and experience with their respective REPC and its projects to learn from one another. Moreover, the VBBW informs them about important policy developments that pose challenges or opportunities for their REPCs and establishes contacts to important economic and political actors to represent its members' interests (Strobel 2013; VBBW 2010).

The founding process is either actively initiated by the VBBW and EnBW Regional AG through staff members that contact municipal representatives or by local interest groups that ask the VBBW or EnBW Regional AG for assistance. The minimum share of a VBBW REPC costs €100, to enable broad participation from local citizens. Generally most VBBW REPCs allow for individuals and regional corporate bodies to become members of the cooperative. The first VBBW REPCs in 2008 have all been founded through the initiative of the EnBW Regional AG that established contacts to municipal representatives to present the idea and

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<sup>120</sup> In 2012 EnBW, RWE, Eon and Vattenfall's investments contributed to 12,5% of the total installed RE capacity in Germany, while RE capacity installed by citizens amounted to 46,6% (Holstenkamp 2013).

<sup>121</sup> The share refers to the year 2007 (Hirschl 2009).

to actively organize and host the founding process. Later, many other REPCs were initiated through municipal representatives by inviting the VBBW that gets provided with EnBW Regional AG staff when requested (Strobel 2013; KommPlus 2011). Similar to the Weser-Ems Model, close cooperation with the municipality is a key element in the founding concept and in almost every VBBW REPC at least one local mayor holds a position in the advisory board and the first PV-systems are usually installed on municipal roof tops that are offered free of charge. In the case that the VBBW and EnBW Regional AG jointly initiate the REPC for the municipality, staff from both organizations conducts all necessary tasks in the founding process. Moreover, the EnBW Regional AG usually offers to provide the business case and an insurance package, and if requested, the realization for the first FiT-based PV-project<sup>122</sup> (EnBW 2008b; KommPlus 2011). Volunteers for the management and advisory board are recruited in the founding event from local participants.

In case the VBBW has been contacted by a local interest group VBBW staff supports the necessary tasks in the founding process together with EnBW Regional AG staff through advocacy support in terms of providing the interest group with consultancy meetings. The amount of support, however, always depends on the needs of the interest group and therefore on professional experience that might be useful for conducting the necessary tasks in the founding process. If need be, the VBBW can also request EnBW Regional AG staff to assist the interest group in gaining the knowledge to develop and manage small-scale PV-systems through consultancy meetings. However, experience has shown that most of the interest groups that contacted the VBBW had the necessary competency and therefore did not need further consultancy to develop small-scale PV-systems<sup>123</sup> (Strobel 2013). Generally all interest groups get provided by the VBBW with sample code of conducts, sample business plans, standardized work protocols and sample internal rules of procedure for the management and advisory board in their orientation phase, that get adapted to the needs of the local project(s) together with staff from the VBBW in the first consultancy meetings. Additionally, the VBBW can assist in generating external capital by providing comparisons between different banks for project financing (Strobel 2013). In every case the VBBW and the EnBW Regional AG provides all REPCs with PR-support in the planning phase by freely providing informational booklets about the founding event and its first project and distributes them to the local citizens (Strobel 2013). The chairwoman of the VBBW usually hosts the founding event to make sure all requirements are met according to legal protocol and submits the founding documents to the BWGV for the audit (Strobel 2013). Next to providing staff, EnBW Regional AG gives financial support by offering an unconditional one-time budget of €10.000 for an interest group that wants to found a REPC and become a member of the VBBW. Although the REPC has to give account on what the money was spent on, it is relatively free in making use of the budget. Parts of it are usually used to pay for renting a room for the founding event and the fees for the audit of the founding documents<sup>124</sup>. The provision of this budget has the advantage that the interest group is not personally liable for costs occurring in the founding process in case the REPC is not founded, thus taking this risk off of active founding members. Additionally, they are free to use it for

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<sup>122</sup> In the past this was realized through the EnBW Solar Bürger Aktiv program where the municipality concludes a user contract for a municipal roof with a full liability subsidiary (GbR), in which the REPC and other local businesses can invest, that develops and installs a PV-system on a municipal rooftop with the support from EnBW Regional AG. An example of this legal construct can be found in Balingen, Baden-Württemberg (Irion 2013; EnBW Regional AG 2013).

<sup>123</sup> Some VBBW REPCs even have been founded with staff of EnBW AG that hold positions in the management boards that were engaged as private persons in their home towns to support the REPC with their expertise (Strobel 2013).

<sup>124</sup> This amounts to a one-time fee of €1,500.

whatever they need to establish a REPC and for covering costs after the founding event<sup>125</sup>.

Next to supporting the founding process, the VBBW and the EnBW Regional AG also provide research and information resources, advocacy support and networking and alliance-building support for member REPCs in their further development. For every new member the VBBW offers one-day-seminars on the roles and related tasks of the management and

Figure 6: Example for a unified Logo on a REPC website



advisory board that are held in the regional facilities of EnBW Regional AG. These seminars are coupled with schooling for a member and administration software that was developed by EnBW Regional AG to minimize the invested time of REPC management boards in the preparation of the annual financial statements and taxing matters as well as the annual dividend for the REPC members (Strobel 2013; KommPlus 2011).

Additionally, the VBBW helps to create a corporate identity for its members as all the REPCs carry the name “BürgerEnergiegenossenschaft<sup>126</sup> (respective municipality or region)” and get unified online appearances on their respective websites provided by the VBBW. As shown in figure 6, the label BürgerEnergie resembles a typical German town sign design that implies the local and municipal connection of the REPC. All individual websites are structured in the same way and provide information on the current size of the cooperative, its goals, member shares, realized and planned projects, and upcoming events. Depending on the effort invested by active members, some VBBW REPCs provide additional information on their founding process press releases and so forth. All VBBW REPC websites make it possible for interested individuals to sign up online to become a member. Further advocacy support by the VBBW is offered through phone consultations on demand for specific questions and problems free of charge for member REPCs. Additionally, the VBBW offers their members an online platform to exchange ideas and problem solutions, yet this is not frequently used by the members, as the main information provision on REPC related topics, upcoming events and opportunities to participate in large RE-projects is centralized in the VBBW through frequent newsletters and network meetings (Strobel 2013).

The network meetings comprise the annual assembly of all VBBW members that want to participate and regional network meetings in facilities of the EnBW Regional AG in Baden-Württemberg<sup>127</sup>. They are sought to enable direct exchange between REPCs and to inform REPCs on specific RE and energy efficiency related topics. Here EnBW Regional AG also often provides experts for presentations on specific energy topics or tax matters regarding RE-investments (Strobel 2013). The character of these gatherings are, however, rather informational as opposed to specific and certified apprenticeships, workshops and seminars on cooperative organization and process management offered by the BWGV for a respective fee, depending on the extent and length of learning opportunity (Strobel 2013; BWGV Akademie 2013). Due to the time constraints of active members, it seems as if alliance-building and networking between VBBW REPCs often only occurs between REPCs in the same regions or between or proximate municipalities (Strobel 2013).

In order to enable member REPCs that lack the respective competence and personal capacities to participate in larger RE-projects<sup>128</sup> without having to take management responsibilities and financial risks, the BürgerEnergie AG was founded in May 2012 as a strategic partner for REPCs by the head of the VBBW management board (Strobel 2013). The

<sup>125</sup> For example the first biannual audit by the BWGV that costs around €750 for small cooperatives with total assets below €2 million in the first three years after their establishment. After three years the fee amounts to €1.500 for the annual or biannual audit (BWGV 2012).

<sup>126</sup> Translation: Citizen energy cooperative.

<sup>127</sup> For an overview on the regional facilities see (EnBW Regional AG 2013).

<sup>128</sup> Including wind turbines, PV-parks and run-of-the-river hydroelectric power stations above 1MW.

BürgerEnergie AG functions as a holding that creates and manages limited liability companies as an investment vehicle (GmbH & Co. KGs) to buy shares of large regional RE-projects or RE-projects in other parts of Germany, in which VBBW REPCs, municipalities, public utilities and other market actors can invest to become limited partners (*Kommanditisten*), i.e. they are only liable for their share in the company (BürgerEnergie AG 2013). The respective project companies (GmbH & Co. KGs) are operated by the management board of the BürgerEnergie AG and controlled by its advisory board, while the other partners are solely investing shareholders. For an overview on the organizational form of the BürgerEnergie AG see table 8.

Table 8: Organizational form of the BürgerEnergie AG

|                      |   |
|----------------------|---|
| <b>Legal Form</b>    | <ul style="list-style-type: none"> <li>• Joint-stock company (Aktiengesellschaft)</li> <li>• Founding capital: €50.000</li> </ul>   |
| <b>Function</b>      | <ul style="list-style-type: none"> <li>• Holding function for joint projects of REPCs</li> <li>• general managing partner of project companies</li> <li>• Acquiring of funding and co-investors</li> <li>• Acquisition of projects</li> <li>• Asset management</li> </ul> |
| <b>Shareholders</b>  | <ul style="list-style-type: none"> <li>• REPCs and other initiating actors</li> </ul>   |
| <b>Management</b>    | <ul style="list-style-type: none"> <li>• Management board, elected by the advisory board</li> </ul>   |
| <b>Control</b>       | <ul style="list-style-type: none"> <li>• Advisory board, elected by the general assembly that consists of municipal and REPC representatives + VBBW staff</li> </ul>  |
| <b>Revenue model</b> | <ul style="list-style-type: none"> <li>• Revenue basis: acquired projects + acquired capital</li> <li>• Share in the projects profits</li> </ul>  |

Source: (BürgerEnergie AG 2013).

The BürgerEnergie AG is compensated for its services by the respective project company, thus practically splitting the costs among the project partners. Nevertheless, the BürgerEnergie AG does not act as a RE-project development company, i.e. it is not involved in the technical planning and implementation of the RE-project and mainly connects energy providers, project development companies and REPCs (BürgerEnergie AG 2013; Strobel 2013). Therefore, the BürgerEnergie AG has also established a cooperation contract with the RE- subsidiary of EnBW AG, EnBW Erneuerbare Energien GmbH that offers shares in wind farm projects in the region and other regions in Germany. Here EnBW Erneuerbare Energien GmbH is the major shareholder and REPCS<sup>129</sup> can jointly invest by acquiring a minimum share of 37.5% of the project through the project company that is set up and managed by the BürgerEnergie AG. The maximum share REPCs can jointly acquire is 49,9% of the project<sup>130</sup>. Therefore, this approach can be classified as an indirect citizen participation model, as the strategic partner, i.e. EnBW Erneuerbare Energien GmbH, holds the majority of the RE-project, it is also in charge of all important decisions and the controlling of the

<sup>129</sup> Not restricted to VBBW members.

<sup>130</sup> Based on the example of the wind farm Berghühen/Schopfloch in Baden-Württemberg with four wind turbines and 8MW installed capacity, where a yearly interest of 5.5% is expected for the shareholders (BürgerEnergie AG 2013; SWP 2012).

project. Moreover, the BürgerEnergie AG has supported the realization of a 1,4 MW PV-park in Illingen, Baden-Württemberg, for a local stone and gravel extracting company and is responsible for the management of the subsidiary project company (EnBW 2012; BürgerEnergie AG 2013). These and other potential project offers of the BürgerEnergie AG are forwarded to the REPCs by the VBBW that also advises them on their project choice. In order to get involved in projects of the BürgerEnergie AG, a REPC has to buy at least one share of the BürgerEnergie AG at €100 (BürgerEnergie AG 2013). Although many VBBW REPCs are listed as partners on the website of the BürgerEnergie AG, it seems as if only two have so far invested in one of the EnBW Erneuerbare Energien GmbH wind farms through a project company set up by the BürgerEnergie AG. Moreover, there is no evidence that VBBW REPCs invested in or realized a PV-park together with the BürgerEnergieAG<sup>131</sup>.

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<sup>131</sup> Based on thorough research on the VBBW partner REPCs' projects on their websites.



## 5. Analysis

This chapter presents the case study analysis. The analysis is separated into four sections. First of all, the results of the questionnaire will be analyzed, followed by the results of the online research to avoid confusion of the data sources. Subsequently, the case studies will be analyzed. This approach follows the chronology of the research process and enables to first draw a comprehensive picture of support provision to sample cases and scores for the founding process and the durable collective action capacity of both the sample (N = 7) and control group (N = 15) cases. The qualitative analysis of the case studies then provides for a profound analysis of the utility and mechanisms of SO and PO support. In the last section, the results will be summarized in an overview on the most useful forms of support in the founding process and in terms of strengthening the collective action capacity.

### 5.1 Analysis of the questionnaire results

In the following, the results of the questionnaire are analyzed and compared. It has to be noted that the results of the questionnaire have only limited validity due to the low response rate of the sample group and the control group. While 15 control group REPCs out of 38 took part in the questionnaire, only seven sample group REPCs out of 37 participated. Nevertheless, the results have been useful in identifying divergences between the sample and control group REPCs and divergences of REPCs within the respective groups regarding the founding process and their durable collective action capacity, so that generic trends could be observed and four cases for further data collection could be selected.

First, with regard to the founding process, for an overview of the questionnaire results in terms of the sample and the control group scores on the founding process indicators and the utility of SO and PO support in the different tasks, see table 9.

Table 9: Scores on the dependent variable 'founding process' and the utility of SO and PO support

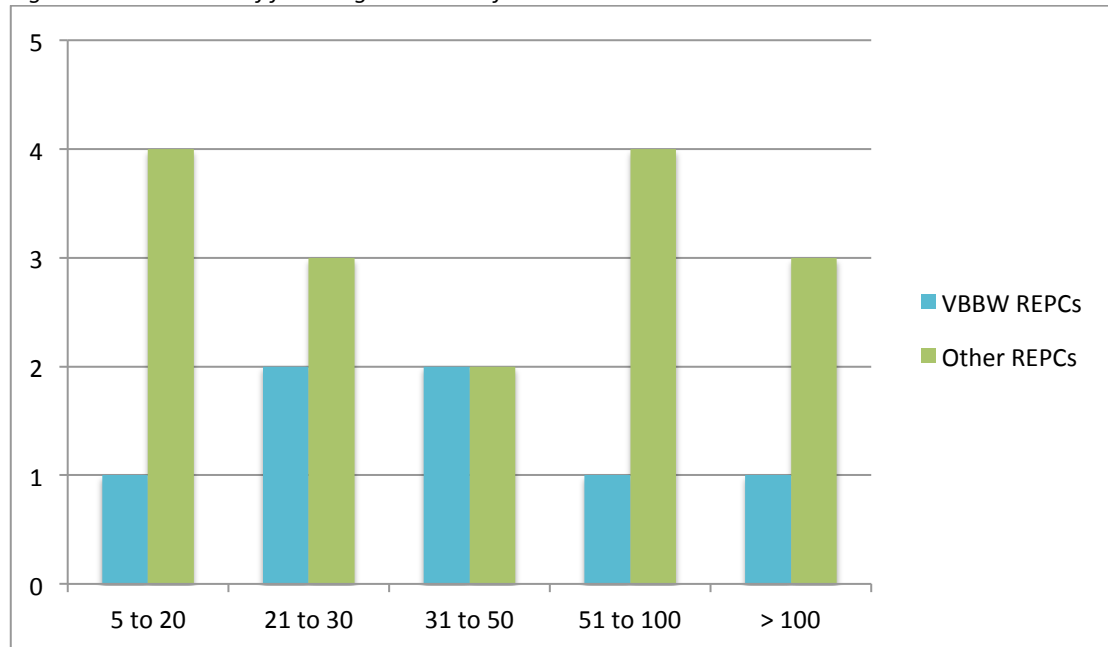
| Founding process         |  | VBBW REPCs score Ø (N=7) | Other REPCs score Ø (N=15) | Utility of SO & PO support Ø (N=7) |
|--------------------------|--|--------------------------|----------------------------|------------------------------------|
| <b>Orientation phase</b> | <i>Recruitment of like minded people</i>           | 3.4                      | 3.9                        | 2.4 <sup>132</sup>                 |
|                          | <i>Recruitment of skilled members</i>              | 3.6                      | 3.5                        |                                    |
|                          | <i>Decision-making on roles and tasks</i>          | 3.7                      | 3.5                        |                                    |
|                          | <i>Decision-making on business model</i>           | 3.7                      | 3.7                        | 2.4                                |
| <b>Planning phase</b>    | <i>Formulating a code of conduct</i>               | 4                        | 3.6                        | 3.6                                |
|                          | <i>Formulating a business plan for 1st project</i> | 3.6                      | 3.3                        | 2.1                                |
|                          | <i>Organization of the founding event</i>          | 4                        | 4.1                        | 3.9                                |
|                          | <i>Promoting the founding event</i>                | 3.9                      | 3.9                        | 3.3                                |
| <b>Founding phase</b>    | <i>Registration of the REPC</i>                    | 2.6                      | 3.5                        | 2.1                                |
|                          | <i>Number of members after the event</i>           | 48.6                     | 60                         | X                                  |
| <b>Project phase</b>     | <i>Site selection of the 1st PV project</i>        | 3.7                      | 3.9                        | 1                                  |
|                          | <i>Working out property user contracts</i>         | 3.4                      | 3.6                        | 0.7                                |
|                          | <i>Decision for PV-seller</i>                      | 3.3                      | 3.4                        | 0.4                                |
|                          | <i>Contract with independent auditor</i>           | 3.4                      | 3.1                        | 0.3                                |

<sup>132</sup> All three indicators are covered by the indicator SO support for the development of the interest group.

|   |  |                |                           |                |
|---|--|----------------|---------------------------|----------------|
|   | <i>FiT-contract with local grid operator</i> | 3.4            | 3.7                       | 0.9            |
|   | <i>Decision on PV-insurance</i>              | 3.7            | 3.7                       | 0.4            |
|   | <i>Generating external capital</i>           | 4.1            | 3.8 <sup>133</sup>        | 0.3            |
| <b>Total score Ø</b>  |  | <b>57.6</b>    | <b>58.3<sup>134</sup></b> | <b>23.9</b>    |
| <b>Scoring range</b>  |  | <b>(47-70)</b> | <b>(50-77)</b>            | <b>(18-37)</b> |
| <b>Highest score possible - REPCs: 80 points; SO and PO support: 70 points.</b> |  |                |                           |                |

First of all, it can be observed that the participants of the sample and the control group did not differ significantly in their responses. Accordingly, they found the necessary tasks in the founding process between acceptable and easy and could generate a similar amount of founding members. The distribution of founding members for both participant groups can be observed in figure 7, where the x-axis indicates how many founding members could be gained, while the bars indicate the distribution of cases.

Figure 7: Distribution of founding members of the cases



The number of founding members varies for both groups and is rather evenly distributed between five to >100 members. Due to the low number of participants it is however not possible to derive further conclusions about the distribution of founding members<sup>135</sup>. Second, it becomes clear that the support of the VBBW and the EnBW Regional AG was useful for the formulation of a code of conduct as well as for the organization and promotion of the founding event. Only one participant perceived the support provided by the VBBW and the EnBW for the organization of the founding event as less useful while four REPCs found it useful to very useful, and two participants found it somewhat useful. While only one participant did not find the support in terms of promoting the founding event useful, and two less useful, the majority perceived the support to be

<sup>133</sup> Here N= 14, as one of the REPCs financed their 1<sup>st</sup> project entirely with internal capital.

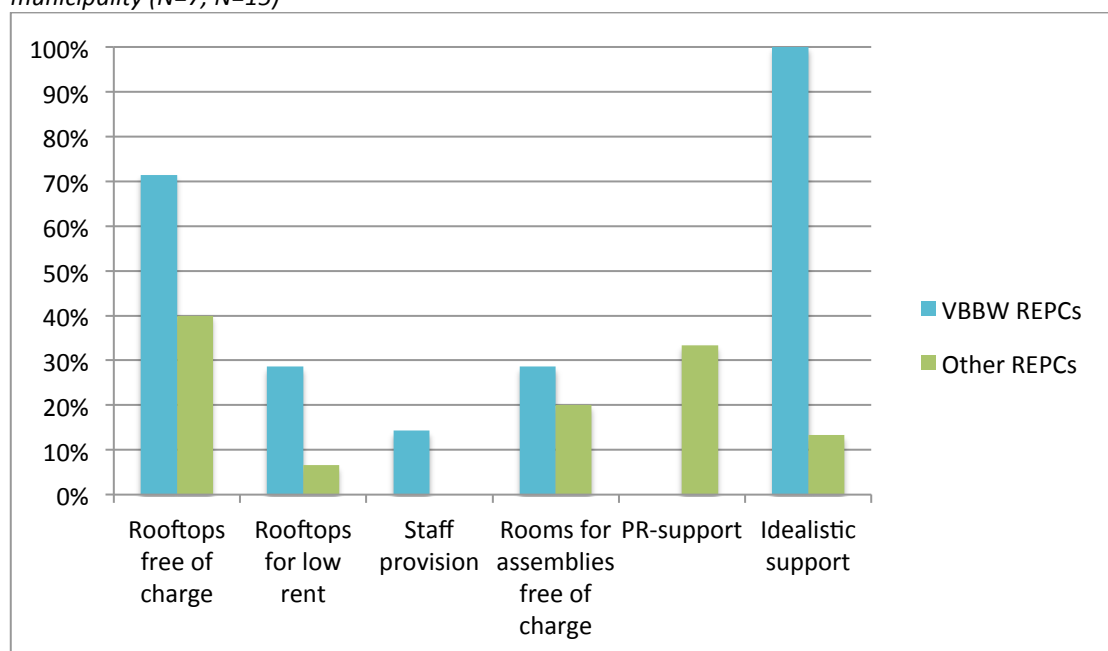
<sup>134</sup> Also N=14, as one of the REPCs was excluded. See footnote 133 above.

<sup>135</sup> The utility of this variable is generally questionable, as it became clear in the case study interviews that some REPCs deliberately founded their REPC with few members, to avoid long discussions on the code of conduct, when the founding members want to follow more specific goals with the REPC.

useful to mainly very useful. Third, the SO and & PO support was less useful for recruiting skilled and like-minded members, decision-making on roles and tasks of the members, decision-making on the business model and formulating a business plan for the first project. Additionally, support for the tasks in the project phase was, with few exceptions, either not present or of little use. It seems as if the support provided by the VBBW and the EnBW Regional AG that is perceived to be useful, e.g. providing sample code of conducts, co-organizing and hosting the founding event and consultancy meetings, corresponds to the support that also the two regional CAAs, BWGW and the GVB, provide.

Moreover, the questionnaire results also showed that the close cooperation of the VBBW and EnBW Regional AG with the municipality had a positive effect on start-up help provided the municipality. To see if the REPCs also received municipal support both participant groups have been presented with an open question, where they could write what support was provided by the municipality. The results can be observed in figure 8.

Figure 8: Forms of support the sample and the control group participants have received from the municipality (N=7; N=15)



First of all, it became clear that almost every sample and control group REPC was indicated to have received at least one form of more or less substantial support from the municipality. However, even with a small N it becomes clear that each participating VBBW REPC received more substantial support from their municipalities. Every sample group participant either got a rooftop from the municipality free of charge or for a low rent, while only less than half of the control group REPCs also received this form of support. The free or relatively cheap rooftops increase the profitability of the PV-project, thus relieving pressure on the REPC in terms of financial obligations. This also enables the REPC to pay their members a slightly higher dividend than without the free or cheap rooftops. One sample group REPC even got provided with staff for secretarial work and two out of seven VBBW REPCs additionally got provided with municipal rooms free of charge for their meetings and general assemblies. That additionally helped the REPCs to save costs as the rooms otherwise need to be rented, especially for the general assembly. Every VBBW REPC also received idealistic support, i.e. the municipality showed solidarity with the local REPC. For instance, the mayor wrote a welcome note into the flyer that was provided by the VBBW and EnBW Regional AG to promote the founding event in the community. Other forms of idealistic

support in both sample and control group included positive statements by city officials in public meetings, speeches etc. regarding the founding of the REPC. The control group only received more support from the municipality in terms of PR-support. This becomes clear when keeping in mind that the sample group REPCs got their PR-support provided by the SO and PO and were not reliant on municipal PR-support. In summary it can be stated that besides the lack of additional data from more cases, the SO and PO undoubtedly acted as a useful connector between the interest group and the municipality in terms of providing network and alliance-building support that could be used in the founding process of the REPC.

In the following, the results for the assessed durable collective action capacity of the respective REPCs will be presented. First, the variable human capital is analyzed. The results for human capital – comprising management capacity, organizational strength and connection to others – are similar to the results for the founding process and are shown in table 10.

Table 10: Scores on the dependent variable ‘human capital’

| Human capital   |   | VBBW REPCs<br>score Ø<br>(N=7)        | Other REPCs<br>score Ø<br>(N=15)     |
|---|---|---------------------------------------|--------------------------------------|
| <b>Management Capacity</b>  | <i>Management capacity FiT</i>                                  | 3.3                                   | 3.2                                  |
|   | <i>Management capacity direct marketing</i>                     | 3.1                                   | 3.1                                  |
|   | <i>Management capacity large PV-projects</i>                    | 3                                     | 3.4                                  |
|   | <i>Management capacity other large RE</i>                       | 2.3                                   | 3.3                                  |
|   | <i>Installed PV-capacity</i>                                    | 246.6 kWh                             | 764.6 kWh                            |
|   | <i>Latest installed RE-project<sup>136</sup></i>                | 9 points                              | 13 points                            |
|   | <i>Latest type of project realized</i>                          | 0 points                              | 1 points                             |
|   | <i>Latest type of project planned</i>                           | 6 points                              | 8 points                             |
| <b>Organizational strength</b>                                    | <i>Understanding of roles and task</i>                          | 3.9                                   | 4.2                                  |
|   | <i>General Replaceability of the management board</i>           | 3.1                                   | 3.2                                  |
|   | <i>Replaceability of management board with the same quality</i> | 3.4                                   | 3.3                                  |
| <b>Total score Ø</b><br><b>Highest score possible: 35 points.</b> |   | <b>22.1</b><br><b>(Range: 19 –28)</b> | <b>23.4</b><br><b>(Range: 13-29)</b> |
| <b>Connection to others</b>                                       | <i>Number of contacts (REPC internal)</i>                       | 14.7                                  | 12.5                                 |
|   | <i>Frequency of contact (REPC internal)</i>                     | 5.4 times a year                      | 19.9 times a year                    |
|   | <i>Number of contacts (REPC external)</i>                       | 12.4                                  | 8.2                                  |
|   | <i>Frequency of contacts (REPC external)</i>                    | 2.9 times a year                      | 6                                    |

First of all, it can be observed that both the participants of the sample group and the control group performed quite similar on the score for human capital, with few exceptions. Only in terms of perceived management capacity, all except one REPCs of the sample group participants does not think their REPC is able to realize larger RE-projects independently within the next five years, while eight of the control group participants are either sure or very sure their REPC is able to realize larger RE projects independently within the next five years. Six participants of the control group did not think their REPC is able to realize larger RE-projects independently within the next five years and one was not sure. This is an

<sup>136</sup> Excluding REPCs that have been founded after 2012, therefore sample group N=7 and control group N=11.

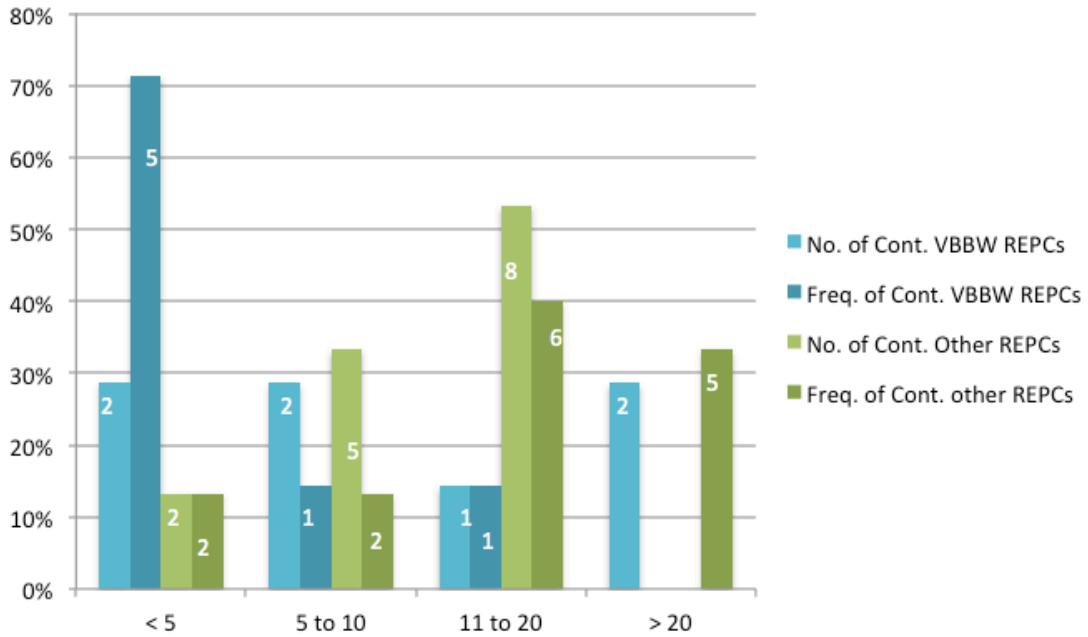
interesting observation as it was assumed that REPCs that receive support from an SO and PO would score higher on perceived management capacity, considering the higher challenges in the realization of larger RE-projects and that they get supplied with research and information resources, networking and alliance-building support and advocacy support by the VBBW. On first sight it seems as if the control group was also more successful in terms of installed PV-capacity, but this is due to the higher number of cases with more than 10.000 inhabitants, as the number of inhabitants positively correlates with the installed capacity. This became clear in the statistical analysis of the data obtained from the online research and will be further explained in the next section. Due to the low N of both participant groups, the performance on the indicators *latest installed RE-project*, *latest type of project realized* and *latest type of project planned* can also be hardly compared to one another.

Nevertheless, there does not seem to be a big difference between the sample (N=7) and control group (N=11) REPCs that have been founded before 2012 in terms of project realization between 2012 and 2014. While the control group REPCs managed to realize one free-standing PV-system and plan to realize another free-standing PV-system and two wind farms participations in a direct citizen participation model, the sample group REPCs did not realize a free-standing PV system but plan two wind parks in a direct citizen participation model. However, it is important to keep in mind that only one questionnaire participant of the sample group and only one questionnaire participant of the control group have not realized a project after 2011 and have no evident plans to realize another project. In the comparison of the data obtained from the online research, it became clear that both the potential sample and control group cases contained a number of inactive REPCs, i.e. no activity in terms of realized projects since 2011. Almost all of the participants of the sample and control groups belong to the 'active' REPCs, as the inactive REPCs did not participate in the survey. A further analysis of the management capacity based on the online research and interviews, in terms of *installed PV-capacity*, *latest installed RE-system*, *type of latest installed RE-system* and *type of latest planned RE-system*, will be presented after the analysis of the questionnaire results for the variables intrinsic and extrinsic motivation in order to avoid confusion of the two analyzed data sets.

It is also interesting to take a closer look at the performance of both groups on the variable *connection to others*, as there seems to be divergence in the responses. Figure 9 gives an overview on the distribution of the number of internal contacts and contact frequency of both the sample and the control group. The sections on the x-axis separate the participants' answers into groups ranging from < 5 to >20, indicating with how many other members the participants meet frequently and how many times a year contacts have been made to other members, while the numbers in the bars indicate how many answers of the participants could be sorted into one of the four x-axis groups (sample group N=7, control group N=15). The percentage on the y-axis indicates the distribution of answers from both the sample and control group. As the percentage refers to the sample and control group, respectively, they cannot be compared directly to one another due to the low N. Nevertheless, they can serve as a visual aid to recognize trends in responses.

While the majority of the control group participants meets with five or more than ten other members frequently, the majority of sample group participants meets less than five and less than 21 members frequently. Moreover, the control group participants also meet more frequently, with six cases that meet between 11 and 20 times per year and five cases that meet more than 20 times a year with the other members, while the majority of sample group participants meets less than five times per year. In this regard the questionnaire participants of the control group performed better in terms of human capital as frequent meetings with other participants in collective action situations create trust and identification among the members and can contribute to the durability of a group's

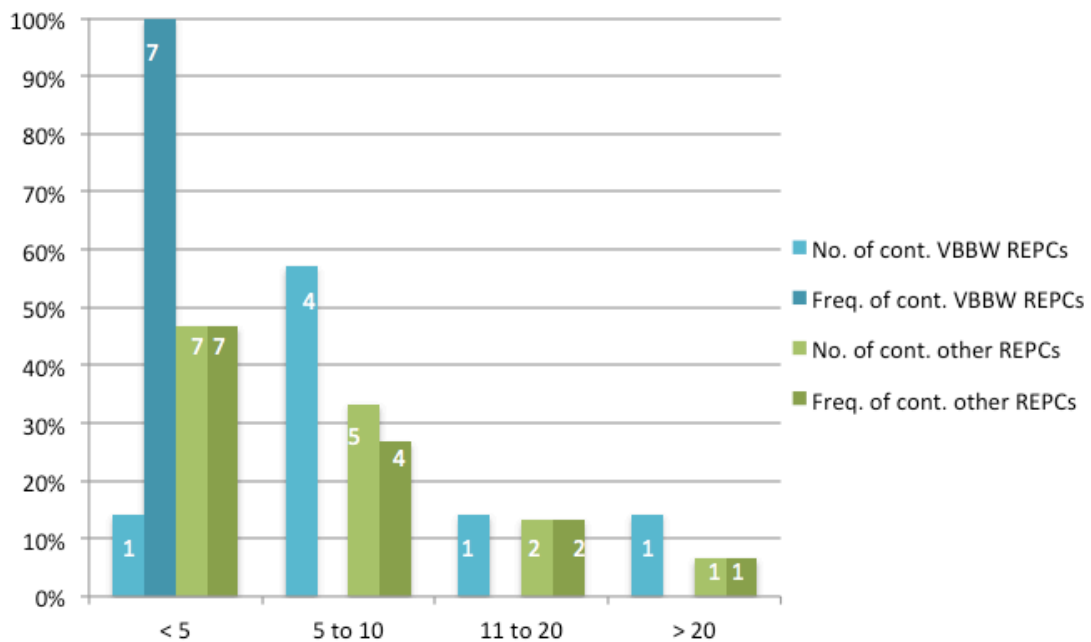
Figure 9: Comparison of the distribution of the sample and control group survey participants



collective action (Leach & Sabatier 2005). Additionally, the fact that the majority of the control group participants frequently meets with more than five to 20 members shows that more than just the management and advisory board members are at least actively involved in the REPC by frequently meeting other members, which ensures that not everything depends solely on a small core group of active members and that more members are up-to-date on the internal issues of their REPC. Nevertheless, it is not useful to draw conclusions in comparison to the sample group participants regarding the number of contacts as the results do not show a clear trend as for the contact frequency.

However, the organization of the control group REPCs under the VBBW seems to be advantageous in terms of contacts to VBBW members or other REPCs as can be observed in figure 10.

Figure 10: Comparison of the distribution of the number and frequency of external contacts



While the majority of the sample group participants meets with five to ten members of other REPCs frequently, the majority of control group participants meets with ten or less members of other REPCs frequently. Here it is interesting to note that ten of the control group participants meet with five or less members of other REPCs, while four of the sample group participants meet with ten members of other REPCs on a frequent basis. The majority of sample group participants meets around two to three times a year with other REPCs and it became clear that these meetings are the VBBW's annual general assemblies and regional network and information meetings<sup>137</sup>. However, it seems that although the largest share of control group participants has frequent contact to only five or less members of other REPCs, they generally have more frequent contact to the members of other REPCs in comparison to the sample group. Accordingly, it can be stated that although the institutionalization of VBBW member meetings supports the contact to more other REPCs that in turn offers more potential opportunities to exchange information and experiences, it does not necessarily guarantee that REPCs also meet outside of those assemblies with other VBBW members.

In the following, the results of the questionnaire for the intrinsic and extrinsic motivation will be presented. The results of the questionnaire for the variables and their respective indicators can be viewed in table 11.

Table 11: Scores on the dependent variable

| Intrinsic & extrinsic motivation |   |  | VBBW REPCs score Ø    | Other REPCs score Ø           |                               |
|----------------------------------|---|--|-----------------------|-------------------------------|-------------------------------|
| Intrinsic motivation             | Civic Gratification                                       | <i>Interest in local/regional projects</i>                               | 4.7                   | 4.6                           |                               |
|                                  |   | <i>Conviction that personal engagement leads to regional added value</i> | 4.4                   | 4.4                           |                               |
|                                  |   | <i>Conviction of REPC work as civic duty</i>                             | 4.3                   | 4.3                           |                               |
|                                  | Social gratification                                      | <i>Enjoyment of working with others</i>                                  | 4.4                   | 4.3                           |                               |
|                                  |   | <i>Perceived appreciation by others</i>                                  | 4.1                   | 4.6                           |                               |
|                                  | <b>Total score Ø</b><br>Highest score possible: 25 points |  |                       | <b>22.1</b><br>(Range: 20-25) | <b>22.3</b><br>(Range: 20-25) |
| Extrinsic motivation             | Confidence in future benefit                              | <i>Conviction that personal engagement in the REPC is important</i>      | 4                     | 3.7                           |                               |
|                                  |   | <i>Personal benefit expectations from engagement</i>                     | 3.6                   | 4.3                           |                               |
|                                  | <b>Total score Ø</b><br>Highest score possible: 10 points |  |                       | <b>7.6</b><br>(Range: 6-10)   | <b>7.9</b><br>(Range: 6-10)   |
|                                  | Presence of a non-monetary incentive system               | Presence of a non-monetary incentive system                              | 1/7 = Yes<br>6/7 = No | 2/15 = Yes<br>13/15 = No      |                               |
|                                  |   | Plans to implement a non-monetary incentive system                       | 1/7 = Yes<br>5/6 = No | 1/13 = Yes<br>12/13 = No      |                               |

First of all, it can be observed that both the participants of the sample group and the control group seem to possess a high level of intrinsic and extrinsic motivation. All participants seem to have a strong sense of awareness of their collective action as a

<sup>137</sup> It became clear through conducting on of the semi-structured interviews with one of the sample group participants.

contribution to the regional added value and as a civic duty for their community. They enjoy the work with other active members and perceive their personal work contributions to be appreciated by their peers. The majority of participants also perceives their personal engagement as important for reaching the goals of their respective REPC and expects to benefit personally from their engagement. However, it has to be noted that it became clear during the semi-structured interviews that the participants' understanding of the questions regarding their conviction that their personal engagement is important to reach the REPC's goals and the personal benefit expectations varied and therefore the results are somewhat impaired. The same holds true for the questions regarding the presence or the planning of a non-monetary incentive system, e.g. when the interview participants were specifically asked if the REPC pays for occurring personal costs of the management board members, related to their work for the REPC such as costs for gas related to REPC business trips etc., all participants confirmed that such a system is used informally. In summary, the results imply that the support of a SO and a PO has no impact on the intrinsic and extrinsic motivation of active REPC members to conduct their collective action.

## *5.2 Analysis of the online research results*

In order to gain further insights into the management capacity of the sample group and the control group, the results of the online data research will be analyzed in the following. To put the obtained data into a wider context, some of the data is compared to the national average. It was possible to gather enough data to conduct a statistical analysis on several indicators and test them for correlations that will be presented in the following. While trying to find out why the sample group participants of the questionnaire scored significantly lower on installed PV-capacity it became obvious that the distribution of municipalities with more than 15.000 inhabitants was significantly higher in the control group questionnaire participants. Therefore, data on the municipality size in terms of inhabitants of every possible case was also collected and analyzed. In order to find out if the number of current members correlates with the other indicators, websites have also been scanned for the number of current members. The number of PV-projects was also included to see if the installed capacity is related to the size of projects that the sample and control group realized. Accordingly, the following indicators have been analyzed and tested with SPSS for correlation: number of inhabitants, installed PV-capacity, number of projects realized, and current number of members. Moreover, it was possible to map the distribution of the latest project realized between 2009 and 2014 by both the sample and control group and to compare them to another. The results will be presented in the following.

An overview on the results of the indicators *size of the municipality, number of current members, number of installed PV-systems and installed PV-capacity* for all cases of the control and sample group is given in table 12. This will help to interpret the results of the questionnaire as some of the divergence in in the questionnaire results can be explained and put into context.



Table 12: Overview on the analyzed indicators about the sample group and the control group

| Indicators                     | VBBW REPCs score                     | Other REPCs score                    |
|--------------------------------|--------------------------------------|--------------------------------------|
| Size of the municipalities     | 600-27,000 inhabitants               | 1,300 - 26,000 inhabitants           |
| Number of current members      | 159.4 $\emptyset$ <sup>138</sup>     | 190.3 $\emptyset$ <sup>139</sup>     |
| Number of installed PV-systems | 4 $\emptyset$ <sup>140</sup>         | 4.5 $\emptyset$ <sup>141</sup>       |
| Installed PV capacity in kWh   | 197.1 kWh $\emptyset$ <sup>142</sup> | 536.3 kWh $\emptyset$ <sup>143</sup> |

It becomes clear that also in a comparison of a larger N of sample and control group REPCs, the average installed PV-capacity is significantly higher in the control group. However, it is also interesting to note that the sample group participants, which answered the questionnaire, had a higher average installed PV-capacity than the total average of potential sample group cases (246,6 kWh vs. 197,1 kWh), while the control group survey participants had a higher average installed PV-capacity in comparison to all potential control group participants (764,6 kWh vs. 536,3 kWh). This can be explained as follows. After all the indicators of all cases that have been tested for correlation with SPSS it became clear that there is a positive correlation between the municipality size and the installed PV-capacity, while there seem to be no significant correlations between the other indicators. The relevant results can be viewed in table 13.

Table 13: Correlation between size of the community and other variables

|  |                     | Size of the community | Number of projects | Number of Members | Installed PV-capacity |
|--|---------------------|-----------------------|--------------------|-------------------|-----------------------|
| Size of the community                                      | Pearson correlation | 1                     | ,074               | ,198              | ,351**                |
|  | Sig. (2-tailed)     |                       | ,563               | ,119              | '009                  |
|  | N                   | 75                    | 63                 | 63                | 55                    |
| **Correlation is significant at the 0.01 level (2-tailed). |                     |                       |                    |                   |                       |

Since the control group REPCs has a higher average number of inhabitants and installed PV-capacity, the difference in installed PV-capacity for both the participants of the questionnaire and all potential cases can be explained as follows. The size of the municipalities in which the sample group REPCs were founded, ranged between 600 and 27.000 inhabitants. Only nine REPCs have been founded in municipalities with more than 10.000 inhabitants, while the majority (26) was founded in municipalities with less than 10.000 inhabitants, of which 17 have less than 5.000 inhabitants. The obtained data from the control group is similar, but contains a higher number of municipalities with more than 10.000 inhabitants. While 15 REPCs have been founded in municipalities with more than 10.000 inhabitants, including 12 municipalities with more than 15.000 inhabitants, the majority (24) has been founded in municipalities with less than 10.000, of which half have less than 5.000 inhabitants. Also the control group survey participants contained a significantly higher amount of municipalities with more than 10.000 in comparison to the sample group participants, as only one sample group REPC that took the survey was founded in a municipality with more than 10.000 inhabitants. For an overview of the sample and control group's municipality sizes see figure 11.

<sup>138</sup> Based on an N=37.

<sup>139</sup> Based on an N=26, due to gaps in the data.

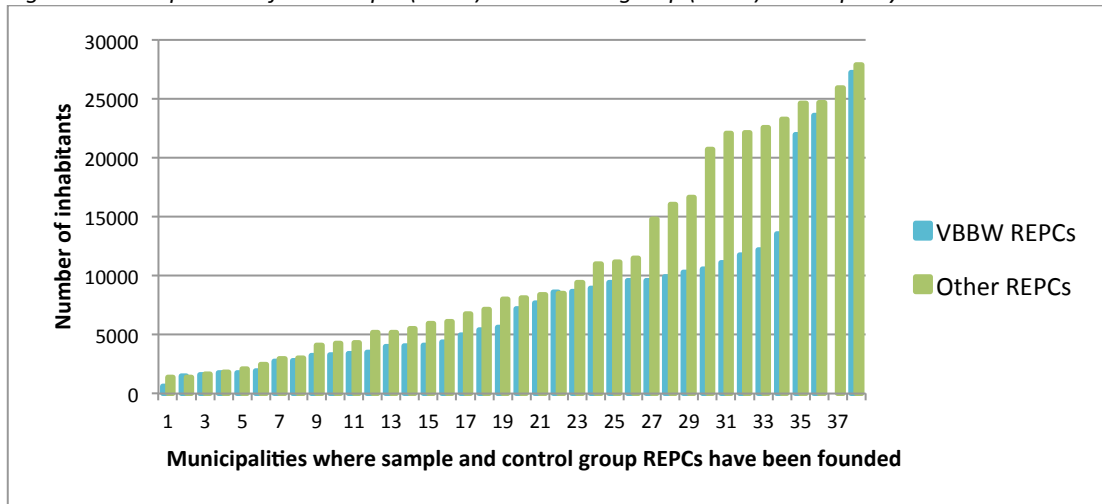
<sup>140</sup> Based on an N=33, due to gaps in the data with a range from 3-14 installed PV-systems.

<sup>141</sup> Based on an N=29, due to gaps in the data with a range from 1-12 installed PV-systems.

<sup>142</sup> Based on an N=27, due to gaps in the data with a range from 20-1,000 installed kWh per REPC.

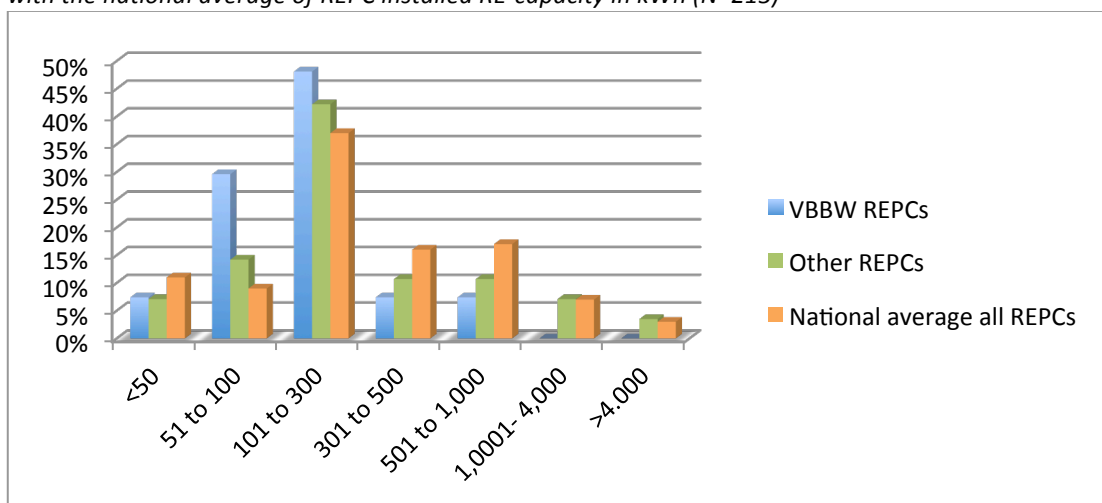
<sup>143</sup> Based on an N=28, due to gaps in the data with a range from 20-4000 installed kWh per REPC.

Figure 11: Comparison of the sample (N=37) and control group (N=38) municipality size



Accordingly, the higher number of municipalities with more than 15.000 inhabitants explains why the control group scored significantly higher than the sample group in terms of installed PV-capacity, although they only realized 0,5 more projects on average. In this regard it can also clearly be seen in figure 12 that the VBBW REPCs have a larger share of installed capacity below 300 kWh, in comparison to the control group REPCs and the national average<sup>144</sup>.

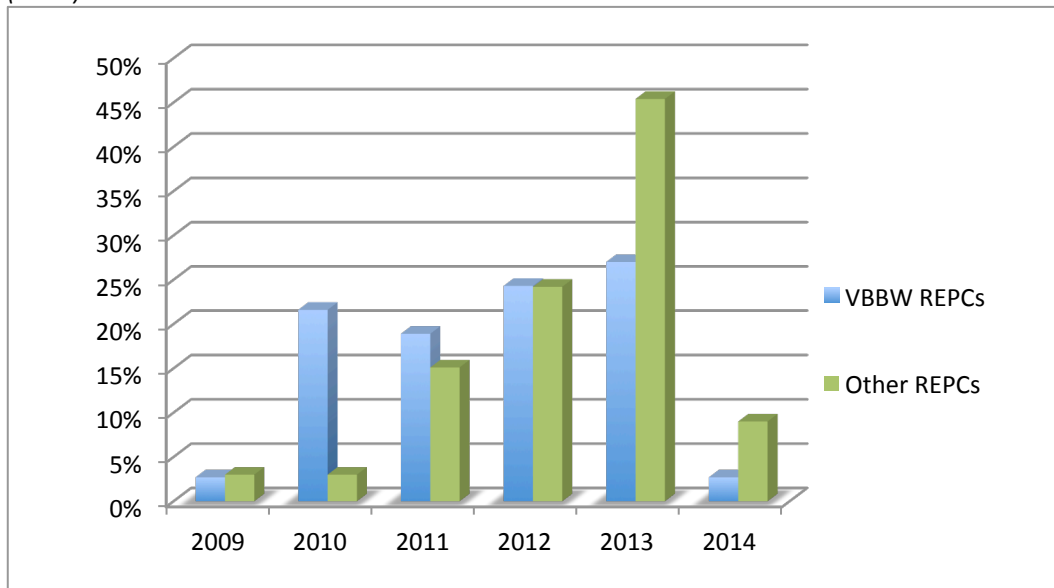
Figure 12: Comparison of the sample (N=27) and control (N=28) group's installed PV-capacity in kWh with the national average of REPC installed RE-capacity in kWh (N=213)



In sum, at this point it would therefore not be useful to draw further conclusions about the installed PV-capacity of the sample group and the control group regarding the collective action capacity and/or the impact of SO and PO support. However, the analysis of the data collected about the sample and the control group's latest activity in terms of project realization proved to be more fruitful to draw further conclusions about the collective action capacity in both groups and will be presented in the following. Figure 13 shows the distribution of latest RE-projects realized by the sample and the control group.

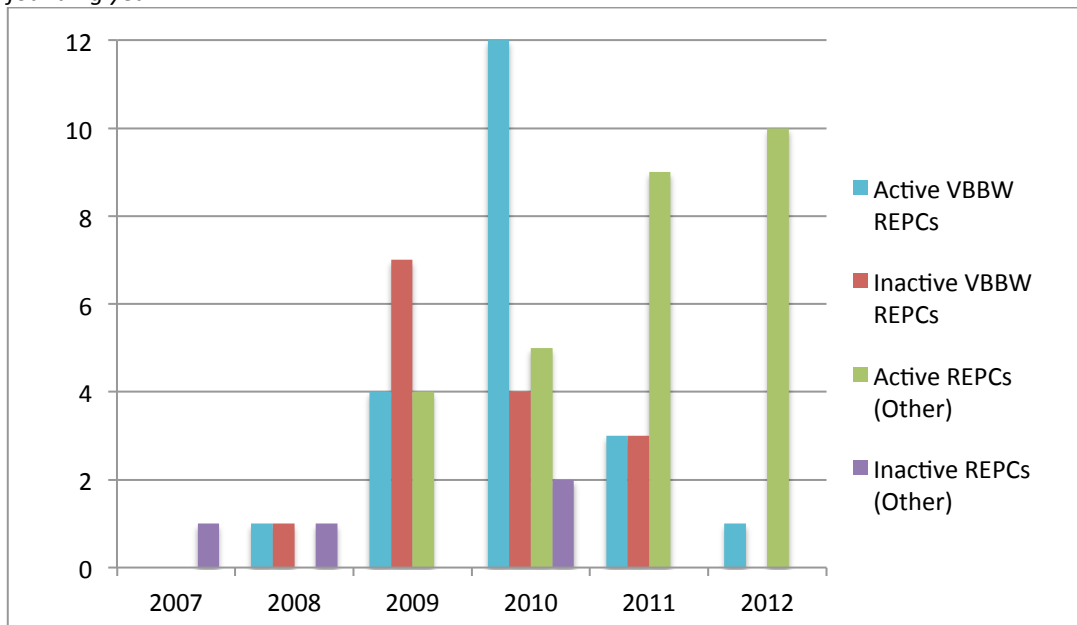
<sup>144</sup> In comparison to the sample and control group cases, the cases for the national average also include municipalities with more than 30.000 inhabitants (DGRV 2013a), but it is important to keep in mind that 2/3 of REPCs in Germany have been founded in rural areas (Maron & Maron 2012).

Figure 13: Distribution of latest RE-projects realized by the sample group (N=37) and the control group (N=32)



On first sight it seems as if the control group REPCs have been more active in terms of project realization between 2012 and 2014. In order to see if the activity is related to the REPCs' founding year, a comparison of active REPCs, i.e. latest project realization between 2012 and 2013, and inactive REPC, i.e. latest project realized before 2012, based on their founding year is presented in figure 14.

Figure 14: Distribution of active and inactive sample group and control group REPCs based on their founding year



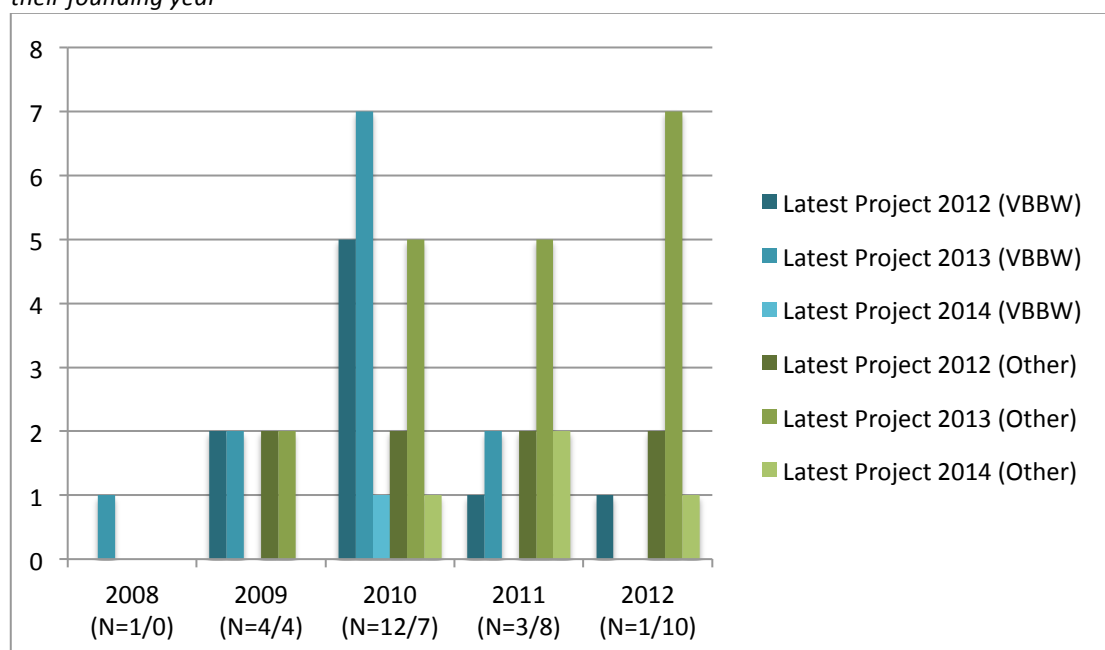
Generally it can be observed that a larger part of the control group has been more active in comparison to the sample group in recent years. While around 50% the sample group REPCs realized their latest RE-projects between 2012 and 2014, almost 80% of the control group REPCs realized their latest RE projects in the same time-span. At the same time, almost 40% of the VBBW REPCs realized their latest project between 2009 and 2011, while only around 20% of the other REPCs realized their latest RE projects in the same time-

span. Accordingly, a distinction within the sample and control group, between *active* and *inactive* REPCs can be made. Here it is interesting to note that the absolute number of inactive sample group REPCs is almost twice as high as the absolute number of inactive control group REPCs. Furthermore, the inactive REPCs of the sample group scored significantly lower on installed PV-capacity with 109,7 kWh and 2,9 PV-projects on average in comparison to the inactive control group REPCs that installed 210,8 kWh and 7,5 PV-projects. The difference is even more striking when considering that all the inactive sample and control group REPCs are situated in municipalities below 10.000 inhabitants and thus in this case the municipality size does not influence the installed PV-capacity.

It cannot be clearly answered at this point why the sample group contains a significantly higher amount of inactive REPCs. One assumption that can be made is that the majority of inactive sample group REPCs was hesitant to make further investments due to the EEG-debate that started in 2012 and the significant drops in FiTs that came into effect on 1<sup>st</sup> April 2012 with the amended EEG 2012. This is also reflected in the number of foundings of VBBW REPCs in municipalities with less than 30.000 inhabitants, as the number of new foundings significantly dropped in 2012. Moreover, all REPCs of the control group that have been founded in 2012, have been founded before 1<sup>st</sup> April. However, only two out of ten REPCs in the control group that have been founded in 2012 also realized their latest project in 2012, while the rest made further investments in small to medium-sized PV-projects. Based on the distinction of the sample group into institutional-organizational REPCs and of the control group into civic-ecological and socio-political REPCs it could moreover be assumed that the inactive VBBW REPCs stopped investing with the sinking profitability of PV-projects, while a larger share of control group REPCs did not seem to be affected as much in their collective action, as the financial profitability of projects is not the main priority of these types of REPCs. Additional research on the sample group REPCs also showed that almost all VBBW REPCs were provided with municipal roofs for their first project, as stated above. Based on the questionnaire results it can be assumed that the majority of them were also provided either free of charge or for a low rent. Therefore, it is possible that the inactive REPCs had no more roofs available that were provided free of charge and did not see other options than realizing FiT-based PV-projects on rent-free rooftops as projects that could fulfill the profit expectations in comparison to the projects that have been realized before the FiTs dropped significantly in April 2012. The roof rent can pose a cost that can considerably reduce the profitability of a project depending on the amount of rent that the roof owner charges. However, this does not offer a sufficient explanation, as it does not entirely answer why the active REPCs of the sample group kept on investing in small to medium-sized projects after 2011. Although it does not become entirely clear from the data why the control group as a whole seems to be more active than the sample group in terms of realizing new projects, it can be assumed that the collective action capacity of almost 40% of the sample group is for one or several of the above mentioned reasons impaired in terms of their management capacity in comparison to only 20% of the control group REPCs, i.e. they either cannot and could not realize new projects for whatever reasons or they are and were not willing to risk realizing new projects under the investment insecurities that arose from the political debate about the EEG-reforms.

In order to see if the active REPCs of the sample and the control group differ in terms of latest realized RE-project it is useful to compare the distribution of latest projects realized between 2012 and 2014 based on the founding year of the REPCs. As shown in figure 15, the sections on the x-axis indicate the founding year of the REPC, while the number of realized projects is indicated in the different bars that show when the latest projects were realized.

Figure 15: Distribution of latest project realized by active sample and control group REPCs according to their founding year



As shown in figure 15, around 90% of VBBW REPCs have been founded between 2009 and 2011, while almost 80% of the control group REPCs have been founded between 2010 and 2012. Moreover, it can be observed that a large part of the control group cases that have realized their last PV-project between 2012 and 2014 were founded in 2012. Therefore, it is useful to take a closer look at the distribution of projects between the groups between the founding years 2009 and 2011. While the active VBBW REPCs that were founded between 2009 and 2013 realized eight projects in 2012, eleven projects in 2013 and one project in 2014, the active control group REPCs realized six projects in 2012, twelve projects in 2013 and three projects in 2014. The active sample and control group REPCs scored fairly similar with an average installed capacity of 214,4 kWh and five PV-projects for the active sample group REPCs and average installed 275,2 kWh and 4,2 PV-projects realized by the active control group REPCs. The slightly higher installed PV-capacity in kWh can be attributed to the fact that the active control group cases contained six REPCs that have been founded in municipalities with more than 10.000 inhabitants that is also reflected in their installed PV-capacity as every REPC scored above 250 kWh and one REPC with more than 20.000 inhabitants even installed more than 1 MWh of PV-capacity.

When taking into account that a large part of the active sample group REPCs was founded in 2010 and a large part of active control group REPCs was founded in 2011, it can be observed that there is no significant difference between the active sample (N=19) and control (N=19) group REPCs. In terms of realizing small to medium PV-projects it therefore does not seem to make a difference for active sample group REPCs to have received support in the founding process or ongoing support from the VBBW and EnBW Regional AG, as other active REPCs in the control group performed quite similar in this aspect. Their continuing collective action seems to be due to other factors, e.g. availability of sites were FiT-based projects can still be profitably implemented<sup>145</sup>, skilled and motivated members that are able to realize PV-projects based on direct marketing models to consumers in close proximity and that are also eager to diversify their RE-portfolio in terms of realizing larger RE-projects and/or due to larger available personal capacities in terms of number of active members and available time for the voluntary work. This is already reflected in the responses from the

<sup>145</sup> E.g. private or municipal rooftops that can be offered free of charge or for a low rent to the REPC.

sample group survey regarding the support for their first project, as no one found it particularly useful and all but one participant have been active between 2012 and 2014. It implies that both active sample and control group REPCs seem to be equipped with skilled and dedicated members that drive the further developments of projects. However, it does not explain why, on the one hand, the share of inactive REPCs is larger in the sample group and, on the other hand, they also perform worse in terms of installed PV-capacity in comparison to the inactive control group REPCs.

The active REPCs of both the control and the sample group also do not differ much in terms of type of latest realized RE-project or plans to install new RE projects. The largest share for both the sample and control group regarding the latest installed RE-technology was rooftop PV-systems. However, it was not clear if they mainly used FiT-based business models or business models that foresee that electricity is marketed to a customer in close proximity. The results based on the scoring system can be observed in table 14.

*Table 14: Comparison of the scores regarding the latest activity in terms of project realization for the sample group (N=22) and the control group (N=32)*

| Indicators                             | VBBW REPCs | Other REPCs |
|--|------------|-------------|
| <i>Latest type of project realized</i> | 7 points   | 9 points    |
| <i>Latest type of project planned</i>  | 16 points  | 18 points   |

The sample group realized three wind farms or wind-farm participations between 2012 and 2014, of which two were realized through indirect citizen participation models in collaboration with the BürgerEnergie AG by investing in EnBW owned and operated wind farms<sup>146</sup>. Additionally, plans to realize three wind farm projects, one small hydro power plant and two PV-parks have been made by REPCs of the sample group between 2012 and 2014 of which all are planned as direct citizen participation models. Although the BürgerEnergie AG was developed by the VBBW and EnBW Regional AG as a vehicle for REPCs to participate in larger RE-projects, it does not seem to be the first option for VBBW REPCs.

While, up to date the sample group has been more active in realizing wind energy projects or project participations, the control group has been more active regarding the installment of large free standing PV-systems. In the same timespan, i.e. 2012 to 2014, the control group REPCs realized one wind farm through an indirect citizen participation model and four free standing PV-systems<sup>147</sup>, of which three have been planned as direct citizen participation models. Moreover, the control group REPCs have made plans between 2012 and 2014 to realize four wind parks<sup>148</sup> and one free standing PV-system through direct citizen participation models with other regional partners. Nevertheless, two wind farm project participations of the sample group have been realized through a passive participation model, while only one wind farm of each the sample and control group is also factually co-managed by a REPC. In this regard the management capacity of both the active REPCs of the sample and control group does not seem to differ a lot only in that more control group REPCs have realized more free-standing PV-systems. However, most PV-parks have been realized by REPCs in communities with more than 10.000 inhabitants, while only one PV-park has been realized by a REPC in a community with less than 5.000 inhabitants.

<sup>146</sup> It has to be kept in mind that the business model of the BürgerEnergie AG is seen as a passive participation model, since participating REPCs are not practically involved in the planning of the project and cannot buy the majority of shares of the RE-project.

<sup>147</sup> The first free standing PV-system was already realized by one of the control group REPCs in 2011, but was not counted here, as it did not fit the depicted time frame that indicates recent activity of the REPC.

<sup>148</sup> Including three control group REPCs that have been inactive regarding RE projects since 2011.

From the available information it also became clear that all active sample and control group REPC plans include jointly erecting and managing new large RE-systems in their respective region with other regional market actors or REPCs, rather than investing in already existing wind farms in other parts of Germany.

Before diving into the four case studies that are mainly based on semi-structured interviews, a brief summary is given that integrates the analysis of the survey with the online research. In sum, it can be stated that there was no evidence that the sample group REPC, having received support from the VBBW and EnBW Regional AG, performed better in the founding process and in terms of durable collective action capacity than the control group REPCs. An exemption represents the perceived management capacity to realize large RE-projects independently. Here eight control group survey participants out of 15 indicated that were sure to very sure about their abilities, and six out of seven sample group respondents did not think their REPC is able to realize larger RE-project independently within the next five years. The active REPCs performed fairly similar in terms of their installed PV-capacity, their latest project installed and the type of latest installed RE-project as well as the type of latest planned RE-project. The inactive REPCs were however not only larger in number in the sample group, but also performed worse in terms of installed PV-capacity in comparison to the control group REPCs in municipalities with less than 10.000 inhabitants. In terms of their number of contacts to other REPCs, VBBW REPCs seem to benefit from the networking and alliance-building support provided through the VBBW meetings, as they meet more members of other REPCs on a frequent basis and received more substantial support from their municipalities, i.e. the provision of free or low-rent roofs. The control group REPCs, in comparison, were generally meeting less members from other REPCs but more frequently. Finally, both the participants of the sample group and the control group seem to possess a high level of intrinsic motivation that seems to be independent from the involvement of a SO or a PO in the founding process and the later development of the REPC. In the following, the four cases will be presented to gain further insights on the role and utility of ongoing VBBW and EnBW Regional AG support and support in the founding process.

### *5.3 Analysis of the cases*

In the following sections the four cases that have been selected from the questionnaire participants – two from the sample group and two from the control group – will be presented. In order to analyze the cases in terms of their level of difficulty to conduct the necessary tasks in the founding process, first the founding process and the background of active members will be briefly described to gain insights on why the different REPCs scored respectively high or low on the indicators in the founding process. The sample group cases, A and B, will be further analyzed in terms of SO and PO support in the founding process to find out why the support in different task of the founding process was perceived to be useful, and what specific forms of support had the highest utility for the participants. This is followed by a brief analysis of the role of the municipality and the regional CAA for all cases to see if these SOs or POs had an impact on the founding process. Subsequently, all cases will be analyzed in terms of durable collective action capacity. Hereby, first human capital is analyzed on the basis of their responses in the questionnaire to find out why they scored respectively high or low on specific indicators and to draw conclusions about their collective action capacity. In order to find out what specific forms of ongoing support after the founding process are and were useful, the responses of the sample group interviewees are analyzed on what forms of support from the SO and PO they received or still receive and how and why they are useful for the management and the organization of the REPC. An analysis of the participants' intrinsic and extrinsic motivation is mainly left out, as all participants score similarly high on the related indicators. These variables were sufficiently assessed by the survey and online research results and will be returned to in 3.4, which

integrates the results. At the end of each case study a brief summary of the main results will be presented.

### 5.3.1 Case A

Case A represents a small institutional-organizational REPC of the sample group cases with less than 100 members that was founded in a small community with less than 10.000 inhabitants in 2010. It has realized its last RE-project in late 2012. The REPC has three active members that jointly planned and currently manage less than five small PV-systems on municipal rooftops.

As the REPC scored significantly higher than other REPCs on the variable founding process (70/80 points) and the indicators regarding SO and PO support (37/70 points)<sup>149</sup>, it is interesting to take a closer look into the founding process of the REPC to see why they perceived the support of the SO and PO so useful. Although local citizens manage the REPC, the VBBW and EnBW Regional AG played a key role in the founding process of the REPC. The initiative to establish a local REPC came from EnBW Regional AG, and representatives of the SO and PO proactively approached the mayor and asked if they could hold an informational event on their founding concept for the municipal council, to see if there is general interest to found a REPC. After the mayor allowed to hold the information event, the VBBW and EnBW Regional AG representatives gave a presentation on their founding concept and subsequently asked the attendees if there was a serious interest in forming a local REPC, which received a positive response. Accordingly, the municipality offered municipal rooftops for projects free of charge to for the REPC-to-be. In the following, the VBBW and EnBW Regional AG organized and promoted the founding event in local newspapers and with informational flyers. The first PV-project was planned and proposed by EnBW Regional AG with a ready-made business plan for the FiT-based project. The founding event was hosted by VBBW and until the founding event local citizens were uninvolved in the founding process. Only in the founding event members of the community volunteered for the management board, including three members with respective professional backgrounds in public relations, electrical engineering and financial accounting. Due to their professional backgrounds the management board did not find it hard to get acquainted to the project development tasks that are necessary to develop small PV-systems. This explains why the REPC scored so high regarding the founding process and the utility of SO and PO support<sup>150</sup> and it is interesting to note that the interviewee is sure that the REPC would not have been founded without the VBBW and EnBW Regional AG. However, the interviewee also pointed out that the municipality played an important role as they supported the REPC with free municipal rooftops and idealistic support in the promotion of the founding event, i.e. welcoming note of the mayor in the informational flyer for the founding event. Moreover, the municipality is a member of the REPC as a legal person and is represented through the mayor that was elected into the advisory board to explicitly establish a direct connection to the municipality. This is perceived to be useful in terms of gaining local legitimacy in the community and common practice in the founding concept of the SO and the PO. The regional cooperative association only played a comparably small role in the founding process. At the time the REPC was founded the regional CAA was not perceived to be very useful, especially since REPCs were still a new concept for the CAA and the VBBW and

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<sup>149</sup> As all other sample group participants the REPC did not perceive the support in the first project to be useful and in many points not even present, which made up around 35 points of the total score.

<sup>150</sup> As the members were involved in the implementation of the first project, it also explains why they did not perceive it to be difficult and why they indicated that the support from the EnBW Regional AG regarding the project was not particularly useful for them personally, only in terms of site selection and formulating the business case.



EnBW Regional AG took care of the essential tasks in preparing the founding documents, as well as organizing and hosting the founding event. However, the biannual audits by the CAA are perceived to be useful in terms of on-going support<sup>151</sup>, as well as the recently installed position of a REPC agent in the CAA, that can be called free of charge for specific questions and problems.

Case A also scored well regarding the sub-variable of human capital as element of durable collective action, i.e. management capacity. In order to find out why the REPC scored so well regarding the management capacity it is useful to examine the phase after the founding process. The further development right after the founding process was strongly supported by the VBBW, so that the active members could work themselves step-by-step into their roles. The VBBW provided the REPC with schooling and introductions to the role of the management and advisory board and related task, as well as schoolings on the use of the member administration program that is provided for free by the EnBW Regional AG. This was perceived to be very useful as it made it easier to adjust to their roles. The member administration software is perceived to be an important tool since it saves a lot of time and makes it easy to prepare the annual statements, member dividends and taxing matters. Additionally, the VBBW provided consultancy meetings together with EnBW Regional AG staff and gave out information to help active members to learn how to plan and implement small PV-projects based on FiTs. Due to their professional backgrounds and the SO and PO support the active members do not perceive the management of small-scale PV-rooftop systems as particularly difficult. Although the REPC does not see small PV-projects based on FiTs, direct marketing models to local consumers and larger free-standing PV-systems as problematic in terms of project planning and implementation, the interviewee pointed out that the ongoing EEG-debates and the situation of rapidly dropping FiTs in recent years made them hesitant to plan and invest in future PV-projects. They want to make sure that their members make a reasonable profit and that their investments are safe, as their last project was already perceived to be just profitable enough to create a very small dividend for the members. Additionally, they also do not see any opportunities for further development at the moment since the municipality has no more adequate roofs to offer or designated areas for free-standing PV-systems. Also private persons did not offer any roofs so far. It seems as if the REPC only regards freely offered roofs as an option as roof-rents in combination with low FiTs only allow for projects with an undesired profit range.

Moreover, the participant indicated in the questionnaire that their REPC is not able to realize larger projects in the next five years independently, since they see larger project as a challenge especially in terms of the necessary amount of investment capital. Additionally, the active members think they lack the necessary skills and professional background to realize large RE-projects independently and also think that they will not likely gain it in the following years. Therefore, no larger projects or project participations are planned for the near future. Accordingly, they also perceived their current management board as generally replaceable, since they are only managing existing small PV-systems at the moment and are not planning any new PV-projects until the policy situation is more clear.

With regard to the sub-variable of human capital, connection to others, case A scored quite well. Until recently the three active REPC members met once a month, but since they currently see no more economically attractive project opportunities they started meeting every two to three month only. In terms of meeting members of other REPCs, case A scored relatively low in comparison to other REPCs in the sample group with only two contacts that are met twice a year. These meetings refer to the annual and extracurricular meetings organized by the VBBW in the regional facilities of the EnBW Regional AG. The expert presentations on RE-technologies and policy developments are perceived to be interesting but not particularly useful for the REPC, since the active REPC member thinks

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<sup>151</sup> The first two audits have been paid by the EnBW AG budget left from the founding process.

that they cannot implement most of the presented technologies in their locality. The meetings with members from other REPCs are perceived to be somewhat beneficial in terms of personal utility, as personal project experiences can be exchanged. The fact that VBBW REPCs usually are more inclined to network with REPCs in close proximity to their municipality in regional network meetings (Strobel 2013) also partially explains why the REPCs has significantly lower amount of external REPC contacts in comparison to other questionnaire participants, as the community is relatively far away from municipalities with other VBBW members.

In summary, it can be stated that the SO and PO advocacy support in case A was key in the founding process, as the initial idea was brought into the community by the VBBW and EnBW Regional AG and would not have been implemented without the SO and PO support. Moreover, the information and resource provision and consultancy by the VBBW right after the founding process, in terms of schooling for roles and tasks in the management and advisory board, the member administration software is perceived to be very useful to save valuable time in the voluntary management of the REPC. In this regard it is clear that the information and resource provision of the SO also strengthened the durable collective action capacity of the REPC in terms of their organizational strength, as it helped to understand the roles and related tasks of the management and advisory board. Moreover, the member administration software makes it easier to manage the REPC and is perceived to be easily teachable by active members to potential volunteers. Moreover, consultancy provided by VBBW and EnBW Regional AG staff to get active members acquainted to the planning and implementation of small PV-projects helped to strengthen the durable collective action capacity in terms of strengthening abilities to realize small PV-projects based on FiTs. The durable collective action capacity of the REPC is nevertheless hampered by insecurities in the REPC that arose from the EEG-reform debates and rapidly dropping FiTs. A combination of their lacking skills and willingness to realize larger RE-projects with the fact that they see no project opportunities in their locality adds to this impairment, as the diversification of the energy portfolio is important for the long-term development of a REPC in terms of professionalization. Otherwise the REPC will always depend on voluntary labor by active members, which is hard to realize after a certain volume of realized projects has been reached. However, it seemed as if the interviewee did not mind this fact and that the active members seem eager to continue their collective action on a voluntary basis in the long-term. In this regard it has to be noted that the REPC has only realized a small number of projects and is therefore currently far from reaching their capacities in terms of workload and invested time. Accordingly, they have not experienced a situation yet were they reached their personal capacities in terms of voluntary work-load, which can quickly change with a growing number of projects.

### **5.3.2 Case B**

Case B represents a small to medium-sized REPC of the sample group with more than 150 members. It was founded in a small community with less than 10.000 inhabitants in 2010 and has realized its latest RE-project in 2013. The REPC has six active members that jointly plan and currently manage less than five small PV-systems on private and rented rooftops. In comparison to the other REPCs of the sample group case B scored relatively low on both the indicators for the founding process (47/80 points) and the utility of SO and PO support in the founding process (18/70). In order to understand why the REPC perceived the founding process somewhat difficult and the support of the SO and PO generally less useful, it is worth taking a closer look at the founding team of the REPC.

The initiator of the REPC has a professional background in banking and is affiliated with the municipal council related to activities in the field of RE and environmental management. The initiator got the idea to form a REPC to support the local energy transition

when reading about a REPC that became famous in the German renewables community by being one of the first REPCs to develop and implement a concept for their community together with the municipality to become 100% independent from fossil fuels in the energy sector. He presented his idea to the mayor who granted funding for interested council members and private individuals to visit RE-production sites to gather more information. After the trip, a working group of 20 locals was formed, ranging from management boards of local associations, council members etc., to develop concrete ideas for their community. Yet after a few weeks active participation dropped and a core group of six to eight active members crystalized that developed the idea to found a cooperative further. Therefore, the REPC found it difficult to find like-minded members as it turned out that although many people were interested in the concept only few were actually willing to actively engage in the necessary tasks for a successful establishment of the REPC. However, it turned out that the six members of the interest group were equipped with more than the necessary basic skills to found and manage a REPC, as they brought professional expertise ranging from bank economics, financial planning, business administration and taxing matters to general project management and environmental engineering into the REPC. The broad spectrum of professional backgrounds is important to the REPC as it also strives to become active in other RE-technologies and sustainability topics, such as environmental protection and energy efficiency. So far this activity is mainly limited to informational efforts for the latter and actively exploring new opportunities for larger RE-projects. In this regard it is interesting to note that the REPC shows attributes of a civic-ecological REPC and is thus not a purely institutional organizational REPC as conceptualized in the theoretical framework.

After it was jointly decided by the interest group to involve the VBBW and the EnBW, the VBBW provided the interest group with information and resources, including general information on REPCs, sample business plans for PV-projects based on FiTs and sample code of conducts that have been used and amended according to their other goals. Moreover, they provided three consultancy meetings with VBBW and EnBW Regional AG staff, in which advice on formulating the code of conduct and the business case for the first project was given. However, it is interesting to note that the REPC indicated in the questionnaire that the support from the SO and PO in the founding process was only useful for the organization and promotion of the founding event. The interviewee clarified that the provision of information and resources was mainly useful in terms of time saving, as only three members of the interest group conducted the majority of tasks in the founding process. The tasks themselves were mainly perceived to be somewhat difficult to very easy, but it was pointed out that with the provided information and resources the interest group was spared from collecting the necessary information on their own. The support for promoting the founding event was perceived to be very useful, as the SO and PO provided the REPC with services free of charge such as designing and producing informational flyers for the event and running ads in local newspapers. Support of the VBBW and the EnBW Regional AG through staff in organizing and hosting the founding event was also perceived as useful, as it helped to make sure that the process was conducted according to the legal protocol.

In comparison to the VBBW and the EnBW Regional AG, the municipality and the CAA played a less significant role in the founding process. The support from the municipality consisted more of an idealistic support rather than hands on support for the REPC. Although the initiator is affiliated with the municipality, the initiation of the founding process itself was independently organized. The municipality also did not provide municipal roofs or a functional room for the founding event for free, as evident in case A. Most of the communal rooftops could not be used due to their architecture so the REPC started with projects on rented private roofs. Later a larger municipally owned roof became available for a project above 100 kWp and the REPC got roof-rent reductions from the municipality, however, it

was not for free. Nevertheless, the mayor supported the REPC by writing a welcome address in the informational flyer of the REPC to advertise the idea in the community and show that the REPC is a project for the whole community as the municipality is also a member of the REPC. Therefore, the mayor was also elected into the advisory board as a representative of the municipality. It is perceived by the participant that the involvement of the municipality helped in gaining potential members, as they made the whole idea more 'official', which helped to create trust for the REPC among the local citizens.

The CAA on the other hand was not perceived to be very helpful, due to the fact that the CAA made a mistake in the audit<sup>152</sup>, so that the registration of the REPC took a few months and the first projects had to be put on hold. In the interview it seemed as if the dealings with the CAA were regarded as a formality rather than help as the interviewee indicated that they hypothetically would not have needed the CAA, especially since they received support from the VBBW and EnBW Regional AG. However, they took one seminar during their registration period at their CAA for new managements and advisory board members, during which they received information and tips on the internal organization of tasks and meetings. This was considered useful in terms of strengthening the internal organization. It was paid for with the budget of the EnBW Regional AG. The interviewee pointed out that the CAA seminars are hard to compare to the (shorter?) afternoon seminars of the VBBW on the management and advisory board, in terms of scope and depth of the information provided. Nevertheless, further seminars are not seen as an option due to the costs for the seminars and the low profits of the REPC.

After the founding process was finished, the VBBW and EnBW Regional AG support continued, and it is interesting to analyse its effect on the durable collective action capacity of this REPC. Right after the founding event the REPC received further support by the VBBW and the EnBW Regional AG through the provision of the aforementioned member administration software and a connected schooling to teach how to make use of it. Moreover, the REPC participated in regional network meetings that are organized by the VBBW. Both forms of support are seen as very useful for the active members of the REPC as the administration software saves valuable time, while the network meetings facilitate the exchange of information and experience with other active REPCs in the region. The REPC meets three times a year with ten members of other REPCs in regional VBBW meetings. Although the participant did find the expert presentations on RE-technologies informative, they were not perceived as particularly useful for the REPC since the presentations had a stronger focus on technological aspects rather than the implementation of projects. The information due to exchange with other VBBW REPCs is valued higher in terms of utility for specific problems, i.e. insurance contracts etc., and therefore the VBBW is seen as a useful connector. Moreover, the information provision on recent policy developments in the tri-annual meetings and newsletters is seen as useful for the REPC, to assess opportunities for potential projects.

Although the REPC conducted the tasks in the founding process mainly independently, they indicated in the questionnaire that they are not sure about their management capacity regarding small FiT and direct marketing based PV-systems, and also do not think that their REPC is able to realize a large PV-system above 1 MW independently in the next five years. Keeping the professional backgrounds of the members in mind, the response in the questionnaire seems rather odd but is similar to the reasons mentioned in case A and can be explained as follows. Due to the currently low FiTs, their main business model with rented roofs is not economically realizable anymore. Their last project was based on a business case for directly marketing the electricity to a consumer in close proximity, however, this concept is perceived to be really time-consuming due to the bureaucratic

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<sup>152</sup> It has to be noted that this is quite unusual, but likely due to the lack of experience with REPCs that the CAA had at this point in time.

workload. Therefore, the REPC delegated the management of the system to a local electric service provider that takes care of the technical and bureaucratic issues. This in turn only allowed for a very small dividend for their members as the company is paid for their services. Accordingly, the REPC also does not see free standing PV-systems as a viable option for a project at the moment, as the bureaucratic hurdles are even higher. Generally, direct marketing models related to small and large PV-systems are not seen as an attractive investment opportunity at the moment, especially due to the clause in the reform plans of the EEG that makes it mandatory to market the electricity to the spot-market from 2017 on.

However, it is interesting to note that although the REPC does not agree at all that they are able to realize larger RE-projects independently in the next five years, the REPC is exploring opportunities to realize an own large RE-project through direct citizen participation models where they are considering to delegate the technical administration of the system to a local private company again. Although the REPC perceives this to be connected to a lot of additional work in terms of planning, the active members still think that they have the necessary capacities in terms of time as they are currently only managing a small number of PV-projects. The REPC prefers direct citizen participation models where they can eventually take over the majority of the shares of the project company, therefore the offers proposed by BürgerEnergie AG through the VBBW are no options the REPC wants to consider. Alternatively, they can imagine collaborating with another REPC in the region that has experience to realize larger RE-projects. Altogether the REPC seems to possess a relatively high durable collective action capacity, which is currently only hampered in terms of realizing PV-projects by recent policy developments. However, they seem to be eager to stay actively engaged in finding and realizing new RE-options to diversify their REPC, which is also reflected in their meeting frequency. The six active members meet once a month to discuss current topics and events as well as concrete options for a new large RE-project that is starting to take shape. The meetings are perceived to be very important by the active members, even when there are no urgent topics or issues to discuss, since they create cohesion in the group and foster the motivation of the active members to stay engaged in the further development of the REPC. The REPC has also institutionalized formal internal rules of procedure that help to keep track of roles and related responsibilities.

In summary, it can be stated that the provision of information and resources by the SO and PO in case B was the most important form of support. Especially the founding documents and samples were perceived to be very useful in terms of time saving. Moreover, the financial support through the provision of a €10.000 budget was seen as very useful as it could be used to cover all the expenses in the founding process and moreover for financing a seminar at the CAA to foster the organizational strength of the REPC. Also the provision of advocacy support in terms of PR-support was considered helpful for the interest group to promote the founding event. However, it is important to keep in mind that the active members were the main drivers of the founding process and formed an interest group with diverse professional backgrounds that was able to cover all the necessary disciplines that are important to establish and manage a REPC, i.e. investments, marketing and presentation of the cooperative, legal issues, financing, and public relations. The interviewee was convinced that the REPC would have also been founded without the VBBW and the EnBW Regional AG support, with the difference that the founding process just would have taken longer.

Moreover, the ongoing support of resource and information provision, i.e. the member administration software and the connected schooling, are regarded as useful tools to save time and to reduce the workload. The ongoing support of the VBBW in terms of networking and alliance-building through regional meetings is especially seen as useful for exchanging information on concrete problems and ideas with members from other REPCs. Generally, the REPC seems to possess a high durable collective action capacity that is reflected in and nurtured by frequent meetings of the active members and frequent

meetings with a relatively high number of active members from other REPCs. In the context that their old business model is currently not implementable due to insecurities in the investment climate, their willingness to independently explore and seize other opportunities to realize local RE-projects can be interpreted as another indicator for their management capacity and thus their durable collective action capacity. However, the REPC does not want to be involved in the management and technical administration of a large RE-project, due to lacking skills and time constraints and wants to take advantage of services provided by a strategic partner. Yet it is important to note that the REPC wants to be able to buy the majority of shares of a company that owns and operates the large-RE project to be able to stay in control of the company. Participations in wind farm projects offered by BürgerEnergie AG are therefore not seen as desirable forms of support to invest in larger RE-projects, as they exclude the possibility of majority ownership and so far do not offer projects that are in direct proximity of the municipality.

### **5.3.3 Case C**

Case C represents a small socio-political REPC of the control group with less than 100 members that was founded in 2010 in a small community with more than 15.000 inhabitants. It realized their last RE-project in 2014. The REPC has nine active members that jointly planned and currently manage less than five small PV-systems on private roofs and one larger free-standing PV-system independently. The goal of the REPC in the medium-term is to invest parts of its profits in international and/or local charitable projects and can also imagine to invest in RE-projects outside of their region. Therefore, it is also planned to professionalize the REPC in the long-run by paying the management board for their invested work hours, so that the further growth of the REPC in terms of RE-project volume is ensured.

As the REPC scored among the highest in the control group (63/80 points) regarding the level of difficulty of the founding process, it is useful to take a closer look into the founding process and into the founding team of the REPC. The initiator of the REPC has a professional background in public relations and is active for a local church community. The idea to establish a REPC was further developed after the initiator made contact to a local PV-project developer through jointly working in a municipal working group on local environmental projects. Both the initiator and the PV-project developer were the key drivers of the founding process and are still the most active members in terms of project acquisition, realization and management. While the initiator is mainly involved in project acquisition and networking, the PV-project developer has in depth-knowledge on project-related contracts, insurances roof-renting etc. and is also able to implement and manage larger projects. The recruitment of like-minded and skilled members proved to be fairly easy due to available connections in the church community and due to personal connections of the PV-project developer. The nine interest group members have various professional backgrounds that enabled them to cover all the necessary disciplines and related tasks in the founding process. Moreover, the relatively large amount of active members enabled them to reduce the individual workload and to evenly spread the related tasks in the different phases of the founding process between the interest group. Additionally, they used publicly accessible meeting protocols in order to keep track of responsibilities to facilitate exchange between the interest group when tasks were partially overlapping. This tool is used to date to organize the tasks between the active members and is seen as useful instrument for the REPC to organize their collective action.

While the business case, the business plan for the first projects and the promotion of the founding event were developed and conducted independently, the formulation of the code of conduct and the founding event were supported by the regional CAA. On request they provided the interest group with information and resources through the DGRV-CD (DGRV 2009), including sample code of conducts, all the relevant founding documents, and

advocacy support in two personal consultancy meetings to adjust the code of conduct. Moreover, they provided the interest group with staff to host the founding event, which was perceived to be very useful to make sure that it was held according to legal protocol. Generally the support from the regional CAA was perceived to have been very useful, especially in the registration process of the REPC. Due to amendments of the EEG during the founding process in 2012, the planning of PV-projects and the official registration of the REPC had to be put on hold. Here the CAA supported the interest group by advising them to start with a special legal construct that allowed them to found a pre-cooperative (Genossenschaft in Gründung), protecting the initiators from possible liabilities in case the project could not have been realized for whatever reasons. After the policy situation was stable again the planning could be resumed and the REPC was officially registered a few month later. Additionally, the audits by the CAA are seen as a useful form of support in terms of having an additional backup on the bookkeeping, while other offers, i.e. schoolings and seminars are seen as less useful since the active REPC members do not think that they need them due to the available knowledge in their REPC. The municipality on the other hand was not involved in the founding process and is also not a member of the REPC. Currently the municipality is only idealistically supporting the REPC by laying out the informational material in the community centre and by advertising the REPC in public events. Former negotiations with the municipality about municipal rooftops were stopped after it became clear that both sides' expectations regarding the respective profit of the project were too divergent, i.e. the municipality wanted a higher roof rent than the REPC was willing to pay.

The REPC generally scored very well on the indicators for durable collective action capacity. With regard to human capital, first the management capacity is analyzed. In terms of management capacity it is clear that the REPC has a strong advantage due to the PV-project developer that is able to plan, implement and manage small to very large PV-projects based on FiTs, direct marketing in close proximity or direct marketing to the spot-market. This is also reflected in the answers of the questionnaire regarding the human capital of the REPC, where the REPC scored 29 out of 34 possible points. Moreover, other active members can compliment the project planning with insights on legal and taxing matters. Although the REPC is not able to realize other large RE-projects independently as they lack the necessary expertise and skills, the REPC is willing to start other large RE-projects, and is eager to first find contacts that are willing to actively and voluntarily participate. Currently a contact has been made through the initiator that agreed to support the REPC by conducting a cost-effectiveness analysis for a capital intensive RE-project. Depending on how favourable the conditions are for the REPC, collaboration with other REPCs and/or a project development company on a project through a direct citizen participation model is also considered an option.

Regarding the organizational strength, the REPC is sure that the management board could be replaced in the short-term with the same quality, as the REPC is fortunate enough to have active members that go beyond the management and advisory board. However, the interviewee pointed out that it would be more difficult to replace the initiator and the project manager, in terms of networking expertise and project realization. Additionally, the REPC has an interesting meeting structure that was implemented after some mistakes have been made after the founding process. Due to the satisfaction with their initial success of realizing the first projects, the REPC underwent a phase of four months, during which active members did not frequently meet. When suddenly an interesting project opportunity occurred, the active members were not well prepared and not able to conduct the necessary tasks to raise the required funding for the project in time (before the FiTs were lowered again). This made it impossible to realize the project economically profitable. Therefore, the REPC started open meetings once a month with nine active members, including six members of the management and advisory board, where also other interested individuals and

members can participate. Here information on current developments, problems and opportunities for new RE-projects are discussed and tasks are delegated when necessary. This open meeting structure is meant to attract potential members and engage volunteers into activities. Accordingly, volunteers can get involved in small tasks on demand, e.g. serving in informational booths at local and regional fairs, taking over tasks in organizing and promoting informational events. The open meeting structure has so far received positive resonance in the community and also by individuals that are willing to actively support the REPC. However, the REPC only meets one member of another REPC two times a year. These meetings take place more for practical reasons, as the REPC is in close proximity to municipality in which case C operates. They are mainly meant to not step on each other's toes in terms of project competition and to keep the option for future collaboration on a large RE-project open.

In summary, it can be stated that the conducting of the necessary tasks in the founding process was perceived to be rather easy, as the REPC was well organized and could rely on a relatively large number of skilled, like-minded and highly motivated members that spread the workload evenly among each other, with the exemption of PV-project acquisition, planning and implementation that were and still are conducted by the initiator and the PV-project developer. Accordingly, almost all tasks in the founding process could be undertaken independently. The lack of expertise regarding the cooperative legal structure was compensated by the support of the regional CAA that provided the REPC with general information, sample code of conducts as well as related consultancy meetings, necessary documents for the founding process and staff to host the founding event. All measures were perceived to be useful for the founding of the REPC. Due to their professional backgrounds, their efficient internal organization and highly motivated active members it can be stated that the REPC also possesses a high durable collective action capacity. This is reflected in and fostered by the unique open and transparent meeting structure that was set up to attract potential members and, moreover, is useful to engage interested individuals that are willing to actively support the REPC through small tasks. It not only helps to increase the flexibility and durability of the organization but also to stay alert when new RE-project opportunities arise, thus strengthening the management capacity. Additionally, the REPC is engaged in establishing new contacts to diversify their energy portfolio and just recently realized a large free-standing PV-system independently through the PV-project developer, which also reflects their management capacities as dropping FiTs and bureaucratic hurdles regarding direct marketing of PV-electricity that other REPCs perceive as too high, did not seem to affect the realization of the new project.

### **5.3.3 Case D**

Case D represents a small civic-ecological REPC of the control group cases with less than 100 members that was founded in a small community with more than 15.000 inhabitants in 2010. It realized their last RE-project in 2013. The REPC has four active members that jointly planned and currently manage less than 10 small FiT-based PV-systems on municipal rooftops independently.

In comparison to the other REPC in the sample group, case D belongs to the cases with slight difficulties in the founding process (55/80 points). In order to find out why the REPC perceived the founding process more difficult than other participants in the control group, it is useful to take a closer look into the founding process of case D. The initial idea to provide municipal rooftops free-of-charge to install PV-systems to a local initiative came from the municipal council. The idea to establish a REPC to plan and manage the PV-projects was, however, developed by a local and informal energy grass-roots initiative that meets once a month and informs the community about energy producing and saving measures (e.g. LED-lighting in households or street lamps, geothermal power and local district



heating). Since they have personal connections to the mayor the idea was presented to and welcomed by the city council. Although the municipality is also a member of the REPC, the interest group, consisting of members of the grass-root initiative and interested citizens, organized the founding process independently. While the recruitment of like-minded members proved to be manageable, the recruitment of skilled-members was perceived to be difficult, as the interest group could not find a volunteer with a professional background in business administration and accounting in the founding process. However, this was not perceived to pose a big problem, as FiTs were still high and profits could be estimated more easily at the time when the PV-systems were planned installed. Therefore, the interest group did not find it very difficult to work them into planning and installing PV-systems based on FiTs in the orientation phase and to spread the workload and connected tasks evenly among the active members.

In the planning phase the code of conduct was formulated on the basis of the GenG 2006 and code of conducts that have been requested from other REPCs in the federal state. The code of conduct, the business case for the first project and the organization of the founding event have been realized independently and were perceived to be generally easy. As the first projects were installed on municipal roofs, the interest group did not find it difficult to select an appropriate site, work out user contracts with roof owners and to decide on insurance for the project. However, they perceived the working out of contracts with an independent auditor and the generation of external capital as difficult due to their lack of skills and knowledge regarding business administration and financial planning.

For the founding event itself, case D received advocacy support from the regional CAA through the provision of staff that hosted the event. However, besides the provision of staff for the founding event the regional CAA was not considered really useful, as the active members gathered the necessary information and founding documents independently and did not request consultancy meetings from the CAA. The overall impression of comments regarding the CAA made by the interviewee indicated that the CAA and its audits are more perceived as a bureaucratic hurdle than useful support and have only been useful until the REPC found a volunteer for the management board with a professional background in business administration and accounting a few month after the founding event.

The REPC also scored low on its durable collective action capacity. In order to see why the REPC scored relatively low regarding their available human capital (22/35 points), it is useful to take a closer look into the answers of the questionnaire participant and fill them with context gathered from the interview partner. The below average results were especially surprising since the REPC scored relatively well regarding the indicators for the variable connection to others. Since the group of active members is relatively small and is also connected on a personal level, they meet five times a month in informal meetings that not always have a specific purpose and where ideas and REPC-related issues can be discussed. Every second month, meetings of the management and advisory board are held where open questions and task are jointly worked off, including project ideas. The frequent meetings are perceived to be very important to keep everyone alert and to develop the REPC further.

Soon after the volunteer was found that also had experience with small PV-projects through privately realized installations, the REPC realized the majority of projects in 2011 with more than five small PV-projects on municipal roofs. However, due to the drops in FiTs and the investment insecurities that arose due to the EEG-debates and reform plans between 2011 and today, the REPC does not see FiT-based projects as future options for investment. Therefore, it was indicated in the questionnaire that they were not sure about their management capacity to realize projects based on FiTs. Since the government announced plans in 2013 to charge direct marketing to consumers in close proximity by adding the EEG-levy to the sales price, this business model is also not seen as a safe option. It would render the projects economically unattractive for the REPC. However, the active

members perceive to be capable of jointly planning a large free-standing PV-system based on direct marketing to consumers in close proximity with a project partner organization, under the conditions that the management and technical planning of the project could be delegated to the project partner and that the municipality would designate an open space free-of-charge for the project development.

However, this option has not been further explored yet, since the REPC is planning to invest in local or regional wind energy projects. With almost ten small PV-projects the active members perceive to have reached their personal capacities in terms of voluntarily managing PV-projects. Therefore, they are planning to invest in large regional projects, where a strategic PO provides a direct citizen participation model and takes care of the management and administration of the project. Together with other REPCs and around 20 municipalities in the region, the REPC founded a RE-project development cooperative in 2013 as part of the regional administrative districts strategy to become fossil fuel free until 2030. All participating municipalities and the REPCs are represented in the advisory board, while a representative of the municipalities and a representative of the REPCs manage the cooperative. Both representatives have the basic skills and knowledge for larger RE-projects due to their professional backgrounds. The purpose of project development cooperative is to plan, realize and manage large regional RE-projects through direct citizen participation models for their members, together with regional POs that assist in the project planning and implementation, e.g. electrical installation company or a RE-project developing company. The development cooperative is sought to enable members of local REPCs to jointly invest in and own large regional RE-projects, without having to invest time in the management of the project, as it goes beyond the abilities, and in case D the personal capacities, that are currently available in most participating REPCs. The impairment of the REPCs management capacities due to the insecure investment climate and personal capacities is thus being compensated by their engagement with the project development cooperative, as it not only enables them to diversify their RE-portfolio but also to directly participate in the decision-making on RE-project options.

However, it became clear that the REPC is impaired in their organizational strength as the results of the questionnaire showed. Although they have a high level of understanding regarding the roles and tasks in their REPC, the active members perceive it as difficult to replace the management board in the short term and with the same quality due to the relatively small number of active members and frequent meetings. The main problem is that they have only one member that has the business administrative and accounting skills and thereby the knowledge to effectively manage the financial matters of the REPC. Additionally, this member is in retirement and does not want to actively participate in the long-run. They are hence soon in need for someone with the necessary skills that is willing to take over this task voluntarily. While the task has already proven not to be easy in the past, as indicated by the interviewee, plans for replacement have not yet been made.

In summary, it can be stated that the REPC was able to independently organize and implement the founding process but they perceived the first audit and the hosting of the founding event as very useful. The ability to independently collect all the necessary information and legal documents to found a REPC as well as the recruitment of like-minded members were facilitated by the fact that parts of the interest group are involved in a local and informal energy grass-roots initiative. However, it proved to be difficult to recruit an active member that was qualified enough to manage the financial matters. This, in turn, also led to difficulties in collecting external capital and in working out a contract with an independent auditor for the first PV-project. The realization of the first PV-project and also following PV-projects was nevertheless facilitated by the free provision of municipal rooftops and attractive FiTs at the time when the PV-projects have been realized. After the volunteer with the necessary professional background was found, the REPC quickly realized

an unusually large amount of projects for a small REPC within a year until the policy debates made them hesitant to make further investments. The debates thereby impaired their management capacity in terms of independently realizing PV-projects based on FiTs. The last FiT-based PV-project in 2013 would not have been profitable without the free roof provision of the municipality. Moreover, the active members perceive to have reached their personal capacities in terms of work and time that they are willing to invest voluntarily, which adds an additional impairment to their management capacity. However, the REPC proved to be able and willing to continue their collective action by compensating their lack of time and skills regarding the independent realization of small or large PV-projects based on direct marketing models and other large RE-projects, by forming a participation vehicle in form of a RE-project developing cooperative through collaborating with other REPCs and municipalities in the region. The frequent meetings with the active members, their personal connections to each other and the joint work on management issues together with the advisory board, further foster the durable collective action capacity of the REPC by motivating volunteers to stay engaged and to explore new opportunities, while spreading and sharing the workload. Nevertheless, the REPC has a low organizational strength due to the small number of active members that both are willing and have the skills to take care of the financial matters of the REPC. This circumstance is worsened by the fact that the only member that brings the necessary professional experience is already in retirement and is not planning to stay involved in the mid- to long-term.

#### *5.4 Summary of the results*

In the following, the results of the research will be summarized in two sections. The first section summarizes the results in terms of forms of assistance provided by SOs and POs and its influence on the founding process. The second section contains the integrated results on the durable collective action capacity of a REPC. Here the relevant forms of support in the founding process will be summarized followed by the forms of ongoing support that have been provided by the VBBW and EnBW Regional AG.

##### **5.4.1 Relevant forms of SO and PO support in the founding process**

As shown in the analysis of the obtained data and the respective cases, SO and PO support is very useful for interest groups in the founding process, especially in the planning phase and the founding phase of the founding process. The forms of support with the highest utility in the planning phase seem to be the financial support that has been provided by the PO, and the provision of information and resources, advocacy support and networking and alliance-building support provided by the SO. The financial support in form of the unconditional €10.000 budget is useful to take potential financial risks off of active members, since they do not have to cover the costs occurring in the founding process on private expenses until the REPC is officially registered. Moreover, it can additionally be used after the founding process for financing other undertakings that are perceived to be beneficial for the active members, as in case B where the budget was also used to pay for an apprenticeship on cooperative organization offered by their regional CAA.

In terms of information and resource provision in the planning phase, especially the provision of all the founding documents and sample code of conducts is very useful as it helps active members to avoid time consuming research to formulate a legally sound code of conduct and to gather and work out the necessary legal documents for the founding event. This is also reflected in case C, where the REPC received the same support in terms of information and research provision from their regional CAA. As case D shows, REPCs that do not receive this support can also obtain the necessary information but only with a greater effort. Additionally, the advocacy support in form of personal consultancy meetings to

prepare the necessary documents for the founding process is useful for an interest group.

However, the utility of the mentioned provision of information and resources and advocacy support depends on the previous knowledge of the interest group, as shown in cases B and C. Both received this form of support from a SO, but also had a larger number of motivated and skilled members in comparison to case A and case D. Based on the answers of the interviewee it is likely that case D would also have perceived these forms of support more useful, if they would have been available at the time when the REPC was founded. Therefore, it can be concluded that the less previous knowledge on RE-projects and cooperative organization is available in the interest group, the more useful are the provision of information and advocacy support by a SO or a PO<sup>153</sup>.

As opposed to the most regional CAAs, the founding concept of the VBBW and EnBW Regional AG also includes advocacy support in terms of promoting the founding event, by providing REPCs with services free-of-charge. This includes designing and producing informational flyers for the event and running ads in local newspapers. This form of support is very useful for REPCs as it helps them to reach many potential members in the community and relieves the interest group in terms of time, money and effort to invest in promoting the founding event. Regarding the founding phase, the advocacy support of the SO in form of staff provision for the founding event is very useful for REPCs, as it helps REPCs to make sure that the founding event is held according to legal protocol. This is reflected in all four cases that have been interviewed, as every case received this form of assistance either by the VBBW or by their regional CAA and perceived it to be very useful, independent from their overall perceived utility of the respective SO.

The support of the VBBW and the EnBW was also useful in terms of alliance-building and networking with public representatives. The sample group REPCs that participated in the questionnaire received more substantial support than the control group participants in terms of having been provided with municipal roofs free-of-charge or for a low rent. As this model is also an essential part of the SO's and PO's founding concept, most of the first PV-projects of the sample group REPCs have been realized on municipal rooftops. While it does not become entirely clear if all municipal rooftops were provided free-of-charge or for a low rent, the questionnaire results imply that this is likely the case for most VBBW REPCs. Moreover, all municipalities in which VBBW REPCs have been founded also became members of the REPC and are usually represented through a public representative in the advisory board. This is perceived to be useful in terms of local connectedness and legitimacy, as the involvement of public representatives is meant to show the community members that the REPC is also supported by the municipality.

However, the VBBW and EnBW Regional AG also offer to organize the whole founding process on request of municipal representatives. This form of support is very useful for communities that lack individual drivers or promoters for the idea to establish a REPC as case A revealed. The REPC in case A would not have been founded without the initiative of the SO and PO. Volunteers for the management board were only recruited in the founding event and worked into their roles and tasks by the staff from the VBBW and EnBW AG in consultancy meetings during the registration period of the REPC. This shows that SOs and POs can potentially initiate collective action in the context of establishing a REPC to jointly produce RE, but it could neither be confirmed nor excluded that the collective action undertaken by the active members is also durable in terms of further project realizations, as it was unfortunately not possible to find out how many REPCs of the sample group were actually initiated by the SO and PO, due to the low response rate of the questionnaire and

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<sup>153</sup> Although it was not evident in the four analyzed cases, it has to be kept in mind that the EnBW Regional AG also provides staff for the VBBW to work the interest group into the planning and implementation of FiT-based PV-systems, depending on the demands of the interest group in the founding process.

the unavailability of publicly accessible information. It can be assumed that at least one REPC of the sample group survey participants was also initiated by the SO and PO, since they scored quite similar regarding the level of perceived difficulty and utility of the SO and PO support to conduct the necessary tasks the founding process. Interestingly, this other case did not realize a project since 2011. On specific request, the interviewee of case A, that has been initiated by the SO and PO, could also not name an exact number but he pointed out that several REPCs that have been founded between 2008 and 2010 were initiated by the VBBW and EnBW Regional AG.

#### **5.4.2 Relevant forms of SO and PO support to foster the durable collective action capacity of a REPC**

As shown in the analysis of the obtained data and the respective cases, ongoing SO and PO support is very useful for REPCs in fostering organizational strength, management capacity and the connection to members of other REPCs. The forms with the highest utility for fostering the organizational strength and management capacity of REPCs seem to be the provision of information and resources as well as alliance and network-building support provided by the SO and PO.

In terms of information and resource provision, especially the member administration software provided by the PO and the connected schooling provided by the SO can be considered as very useful for REPCs. It significantly reduces the time and effort that the management board has to invest in the annual statements, distribution of member dividends and taxing matters. Accordingly, this form of support is strengthening the general management capacity by leaving more room to concentrate on identifying, planning and realizing new project opportunities. As the use of the software is not difficult to learn, new management board members can be easily taught within a short time frame to manage existing projects of the REPC. Therefore, this form of support also fosters the organizational strength of the REPC, in terms of general replaceability of the management board. However, it can only ensure that members can quickly be replaced in the same quality in terms of managing existing projects and not in terms of their ability to realize new projects. Additionally, the provision of information regarding the roles and tasks of the management and advisory board in seminars offered by SOs is very useful in terms of fostering the organizational strength, which is reflected in cases A and B. Although it has to be noted that the support provided by the CAAs in Germany, in terms of offering seminars specifically for the management and advisory board members for their member REPCs, is perceived to be more useful as they go into further detail than the seminar offered free-of-charge by the VBBW, which is more viewed as an introductory lesson. However, the seminars by the CAAs are not offered free-of-charge and due to the relatively high prices the respective utility for one's REPC has to be thoroughly considered based on the respective needs of the active members.

It generally became clear in the analysis of the four cases that the management capacity in terms of the abilities of REPCs to realize different PV-business models, larger PV-projects and other large RE-systems strongly depends on the active members skills, knowledge and personal work capacity and the ability to adopt to the changes in support policy that have been introduced with the EEG-amendments in 2012. Especially the new policy situation coupled with further EEG-reform debates is currently impairing the management capacity of REPCs to continue their collective action regarding small to medium PV-projects. Most REPCs only have experience with FiT-based business models and are hesitant to realize direct marketing business models due to the insecurities that arose from the ongoing EEG-debate and the proposed amendments. This is indicated by all cases but case C, which has the advantage to have a PV-project developer as an active member in the REPC. The amendments in the EEG and the policy debate seem to have especially

affected the durable collective action capacity in terms of realizing small PV projects for REPCs that were solely focused on realizing small PV-projects on municipal or private rooftops that are offered for free, as reflected in case A and D. This may offer a possible explanation of why 40% of the sample group and only 20% of the control group REPCs have been inactive after 2011. Accordingly, the realization of PV-projects based on FiTs and free municipal rooftops poses a central part of the VBBW and EnBW Regional AG founding concept and is also reflected in the comparatively high provision of free municipal rooftops for the sample group REPCs that participated in the survey in comparison to the control group REPCs that answered the questionnaire. It is likely that most inactive sample group REPCs did not perceive FiT-based PV-projects after 2011 as economically attractive, as the profit range of projects with the introduction of the EEG 2012 consistently dropped in comparison to projects realized before 1<sup>st</sup> April 2012.

Nevertheless, all but case A were able to adapt in their own ways to the policy situation after the EEG 2012 came into effect. While case A currently sees no options that meet the profit and investment security expectations of the REPC to continue their collective action in terms of realizing small PV-projects until after the policy situation is cleared up, case B compensated for their lacking management capacity to realize and manage PV-projects based on direct marketing models. It did so by realizing a direct marketing PV-business model in collaboration with a local electrical service company that also takes care of the bureaucratic and technical management of the system for a fixed fee. Case D compensated for their lacking skills and knowledge to realize direct citizen participation RE-projects through collaboration with other regional REPCs and municipalities by jointly forming an investment vehicle in the form of a RE-project development cooperative to plan and realize large regional RE-projects where the majority of shares is owned by REPCs in proximity to the project. Similarly, case B and C explore further options to realize larger projects on their own or with POs to adapt to the policy situation and to diversify their RE-portfolio. Here it is interesting to note that all three cases and the majority of REPCs in the sample and control group that have been planning large RE-projects between 2012 and 2014 are deliberately planning projects with other regional REPC or regional PO participation. The respective local REPCs can hereby buy the majority of the project company that manages the RE-project in order to keep the largest part of the profits in the region and to be independent in their choice of investment partners. In this regard it becomes clear why the investment vehicle provided for the VBBW REPCs through the BürgerEnergie AG is not a useful option for a majority of REPCs that are primarily interested in realizing large projects through direct citizen participation models.

However, the provision of network and alliance-building support that is offered by the VBBW to its members through the annual general assemblies and the regional network meetings can be considered as very useful for member REPCs in terms of meeting a larger number of members from other REPCs on a frequent basis, as the questionnaire results revealed for the sample group. This can in turn potentially facilitate networking among VBBW REPCs in the same region and allow for more opportunities of knowledge exchange, which is also reflected in case B. Case B received the necessary information on realizing a PV-business model based on direct marketing to consumers in close proximity from other member REPCs of the VBBW through one of the regional network meetings. However, it can be considered less useful for REPCs that are located in remote areas such as case A. Case A has only two other REPCs in their proximity that meet in the regional network meetings of the VBBW. The amount and frequency of internal contacts to active members, on the other hand, seemed to depend more on the respective meeting structure that the REPCs used. No SO or PO support was established in, for instance, providing information of feasible and effective meeting structures. While active members in case A and D only meet with respectively three and four members with varying contact frequency due to personal

relations of active members in case D, case B meets with six members every month. However, the contacts to active members in all three cases include mainly contacts in-between the management board, while the advisory board meets on a less frequent basis. In contrast, case C showed an unusually high number of active members that meet once a month with around eleven contacts, which can be attributed to their open and transparent meeting structure that also allows for non-members and willing volunteers to actively participate in the meetings.

Regarding the fostering of intrinsic and extrinsic motivation, no forms of support could be identified that either foster or hamper one or the other. Moreover, all survey participants scored fairly similar on intrinsic and extrinsic motivation since almost all participants are part of the active sample and control group, which did also not allow for comparison with the level of intrinsic and extrinsic motivation of inactive REPCs.

## 6. Discussion

This research has provided a comprehensive account of SO and PO support and general support demands in the founding process and for the durable collective action capacity of REPCs. In order to do so it has started from the assertion that SO and PO support as well as the founding process and the durable collective capacity of REPCs can be conceptualized and relationships between them can be hypothesized. In this the research was considerably exploratory and aimed to provide new knowledge on REPC support in terms of its influence and how it could be enhanced. The following sections reflect upon the contribution, validity and limitation of this research and then move on to give recommendations for further research.

### *6.1 Contribution of this research*

This research provided several contributions to science and practice, which are outlined consecutively. In general, this research contributed to the community energy literature by providing practical insights on the utility of specific forms of support provided by intermediary organizations, i.e. SOs and POs in the context of REPCs, to foster the founding process and the durable collective action capacity of a specific direct citizen participation model, i.e. the REPC. As opposed to Hargreaves et al. (2013), who had a much broader focus and researched the forms of support provided by intermediaries for different types of RE-grassroots initiatives subsumed under the label community energy, this research has a much narrower focus on intermediaries in the specific context of REPCs. This narrow focus allows for drawing general conclusions on the utility of forms of support provided by specific SOs and POs in the context of REPCs and thus also for general recommendations for interest groups that want to form a REPC, existing REPCs and municipal representatives, on what forms of support have the highest utility for establishing a REPC and to foster the durable collective action capacity of REPCs.

The theoretical framework that defines SOs and POs and their forms of support provides a conceptualization of the founding process and the durable collective action capacity, contributes to the thus far very sparse scientific literature on this topic. The framework may fulfil several functions. Most prominently, it can be applied to similar assessments in other contexts and it aids to derive recommendations for SO and PO support. The framework proved to be useful to identify the specific SOs and POs and to categorize their forms of support. Additionally, the labelling of a REPC as a collective action organization made it not only possible to define the fulfilment of necessary tasks in the founding process as collective action goals to be able to measure the level of difficulty to establish the REPC, but also to assess the collective action capacity of REPCs, by drawing on indicators provided by the collective action literature. As the theoretical framework was deliberately constructed to also be applicable in other but similar national and legal contexts, i.e. EU member states, it can also be used to identify and assess the utility of forms of support provided by SOs and POs to REPCs in other national contexts. However, it has to be noted that the indicators perceived management capacity to realize FiT-based projects and direct marketing models likely need to be adapted to the respective national context of RE-support and energy market laws.

The theoretical framework is also useful to identify different types of REPCs based on their goals and deliberate involvement of a SO or PO in the founding process. However, case B showed that the labelling of all VBBW members as institutional-organizational REPCs is somewhat flawed. It can be assumed that a good part of VBBW REPCs cannot be labelled as institutional-organizational REPCs, although they all have close ties to the municipality and a PO and SO was more or less actively involved in their founding process. Case B revealed the possibility that many VBBW REPCs, where a local interest group mainly drove



the founding process, in fact can be labelled as civic-ecological REPCs that used the VBBW and EnBW Regional AG support as a vehicle to establish the REPC according to their specific goals. Due to the fact that unlike institutional-organizational REPCs that have been founded by a local VR-banks, where VR-bank staff in most cases takes over the management of the REPC, VBBW REPCs have a much more informal connection to the EnBW Regional AG. Although a few active members in local REPCs have direct professional connections to EnBW Regional AG as employees, the provision of staff for the management board is not an official part of the VBBW and EnBW Regional AG founding concept. Therefore, it would be useful to confine the label institutional-organizational REPC to REPCs where staff members of the PO are deliberately voted into the management board and/or advisory board as a direct connection to the PO.

Moreover, the integration of Holstenkamp and Degenhardt's (2013) conceptualization of citizen participation models in the theoretical approach helps to distinguish between different types of community energy on the basis of ownership and decision-making rights of citizens in the RE-project or project company, that live in proximity to the RE-projects. The distinction of direct and indirect citizen participation models is also useful to assess the utility of SO and PO support for REPCs in realizing large RE-projects, as it became clear in the research that direct citizen participation models for large projects are generally preferred by REPCs, regardless of their respective management capacity to realize and manage large RE-projects independently.

The indicators 'type of latest planned and realized project' offer additional insights into the collective action capacity of REPCs, as they reflect the ability of the active members to continue their collective action by adapting to their respective circumstances and to diversify their RE-portfolio, independent from their ability to realize large projects on their own. The indicators also made it possible to identify active and inactive REPCs. However, it was not possible to entirely answer the question why REPCs became inactive in the first place. Unfortunately, the only REPC of the questionnaire sample group that scored comparatively low on the durable collective action capacity indicators and that has been inactive since 2011 did not respond to an interview request, which would have likely led to further insights on this matter.

Although the scores on the indicators for intrinsic and extrinsic motivation were almost identical for both the sample and control group questionnaire participants, they still proved to be useful indicators to gain first insights on the motivation of active members to continue their collective action. In hindsight, however, it became clear that to gain further insights into the respective motivations it would have been useful to add an additional question in the survey with a list of different answer options and an additional text box for other possibilities, so that participants could have indicated on their own what intrinsic and extrinsic motives are the most important drivers to continue their collective action, i.e. managing the REPC with other active members and continually exploring and realizing new RE-project opportunities.

Finally, it was also possible to show that a SO and PO can potentially initiate collective action and activate members in the community to start a REPC, even when there were no plans for a similar project in the first place, as demonstrated in case A. However, it did not become clear if the initiated collective action in the municipality is also durable, due to the lack of data on REPCs that have been initiated by the SO and PO.

## *6.2 Validity of the research results*

The validity of the research determines the extent to which the research results are reliable. This relates in particular to the data sources, the qualitative nature of the research and the case and respondent selection.

First, regarding the data sources of this research, it can be assumed that most of the obtained results are relatively robust due to the narrow focus on SO and PO support in the

context of REPCs and the triangulation of data sources by conducting desk research (including the online research), expert interviews, questionnaires and semi-structured interviews. The triangulation of data sources enabled to draw a comprehensive picture of the SO and PO support in the context of the founding process and the durable collective action capacity of REPCs. However, the data sources need to be considered with regard to their validity. Due to the limited scientific literature on the issue under investigation, the theoretical framework bases to a large extent on different research strands (e.g. community energy and collective action literature), practical literature such as start-up literature for RECs and expert consultations. The triangulation of data sources also ensured the comparability of the cases, as identical information was sought for all of them.

Additional considerations about the data sources need to be particularly mentioned in relation to the questionnaire. With regard to the results on the indicators for perceived management capacity, organizational strength, intrinsic motivation and extrinsic motivation, which were obtained from the questionnaire responses, several reasons limit their validity. Due to the small N of questionnaire participants, the results from the questionnaire are somewhat flawed, as it became clear in the analysis of the data from the additional online research that both the sample and control group REPC could be separated into active and inactive REPC in terms of their latest project realization. Because almost only active participants of both groups took the questionnaire and only active REPCs wanted to take part in the semi-structured interviews for the case study, it was impossible to determine with certainty if the SO and PO involvement maybe also had negative effects on the durable collective action capacity of REPCs and why the share of inactive REPC was significantly higher in the sample group. Accordingly, the results mainly reflect the answers of active REPCs, which narrows the validity of the results even further. However, it also became clear that almost all active REPCs performed quite similar on all indicators, independent from SO and PO involvement, so that at least clear trends for active REPCs could be observed, e.g. that both active sample and control group REPCs did not differ a lot in their perception of the difficulty of the founding process, their human capital, their intrinsic motivation and extrinsic motivation. Moreover, even with the small N it was clearly visible that the sample group REPCs benefited from the institutionalized regional meetings organized by the VBBW in terms of frequent contacts to several members of other REPCs and from the connection to the municipality provided by the VBBW and EnBW Regional AG through the provision of low rent or free-of-charge roofs as part of the founding concept.

Generally, there is always the danger that the questions or answer options were misunderstood or that the judgement of the participants regarding the human capital and the motivations are over- or underestimated and do not reflect the actual human capital and motivations. In the semi-structured interviews, for example, it became clear that the questions regarding the extrinsic motivation, i.e. if the participant thinks that he or she will personally benefit from their personal engagement in the REPC and if they have a non-monetary incentive system, were differently interpreted by the participants. Regarding the personal benefit the misunderstanding can be traced back to the translation of the word 'benefit' to the German equivalent 'profitieren', which also can be interpreted as financially profiting from the engagement in the long run. While two participants interpreted it more in terms of personal financial profit, the other participants understood the word in the wider sense of personal benefits, as originally intended. It is likely that other participants also misinterpreted the question since the results widely varied in comparison to the results for other indicators. Similarly, the question about the presence or plans to introduce a non-monetary incentive system was misinterpreted. All interview participants stated in the questionnaire to not have a formal or informal non-monetary incentive system. However, on specific request all participants confirmed that they pay for personal expenditures related to the REPC, e.g. travelling expenses. Although examples have been given in the questionnaire,

it would have been more useful to directly ask if the REPC covers personal expenditures related to the REPC, to avoid the misunderstanding.

Additionally, with regard to the results on the RECPs' management capacity, especially the changing RE policy context in Germany needs to be taken in consideration. It has been asserted from the questionnaire that the amount of inactive RECPs is much larger in the sample group than in the control group. Although it cannot clearly be determined why this is the case, but is not unlikely that the policy situation after 2012 in combination with comparably lower profit expectations, the focus on low rent or rent-free roofs and the unavailability of said roofs, impaired their management capacity and thus durable collective action capacity. In relation to this, not only the profit expectations for new projects considerably sunk in comparison to projects that have been realized before 2012, but also other options to directly market PV-electricity to consumers in close proximity became insecure options due to the worsened investment climate caused by the on-going negative policy discussions. In this context it can only be assumed that in comparison to the control group, the inactive VBBW RECPs of the sample group were either not willing to invest in projects with a lower profit range than their previous projects and/or that their focus on rent-free or low-rent municipal roofs used for almost all past projects of the inactive RECPs narrowed their scope. Accordingly, the answers regarding the management capacity may be flawed due to the respective perception of the EEG amendments in 2012 and the current policy debate. As case A shows, it is possible that participants generally think that they are able to implement small PV-projects, but not in the current situation due to their profit expectations. However, it was not possible to entirely answer the question why RECPs became inactive in the first place. Unfortunately, the only REPC of the questionnaire sample group that scored comparatively low on the durable collective action capacity indicators and that has been inactive since 2011 did not respond to an interview request, which would have likely led to further insights on this matter.

Second, with regard to the qualitative nature of this research, it needs to be considered that the subjectivity of the researcher always plays into the interpretations. The triangulation of data sources and the rigorous coding of interview responses limited this as well as the research design, which ensured comparability.

Third, the case selections were carefully undertaken in two steps to ensure comparability of the cases and to set-up a research design that enables the isolation of SO and PO support. In the first step, RECPs with and RECPs without SO and PO support were selected for participation in the questionnaire. They were chosen based on three criteria cluster, namely attributes of the community, formal rules-in-form and material conditions. The second step of the case selections relates to the selection of two RECPs with SO and PO support and two RECPs without. These have participated in the questionnaire and were selected for the comparative case study. In order to increase the insights and ensure comparability, for each pair of RECPs one REPC was chosen based on poor performance in the assessment of the variables of the framework and one was chosen based on good performance in comparison to the other participants.

The focus on the two similar federal states of Baden-Württemberg and Bavaria ensured comparability so that the socio-economic context and the material conditions did not affect the results, while the focus on RECPs in municipalities with less than 30.000 inhabitants was flawed. Hereby it became clear in the statistical analysis that there is a positive correlation between the installed PV-capacity and the number of inhabitants. Therefore, the results of the comparison regarding the installed PV-capacity of both the sample and control group has a very limited validity, due to the fact that the control group RECPs contained a significantly higher number of RECPs in municipalities with more than 10,000 inhabitants in comparison to the control group RECPs. It has to be noted however that a focus on RECPs in municipalities below 10.000 inhabitants in combination with

selecting them from only two federal states would have significantly limited the availability of cases. On the other hand, adding additional federal states to select cases from would have limited the comparability due to higher variation in the socio-economic contexts.

### *6.3 Limitations of the research results*

The limitations of this research refer to the extent to which the conclusions drawn from this research are generalizable and to which extent they contribute to answering the main research question.

First, the generalizability of this research is limited by its research design, i.e. the conduction of mostly qualitative comparative case study research, which limits the external validity. In general, the results are limited to rural REPCs in communities with up to 30.000 inhabitants in Bayern and Baden-Württemberg. The geographical generalizability might be extendable to the other German federal states, yet it needs to be accounted for changing conditions, such as changing socio-economic contexts. The forms of support that are useful to foster the founding process and the durable collective action capacity of a REPC that starts out with PV-projects, can be assumed to be also generalizable to REPCs, SOs and POs in other national contexts, independent from the size of the municipality, as the identified forms of support in the analysis are also very likely to be useful for interest groups or REPCs in municipalities with more than 30.000 inhabitants. Yet, due to the limited external validity of this research, this assortment still requires testing. Similarly, the results with regard to the founding process and the durable collective action capacity can be assumed to be generalizable to other contexts that involve similar REPC models. Generally, the inclusion of more cases would increase internal validity and the inclusion of cross-unit cases would increase external validity (Gerring 2004).

Second, this research has enabled an initial exploration of the impact of SO and PO support for the founding process and for durable collective action capacity of REPCs. It has hereby used a very structured approach to assess the complex and diffuse dynamics of SO and PO support and in the initiation and maintenance of REPCs. Arguably, this might distort certain dynamics by not comprehensively catching this complexity. This research has taken care to consider other potential influences on the founding process and the durable collective action capacity of REPCs by identifying and analysing them, such as CAAs or municipal involvement. Also the juxtaposition of the sample group with a control group enabled to account for other influences. In contrast to the questionnaire, the interviews were also explicitly used to explore the diverse sources of influence by asking open questions and using semi-structured interview guides (see Appendix 7). However, also the comparative analysis of this research runs the risk of disguising context-related factors by rendering the complex reality to abstract while enabling the generation of general patterns. The detailed case studies and the careful comparison limit this possibility.

In conclusion, this research has considerably contributed to answer the research question by establishing a useful theoretical framework and conducting a detailed analysis, yet due to its limited external validity the established framework needs further empirical exploration with methodological rigidity.

### *6.4 Indications for further research*

The research has shown that the methodological approach and theoretical framework is generally useful to identify different types of intermediary organizations and REPCs and to assess the impact of intermediary organization support on the founding process and on the durable collective action capacity in the context of REPCs. Due to the exploratory nature of this research, several indications for further research can be made in order to complement and test the theoretical framework. For this the theoretical framework could be linked to

other theoretical literature, for instance relating to strategic niche management, transition management and institutional literature.

With regard to a complementation of the theoretical framework, it appears interesting to explore the variable intrinsic motivation of active members further and give the participants the opportunity to state their motivations individually next to asking about the specific indicators in the context of REPCs for civic and social gratification. This is considered an interesting issue for research also in the context of collective action literature and literature on the 'value-action gap'.

Moreover, it would be useful to add the indicator 'conduction of the founding event', to have a clearer distinction between support that was provided for the organization of the event (planning phase), e.g. renting functional room, preparing all the necessary legal documents, and support that was provided for the actual conduction of the founding event (founding phase). The interviews with the case study participants also revealed that the number of founding members is not a very useful indicator for the founding phase, as some interest groups deliberately start out with a small group, especially when they aim at becoming a socio-political or civic-ecological REPC with very specific goals. This way they can avoid long discussions about amendments of the code of conduct in the founding event. therefore this variable needs to be dismissed.

Additional indicators for the management capacity could be 'level of difficulty to conduct administrative matters' and 'average hours invested in administrative matters', e.g. annual statements, distribution of member dividends etc., and 'available working hours for REPC' 'availability of digital management tools' to be able to assess how much effort it takes for active members to conduct the minimum management tasks, to further explore the utility of support tools like member administration software etc.

The variable organizational strength could be considerably improved by including two more indicators namely 'presence of informal or formal internal rules of procedures' and 'number of management and advisory board members'. As case B and C showed internal rules of procedure, e.g. formal or informal in the form of protocols, can considerably facilitate the organizational understanding of active members. Case B and C moreover showed, that a high number especially of management board members can be useful in terms of management capacity, i.e. the management board has more manpower and therefore a higher threshold in terms of personal work capacities to jointly manage existing projects and/or to plan new projects. Moreover, they are also less vulnerable regarding unexpected drop-outs of active members as case B and C showed.

However, case C also showed that other active members outside of the management and advisory board can also be useful in terms of taking over small organizational tasks for the management board. An open and transparent meeting structure can ensure the inclusion of everyone outside of the management and advisory board who is interested in contributing actively to the further development of their REPC. Accordingly, the variable 'type of internal meeting structure' could be introduced and further developed in the framework to take the aforementioned into account.

Further insights could also be gained by using the methodological approach and theoretical framework to compare and assess different support concepts provided by SOs and POs in the same national contexts e.g. comparison of the VBBW and EnBW Regional AG founding concept with the GVWE's Weser-Ems Model in Lower Saxony. In this case, however, the different socio-economic contexts should be taken into consideration. With the respective amendments the methodological approach and theoretical framework could generally also be transferred to other national contexts. Moreover, the theoretical framework could also be used to compare support concepts of similar intermediary organizations, e.g. REC associations in cross-national studies, in order to gain further insights

on the role that the specific institutionalized rules-in-use in different context have on the founding process and the durable collective action capacity of REPCs.

## 7. Conclusion

This research started from the notion that the need to mitigate global climate change by reducing green house gas emissions requires an energy transition from a fossil fuel based energy system to an energy system based on RE. In this regard, a transition to a decentralized energy system based on renewables has been identified as the favorable option in comparison to a mixed or centralized system, due to the fact that it is less expensive, provides opportunities for citizens to actively participate in the energy transition in their locality, creates regional added-value in the regions where RE-systems are erected and that it could potentially contribute to a democratization of the European energy market that it currently dominated by a few large utility companies.

In this line, direct citizen participation models are useful vehicles to contribute to a decentralized energy transition, as they foster local acceptance and participation in realizing local or regional RE-projects. REPCs in particular represent suitable direct citizen participation models as the organizational structure of a cooperative ensures democratic control of the business and inclusion of members on important decisions regarding the future development of the enterprise. Moreover, the entrance fee in form of a single member share is relatively low, which ensures that many citizens can participate independent from their income.

However, it is not a given that local citizens organize themselves in REPCs, which can be attributed to the value action gap that describes the phenomenon that although people value environmental/sustainable behavior they often do not take action to act accordingly. Similarly, the collective action problem describes situations in which individuals have the incentive not to cooperate with each other although if they would do so they would all benefit. In the context of REPCs this means that individuals are often willing to participate in terms of investing in the local REPCs and their projects, but only few are also willing to establish and manage the REPC, as it includes a lot of expertise and effort and has to be conducted on a voluntary basis by active members, at least in the early years of the REPC. Moreover, it suggests that the long-term durability of the collective action undertaken by the active members to manage the REPC and realize RE-projects plays an important role for the future development of the REPC.

Recent research on the role of intermediary organizations in grassroots RE-initiatives suggests that intermediary organizations also play an important role in the establishment and development of the REPCs. The role of intermediary organizations is also reflected in the founding boom of REPCs in Germany that was partially initiated by the introduction of the Weser-Ems founding concept that was developed in 2008 by the intermediary GVWE and widely copied and adapted by other intermediaries and REPCs since. Therefore, the main research goal in this research was to investigate the impact of the involvement of such intermediary organizations, in form of support organizations and partner organizations, on the establishment and durable collective action capacity of a REPC. Accordingly, the support concept of the VBBW and EnBW Regional AG, that operate in the federal state of Baden-Württemberg, and the forms of ongoing support that both organizations provide have been analyzed. Moreover, sample group REPCs that did receive support and control group REPCs that did not receive the support, all operating in the federal states of Baden-Württemberg and Bavaria, have been compared in terms of their perceived difficulty to conduct the necessary tasks in the founding process and in terms of their durable collective action capacity, to detect if there was divergence in their responses. In the following, the sub-questions that helped to answer the main research question will be briefly answered.

### ***Who are the relevant intermediary organizations for REPCs?***

In this research the relevant intermediaries have been further distinguished into support organizations (SOs) and partner organizations (POs), based on the primary purpose of the

intermediary organizations and on their respective motives to support the interest group and later the REPC. It is important to note that the involvement of a SO does not necessarily exclude the additional involvement of a PO, and vice versa, as the jointly conducted support concept of the VBBW and EnBW Regional AG proved. A SO in the context of REPCs is here defined as a value-based agency that not only provides services and resources that aim at strengthening the human and organizational capacities of a local interest group to found a REPC and/or to implement a first renewable energy project, but also to support the further development of the REPC to accomplish its respective mission. Relevant SOs for REPCs therefore comprise cooperative associations that act as a facilitator in the founding process and the further development of the REPC and supports it with subject-specific expertise and skills. This includes general cooperative associations that aim to foster the development of cooperatives and the cooperative idea independent of their business field and REC associations that focus on fostering the establishment and the development of REPCs.

Relevant POs on the other hand may get involved in the establishment of a REPC or its further development for various reasons and while they can potentially play an important role as partners for the cooperative, supporting REPCs is not the primary task of a PO, as opposed to the SOs. Generally, local government agencies and market actors can potentially play an active role as POs in the founding process and the development of a REPC, either as co-founders or facilitators. While local government agencies include municipal governments as well as city and village councils, market actors comprise local banks, public utility companies and private utility companies. Motivations of POs to assist in the development of REPCs can for example include image-building, customer acquisition and accessing new market opportunities. While all POs can potentially be motivated to create a partnership with a local REPC by image-building gains, public and private utilities and local banks can especially be motivated by the perspective of customer acquisition and accessing new market opportunities.

This research question has been generally answered in section 2.3.1 of the theoretical part and specifically for the German context in sections 4.2 and 4.3 in the background sections. The relevant SOs in the context of REPCs could be deduced from the definition of the term SO on the basis of Brown and Kalegaonkar (2002) and were confirmed in the expert interviews. Relevant SOs in Germany include the five CAAs, where membership is mandatory, and the REC associations VBBW, LanEG Rheinland-Pfalz, LanEG Hessen and BürgerEnergie Thüringen e.V.. Relevant POs include German local government agencies, local cooperative banks, public and private utilities and RE-project development companies.

### ***What forms of assistance exist to support the founding process of a REPC?***

On the one hand, SOs can potentially provide REPCs with research and information resources, advocacy support and networking and alliance-building support in the founding process. Assistance through research and information can include providing interest groups with information packages that contain all the important documents for the founding process, such as legal forms needed for the founding event, sample code of conducts, sample business plans, sample roof leasing contracts and a step-by-step founding manual that shows in which phase what steps are important and what issues need special attention. Assistance through advocacy support by a SO in the founding process may include the provision of staff for consultancy meetings on specific issues and problems, the promotion of the founding event in the community through PR-assistance and the provision of staff to host the founding event. In more proactive approaches it can also include the conducting of the whole founding process including the founding event. Networking and alliance-building support may include establishing connections between the municipality and other POs with the interest group.

POs, on the other hand, can potentially provide REPCs with financial support, advocacy support and networking and alliance-building. POs can financially support REPCs



directly by becoming members or by providing a founding budget as the EnBW Regional AG does. However, the latter approach is so far not the norm and rather unusual. Municipalities often also provide the municipal roofs for a low rent or free of charge, especially when the municipality is also a member of the REPC and/or when they are involved in the founding concept like it was observable for the VBBW REPCs. Like SOs, POs can also potentially provide advocacy support by promoting the founding event of the REPC in the community. Nevertheless, POs can also additionally strengthen the interest group through the provision of staff that supports the interest group either as a co-founder or a facilitator with his or her respective expertise. Networking and alliance building support is similar to the support that SOs can provide, i.e. through connecting the interest group to other POs or SOs.

This research question was generally answered in section 2.3.2 of the theoretical part and specifically for the German context in sections 4.5.

***What forms of assistance exist that are aimed to foster the durable collective action capacity of the active members in a REPC?***

SOs can potentially provide ongoing assistance in terms of research and information provision, networking and alliance building and advocacy support to strengthen the durable collective action capacity of a REPC. The provision of research and information can include, sending frequent newsletters to indicate important developments, e.g. changes in policy, new project opportunities etc., and providing the management and advisory board with apprenticeships and seminars on general cooperative related topics, e.g. how to optimize the work processes between the management board and the advisory board, or REPC specific topics, e.g. direct marketing of PV-electricity etc. Through networking and alliance building support, SOs can also ensure contacts to and exchange between different member REPCs, especially through frequent and institutionalized network meetings. Additionally, SOs can help REPC to invest in or realize larger RE-projects through creating indirect participation models for REPCs like the VBBW with the project management holding BürgerEnergie AG, or through creating direct citizen participation models like LanEG Rheinland-Pfalz through the project development cooperative REGE eG.

In terms of ongoing support to strengthen the durable collective action capacity of a REPC, POs can potentially provide financial support through further investments in the REPC when new RE-projects have been acquired, and advocacy support through staff. The latter approach is usually taken up by public and private businesses that already provided staff for the interest group. The PO staff is usually elected into the management board to strengthen the organization and the management capacity of the REPC, with their respective expertise, e.g. staff of a public or private utility is likely to provide reliable technical expertise on RE-projects, while staff members of a local bank can provide his or her expertise on financial and taxing matters connected to the RE-projects of a REPC. In some cases, in Germany usually in REPCs that have been founded by VR-banks, the staff that has been provided for the management board can fulfill their tasks for the REPC during their regular working hours thus practically working for the REPC on the POs payroll, providing the REPC with an externally paid full-time management board.

This research question was generally answered in section 2.3.2 of the theoretical part and specifically for the German context in section 4.5.

***What forms of assistance have an influence on the establishment of a REPC?***

On the basis of the analysis of the VBBW and EnBW Regional AG founding concept and of the sample group REPCs as well as their comparison to control group REPCs, several specific forms of support that are useful to very useful for interest groups in the founding phase could be identified. The provision of research and information in form of an informational package that includes all documents needed for the founding event and sample code of conducts and sample business plans is very useful for interest groups and can positively

influence the planning phase in terms of avoiding time consuming research to formulate a legally sound code of conduct and to gather and work out the necessary legal documents for the founding event. This was not only confirmed by case B that received this form of support from the VBBW, but also by case C that received a similar informational package from their regional CAA and, lastly, by case D that did not receive this form of support from their regional CAA and had to put in a greater effort in gathering the necessary information and documents.

The analysis of the VBBW and EnBW Regional AG founding concept and the cases reveals that also advocacy support in terms of promoting the founding event through informational flyers and newspaper ads is seen as a useful form of support in the planning phase as it helps to reach many members in the community, which is perceived to be fostered by the collaboration with municipal representatives in terms of idealistic support in the flyers that are freely provided by EnBW Regional AG. In practical terms it saved the interest group additional time, money and effort by not having to deal with the promotion of the founding event. In the founding phase itself the advocacy support in form of staff provision for the founding event is very useful for REPCs as it helps them to make sure that the founding event has been conducted according to legal protocol. This is strongly reflected in all four interviewed cases as every case received this form of assistance and perceived it to be very useful, independent of their overall perceived utility of the respective SO.

The research also suggests that the assistance of the SO and PO is very useful in terms of alliance-building and networking support, which is reflected in the more substantial support that the VBBW REPCs receive from the municipality in comparison to the control group REPCs. As the inclusion of the municipality is part of the VBBW and EnBW Regional AG founding concept, the provision of municipal roofs for free or for a low rent for the first project(s) seems to come easier from municipalities in which VBBW REPCs operate.

Next to facilitating the founding process, the VBBW and EnBW Regional AG also proactively offer to conduct the whole founding process for a municipality, so that volunteers from the citizenry can take over a 'ready-made' REPC with an additional ready-made business plan for the first project. The model has been applied for several REPCs that have been founded between 2008 and 2010. This form of support seems to be very useful for communities that lack individual drivers or promoters for the idea to establish a REPC as case A revealed, since the REPC would not have been founded without the initiative of the SO and PO. Therefore, it shows that SOs and POs in the context of REPCs can potentially initiate collective action. However it could neither be confirmed nor excluded that the collective action undertaken by the active members is also durable in terms of further project realizations, since it was not possible to gain further insights on which REPCs exactly have been initiated by the SO and PO. Accordingly, connections between this form of founding support and the active and inactive sample group REPCs could not be identified.

This research question was answered in chapter 5 and especially in section 5.4.1.

### ***What forms of assistance have an influence on the durable collective action capacity of collective action undertaken by active members?***

The forms of assistance with the highest utility for strengthening the durable collective action capacity of the REPCs seem to be the provision of information and resources as well as alliance and network-building support provided by the SO and PO. In terms of research and information provision, the most useful form of support that could be identified in the analysis was the member administration software provided by the PO and the connected schooling provided by the SO, since it facilitates the process of producing annual statements, distributing member dividends and managing taxing matters. This saves valuable time for the active members. Therefore, it clearly strengthens the overall personal capacities of the active members, as it facilitates the management and administrative tasks of the REPC. The use of the software is, moreover, easy to learn so that new volunteers for the

management board can be quickly worked-in, when needed. Accordingly, it also fosters the organizational strength in terms of general replaceability of the management board to a small degree. Additionally, the provision of information regarding the roles and tasks of the management and advisory board offered through seminars by SOs is useful in terms of fostering the organizational strength which is reflected in case A and B, that perceived this form of support to have had a positive effect on the level of understanding on roles and related tasks in the REPC. However, it has to be noted that the free-of-charge seminar provided by the VBBW was more seen as introductory lesson, while the seminar offered by the CAA, albeit expensive, was perceived to be more useful as it provided in depth knowledge on the specific roles and tasks of the management and advisory board.

The form of assistance in terms of provision of networking and alliance-building support that proved to be very useful for building frequent connections to other REPC members are the institutionalized annual and regional network meetings organized by the VBBW, where members can exchange knowledge and experiences on past or upcoming projects, plan future collaborations etc. This meeting structure gives VBBW REPCs the advantage that they meet a larger number of members from other REPCs on a frequent basis in comparison to the control group REPCs. This can in turn potentially facilitate networking among VBBW REPCs in the same region and allow for more opportunities of knowledge exchange, which is also reflected in case B. This case received the necessary information for realizing a PV-business model based on direct marketing to consumers in close proximity, on request from another fellow VBBW member in one of the regional network meetings. Nevertheless, it can be considered as less useful for REPCs that are not located in proximity to other VBBW REPCs. Case A revealed that the low number of external contacts was due to the fact that only two other VBBW REPCs are located in the same region.

Besides information provision on policy developments in frequent newsletters, the VBBW REPCs received no support from the SO or PO that could potentially strengthen the management capacity in terms of the abilities of REPCs to realize different PV-business models, larger PV-projects and other large RE-systems. As cases B and C imply, the management capacity is mainly determined by the number of active members, their professional skills, knowledge and personal work capacity and the ability to adopt to the changes in support policy that have been introduced with the EEG 2012. Especially the durable collective action capacity of REPCs that to date solely focus on FiT based PV-projects on roofs offered free-of-charge has been impaired by the EEG-amendments and the ongoing policy debate since 2012, as reflected in cases A and D. This may offer a possible explanation why 40% of the sample group and only 20% of the control group REPCs have been inactive after 2011, as the realization of PV-projects based on FiTs and free municipal rooftops poses a central part of the VBBW and EnBW Regional AG founding concept. This is also reflected in the comparatively high provision of free municipal rooftops for the sample group REPCs that participated in the survey in comparison to the control group REPCs. It is likely that most inactive sample group REPCs did not perceive FiT-based PV-projects after 2011 as economically attractive, because the profit range of new projects consistently dropped with the introduction of the EEG 2012, in comparison to projects that have been realized before the 2012, and/or because no more private or municipal roofs were available that could be offered free-of-charge.

Forms of support for fostering the intrinsic and extrinsic motivation could not be identified, and moreover it was not possible to investigate the intrinsic and extrinsic motivation of inactive REPCs, as almost only active REPCs responded to the questionnaire.

This research question was answered in chapter 5 and especially in section 5.4.2.

***What recommendations for potential founders, REPCs and municipalities can be given in terms of adverse or beneficial effects of intermediary organization involvement?***

Due to the scope of this research the general recommendations regarding the involvement of intermediary organizations are restricted to REPCs German context. The specific recommendations regarding the VBBW and EnBW Regional AG support concept are restricted to interest groups and municipalities in the federal state of Baden-Württemberg. General recommendations in terms of potential advantages and disadvantages for the interest group in Germany, regarding intermediary involvement are presented in an overview in table 15. The left column displays the respective intermediary organizations that an interest group can get involved with, while the other columns point out the potential advantages and disadvantages.

*Table 15: Recommendations for interest groups/potential founders regarding support from intermediary organizations*

| Involved organization  | Potential advantages   | Potential disadvantages  |
|--|--|--|
| <b>Support Organization</b><br>(general cooperative associations and REC associations <sup>154</sup> ) | <ul style="list-style-type: none"> <li>- the provision of all the necessary documents by the SO; e.g. all legal documents that need to be worked out, sample code of conducts, sample business cases and business plan, step-by-step founding manuals etc. → Saves time and effort in the planning phase of the founding process</li> <li>- personal consultancy meetings for specific problems or questions regarding the code of conduct and organizing the founding event (including preparation of the founding documents)</li> <li>- provision of PR-support to promote the founding event, e.g. ads, informational flyers etc. (not all SOs offer this free of charge)</li> <li>- legal security in the founding process and especially through staff provision of the SO</li> </ul> | - n.a.   |
| <b>Partner Organization</b><br>(market actors and local government agencies)                           | <ul style="list-style-type: none"> <li>- <b>As co-founder:</b> Help in conducting organizational tasks in the founding process and the later development of the REPC through staff provision</li> <li>- Invoking legitimacy in the community as trustable partners of the REPCs, based on their respective expertise and reputation</li> <li>- Financial support through becoming a member</li> </ul>  | <ul style="list-style-type: none"> <li>- entails the danger that the partner gains a lot of influence on general and business specific decisions, which can have adverse effects when the interest of the PO diverge from the other REPC members especially when the PO has staff in the management board</li> <li>- <b>BUT:</b> this can however be countered due to the democratic decision-making structures, so that the general assembly can depose the management board if interests diverge to an unacceptable level for the other members</li> </ul> |

<sup>154</sup> More advantages through other forms of support possible provided by a specific REC association, table shows basics alone.

|                                     |  |                      |
|-------------------------------------|--|----------------------|
|                                     |  | involved in the REPC |
| <b>Public and private utilities</b> | <ul style="list-style-type: none"> <li>- Faster professionalization of the REPC, in terms of financial compensation for the management board</li> <li>- Expertise in realizing energy related projects</li> </ul>  | See above.           |
| <b>Local bank</b>                   | <ul style="list-style-type: none"> <li>- Faster professionalization of the REPC, in terms of financial compensation for the management board</li> <li>- Expertise in financial planning and taxing matters</li> </ul>  | See above.           |
| <b>Municipality</b>                 | <ul style="list-style-type: none"> <li>- Official community connection and idealistic support across political fractions → positive for local acceptance</li> <li>- provision of municipal roofs free-of-charge or for a low rent for first project(s)</li> <li>- PR-support through public announcements and distribution of info material</li> </ul> | See above.           |

Table 16 provides an overview on the recommendations for actors that want to found a REPC in Baden-Württemberg and that are considering the involvement of the VBBW and EnBW Regional AG in the founding process. The column on the left indicates the addressee to whom the recommendations are meant for, while the other columns show the potential advantages and disadvantages.

*Table 16: Recommendations for actors that consider VBBW and EnBW Regional AG founding concept + on-going support as VBBW members after the founding process*

| Actors                | Potential advantages  | Potential disadvantages  |
|-----------------------|---|--|
| <b>Interest group</b> | <ul style="list-style-type: none"> <li>- Time-saving in the planning phase through the provision of all the necessary documents; e.g. all legal documents that need to be worked out, sample code of conducts, sample business cases and business plan, step-by-step founding manuals etc. <b>(VBBW)</b></li> <li>- personal consultancy meetings for specific problems or questions regarding the code of conduct, business plan for the 1<sup>st</sup> project and organizing the founding event (including preparation of the founding documents) <b>(VBBW)</b></li> <li>- provision of PR-support to promote the founding event, e.g. ads, informational flyers etc. free of charge <b>(EnBW Regional AG)</b></li> <li>- legal security in the founding process and especially through staff provision of the SO <b>(VBBW)</b></li> <li>- provision of a unconditional €10.000 budget for covering the costs in the founding process → takes off financial risks from the interest group in the founding process <b>(EnBW Regional AG)</b></li> <li>- Free introductory seminar on task and roles of the management and advisory board <b>(VBBW)</b></li> <li>- Official community connection through municipal membership and idealistic support across political fractions → positive for local acceptance <b>(Municipality)</b></li> <li>- Provision of municipal roofs free-of-charge or for a low rent for first project(s) <b>(Municipality)</b></li> </ul> | <ul style="list-style-type: none"> <li>- <b>Regarding inclusion of the municipality:</b> entails the danger that the municipal actors gain a lot of influence on general and business specific decisions, which can have adverse effects when singular political interests dominate the decision-making and diverge from the other REPC members' interests especially when the municipality has representatives in the management or advisory board</li> <li>- <b>BUT:</b> this can be countered due to the democratic decision-making structures, so that the general assembly can depose the advisory or management board if interests diverge to an unacceptable level for the other members</li> </ul> |

|   |  |  |
|---|--|--|
| <p><b>As a member REPCs of the VBBW</b></p> | <ul style="list-style-type: none"> <li>- Time-saving in conducting the day to day management tasks due to provision of free member administration software + instructional seminar <b>(EnBW Regional AG + VBBW)</b></li> <li>- Frequent contact to other REPCs, through institutionalized general annual assemblies of the VBBW members and regional network meetings <b>(VBBW)</b></li> <li>- 'Ready-made' indirect citizen participation model to invest in wind farms owned and operated by EnBW Erneuerbare Energien GmbH <b>(VBBW + Bürger Energie AG)</b></li> </ul> | <p>involved in the REPC</p> <ul style="list-style-type: none"> <li>- Direct citizen participation models for larger RE-projects need to be realized independently, since BürgerEnergie AG is not a RE-project development company and solely offers to set up sub-companies as an investment vehicle</li> </ul>  |
| <p><b>Municipal representatives</b></p>     | <ul style="list-style-type: none"> <li>- Full service in conducting the whole founding process and providing the municipality with a 'ready-made' REPC, when local citizens do not take the initiative to found a REPC on their own<br/>→ can trigger collective action for realizing small FiT-based PV-projects in the region or locality</li> </ul>   | <ul style="list-style-type: none"> <li>- entails the danger that too few citizens can be animated to actively participate in the REPC or that</li> <li>- danger that collective action is not durable in terms of new project realization, when the REPC's focus stays on small FiT-based PV-projects on rent-free roofs and does not explore other marketing options or technologies</li> </ul> |

***Main research question: What impact has the involvement of a intermediary organization on the establishment of a renewable energy producing cooperative (REPC) and the durability of collective action undertaken by the active members of the cooperative?***

The answers provided to the sub-questions enable to respond to the main research question. Figure 16 shows which forms of support had what kind of impact in terms of their utility for interest groups on the sub-variables and indicators for the dependent variable founding process. Excluded from the framework are the financial support in form of the €10.000 budget provided by EnBW Regional AG, and the 'ready-made' REPC provision for municipalities as they impact the whole founding process.

Figure 16: Forms of support provided by the VBBW and EnBW Regional AG that have an impact on the founding process of REPCs in terms of their utility for the interest group

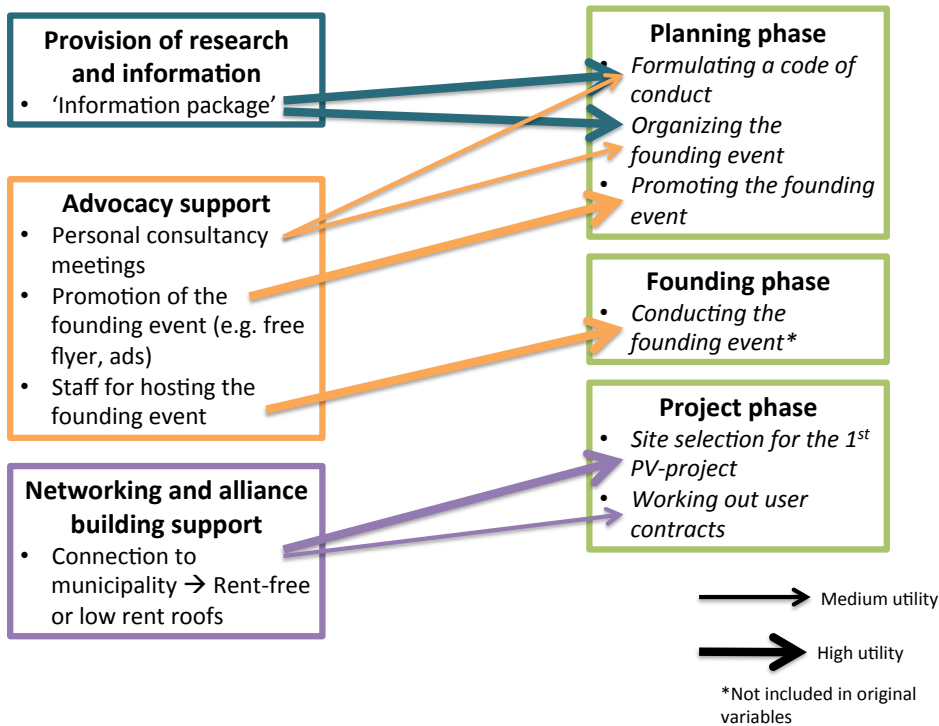
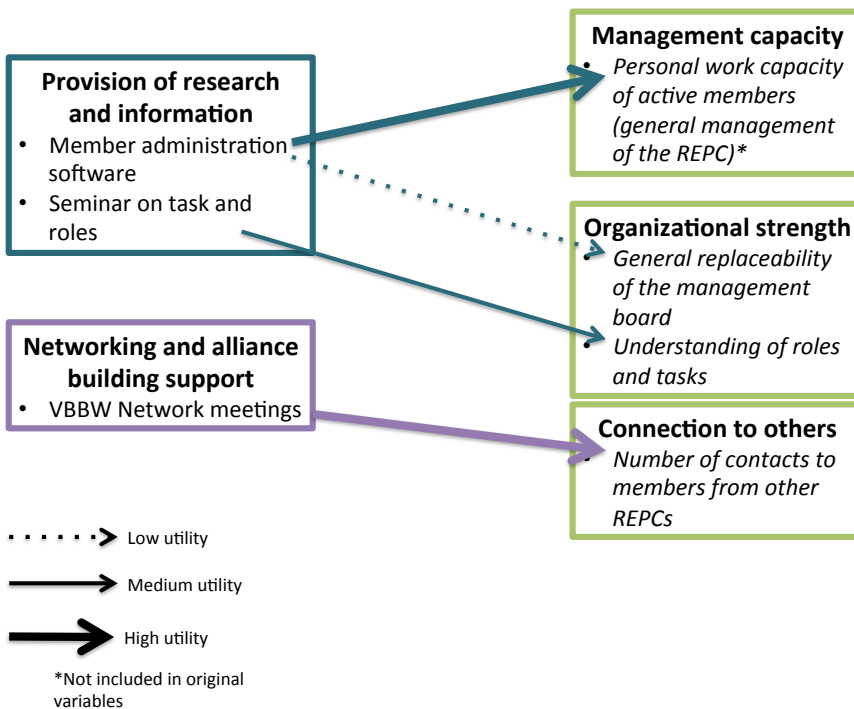


Figure 17 illustrates the impact and its strength of ongoing support from the VBBW and ENBW Regional AG in terms of utility for VBBW members on the sub variables and indicators of the dependent variable human capital.

Figure 17: Forms of support provided by the VBBW and EnBW Regional AG that have an impact on the founding process of REPCs in terms of their utility for the interest group



Negative impacts from intermediary involvement could not be detected, however it is interesting to note that the sample group REPCs that received support from intermediary organizations contained a higher proportion of REPCs that have been inactive in terms of project realization since 2011 (around 40%) while the control group REPCs contained a smaller proportion (20%). The reasons for this could nevertheless be entirely unveiled in this research, due to lack of additional data. However, also factors other than intermediary support had an influence on some of the dependent variables. Factors that seemed to have a negative influence on the management capacity of REPCs were the changes in the RE-support policy, which made FiT-based projects less profitable, and insecurities in the RE-investment climate caused by ongoing political debates, to which some REPCs seem to have problems to adapt. On the same basis also direct marketing based PV-projects to consumers in close proximity to the small or large PV-system were momentarily not seen as secure investment opportunities, only by REPCs with members that have RE-specific professional backgrounds. Additionally, they are connected to a higher management-load that not all active members want to bear due to limitations personal work capacity, time or management skills. However, the case studies also showed that REPCs could also adapt in various ways to the changing policy context, without stopping to plan and realize new projects. Project acquisition of larger projects through partner organizations of the VBBW, i.e. BürgerEnergie AG and EnBW Erneuerbare Energien GmbH, seem to be no useful option for most REPC, as trends in the data showed that REPCs that recently planned or realized larger RE-projects, preferred direct citizen participation models independent from the sample and control group. Differences in the sample and control group regarding their intrinsic or extrinsic motivation could not be observed, as well as forms of support that aim to foster these motivations. Due to the fact that almost only active members participated in the questionnaire, that had a high level of intrinsic and extrinsic motivation, no conclusions about the intrinsic and extrinsic motivations of inactive REPCs could be drawn.



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## Appendix

### Appendix 1: Variables and indicators identified in the literature review to construct a preliminary theoretical framework

| Main Variable                                   | Sub-Variable                   | Indicators  | Sources  |
|---|--------------------------------|---|--|
| <b>Founding Process</b>                         | <i>Orientation Phase</i>       | n.a.*   | *All indicators that are also used in the final framework have been derived from (Flieger 2009, Flieger 2011a; Kaiser & Steinle 2013) and backed up with additional information from the expert interviews |
|   | <i>Planning Phase</i>          | n.a.*   |  |
|   | <i>Founding Phase</i>          | n.a.*   |  |
|   | <i>Project Phase</i>           | n.a.*   |  |
| <b>Human Capital</b>                            | <i>Management capacity</i>     | Perceived management capacity to realize RE-projects independently          | (Barnes & Laerhoven 2013; Rogers et al. 2008)  |
|   |                                | Installed PV-capacity   | Own consideration; later backed up with expert interviews  |
|   |                                | Latest installed RE-project   | Own consideration; later backed up with expert interviews  |
|   | <i>Organizational strength</i> | Understanding of roles and related tasks in the organization                | (Barnes & Laerhoven 2013)  |
|   | <i>Connection to others</i>    | Number of internal contacts   | (Barnes & Laerhoven 2013; Leach & Sabatier 2005)   |
|   |                                | Internal contact frequency  |  |
|   |                                | Number of contacts to members of other REPCs                                |  |
| Frequency of contacts to members of other REPCs |                                |   |  |
| <b>Intrinsic motivation</b>                     | <i>Civic gratification</i>     | Level of interest in local RE-projects                                      | (Hoffman & High-Pippert 2005; Hoffman & High-Pippert 2010)   |
|   |                                | Level of conviction that personal engagement leads to regional added value  | (Staab 2013a)  |
|   |                                | Level of conviction that engagement in the REPC is a form of civic duty     | (Hoffman & High-Pippert 2005; Hoffman & High-Pippert 2010 Verba et al. 1995)   |
|   | <i>Social gratification</i>    | Level of enjoyment of working with active members                           | See above  |
|   |                                | Level of appreciation of personal work contribution by other active members | See above  |
|   | <b>Extrinsic motivation</b>    | <i>Confidence in future benefits</i>  | Conviction that personal engagement in the REPC is important   |
| Personal benefit expectations                   |                                |   | (Barnes & Laerhoven 2013)  |
| <i>Non-monetary incentive system</i>            |                                | Presence of a non-monetary incentive system                                 | Own consideration; later backed up with expert interviews  |
|   |                                | Plans to introduce a non-monetary incentive system                          | See above  |

Appendix 2: Operationalization of the founding process

2.1 Operationalization of the sub-variable orientation phase

| Sub-Variable                        | Indicators  | Operationalization   |
|-------------------------------------|---|--|
| Founding Process: Orientation Phase | <i>Recruitment of like-minded members</i>                               | Measuring the perception of an active REPC founding member on the level of difficulty to recruit like-minded members for the formation of an interest group.<br><b>Respective question in the questionnaire:</b><br>"The recruitment of like-minded individuals for the formation of an interest group proved to be..."<br><i>(a) Very easy; (b) Easy; (c) Fair; (d) Difficult; (e) Very difficult</i>   |
|                                     | <i>Recruitment of skilled members</i>                                   | Measuring the perception of an active REPC founding member on the level of difficulty to recruit skilled members for the formation of an interest group.<br><b>Respective question in the questionnaire:</b><br>"The recruitment of individuals with diverse and suitable backgrounds for the founding process (e.g. technical, business administrative etc.) proved to be..."<br><i>(a) Very easy; (b) Easy; (c) Fair; (d) Difficult; (e) Very difficult</i>  |
|                                     | <i>Decision-making on roles and related tasks in the interest group</i> | Measuring the perception of an active REPC founding member on the level of difficulty to decide on the respective roles and tasks of interest group members in the founding process.<br><b>Respective question in the questionnaire:</b><br>"Decision-making on the roles and related tasks of interest group members in the founding process proved to be..."<br><i>(a) Very easy; (b) Easy; (c) Fair; (d) Difficult; (e) Very difficult</i>  |
|                                     | <i>Decision-making for an adequate business model</i>                   | Measuring the perception of an active REPC founding member on the level of difficulty to decide on an adequate business model (e.g. technology and marketing of electricity) and to estimate first project costs.<br><b>Respective question in the questionnaire:</b><br>"Decision-making on an adequate business model (e.g. technology and marketing of electricity) for our REPC and first estimations of related project costs proved to be..."<br><i>(a) Very easy; (b) Easy; (c) Fair; (d) Difficult; (e) Very difficult</i> |

## 2.2 Operationalization of the sub-variable planning phase

| Sub-Variable                     | Indicators                                | Operationalization   |
|----------------------------------|---|--|
| Founding Process: Planning Phase | <i>Formulation of a code of conduct</i>   | Measuring the perception of an active REPC founding member on the level of difficulty to formulate an adequate code of conduct for the REPC.<br><b>Respective question in the questionnaire:</b><br>“Jointly deciding upon and formulating an adequate code of conduct for our REPC proved to be...”<br><i>(a) Very easy; (b) Easy; (c) Fair; (d) Difficult; (e) Very difficult</i>  |
|                                  | <i>Formulation of a business case</i>     | Measuring the perception of an active REPC founding member on the level of difficulty to formulate a solid business case.<br><b>Respective question in the questionnaire:</b><br>“Formulating a solid business plan for the first project proved to be...”<br><i>(a) Very easy; (b) Easy; (c) Fair; (d) Difficult; (e) Very difficult</i>  |
|                                  | <i>Organization of the founding event</i> | Measuring the perception of an active REPC founding member on the level of difficulty to decide on the respective roles and tasks of interest group members in the founding process.<br><b>Respective question in the questionnaire:</b><br>“Organizing the founding event (i.e. finding a proper location, general preparations for the event and presentations etc.) proved to be...”<br><i>(a) Very easy; (b) Easy; (c) Fair; (d) Difficult; (e) Very difficult</i> |
|                                  | <i>Promotion of the founding event</i>    | Measuring the perception of an active REPC founding member on the level of difficulty to promote the founding event in his/her community.<br><b>Respective question in the questionnaire:</b><br>“Promoting and advertising the founding event in the community proved to be...”<br><i>(a) Very easy; (b) Easy; (c) Fair; (d) Difficult; (e) Very difficult</i>  |

## 2.3 Operationalization of the sub-variable founding phase

| Sub-Variable                     | Indicators  | Operationalization  |
|----------------------------------|---|---|
| Founding Process: Founding phase | <i>Registration of the REPC</i>                   | Measuring the perception of an active REPC founding member on the level of difficulty to register the REPC at the official registry court.<br><b>Respective question in the questionnaire:</b><br>“The registration of our REPC proved to be...”<br><i>(a) Very easy; (b) Easy; (c) Fair; (d) Difficult; (e) Very difficult</i> |
|                                  | <i>Number of members after the founding event</i> | Measuring the number of members after the founding event as an indicator to see how successful the interest group was in gaining members.<br><b>Respective question in the questionnaire:</b><br>“Please fill in the blank. How many founding members could you generate in the founding event of your REPC?” _____             |

## 2.4 Operationalization of the sub-variable project phase

| Sub-Variable | Indicators | Operationalization |
|--------------|------------|--------------------|
|--------------|------------|--------------------|



|  |   |  |
|--|---|--|
| <b>Founding Process: Project phase</b> | <i>Selection of an appropriate site for their RE-project</i>            | Measuring the perception of an active REPC founding member on the level of difficulty to select an appropriate site for the first RE-project.<br><b>Respective question in the questionnaire:</b><br>"Selecting a suitable site for our first project proved to be..."<br>(a) <i>Very easy</i> ; (b) <i>Easy</i> ; (c) <i>Fair</i> ; (d) <i>Difficult</i> ; (e) <i>Very difficult</i>  |
|  | <i>Working out user contracts with property or roof owners</i>          | Measuring the perception of an active REPC founding member on the level of difficulty to work out a user contract for the first PV-project.<br><b>Respective question in the questionnaire:</b><br>"Working out a user contract with the building owner proved to be..."<br>(a) <i>Very easy</i> ; (b) <i>Easy</i> ; (c) <i>Fair</i> ; (d) <i>Difficult</i> ; (e) <i>Very difficult</i>  |
|  | <i>Decision-making on a PV-seller</i>                                   | Measuring the perception of an active REPC founding member on the level of difficulty to make an informed decision on the PV-seller.<br><b>Respective question in the questionnaire:</b><br>"Making an informed decision about a seller of PV-systems proved to be..."<br>(a) <i>Very easy</i> ; (b) <i>Easy</i> ; (c) <i>Fair</i> ; (d) <i>Difficult</i> ; (e) <i>Very difficult</i>  |
|  | <i>Working out a contract with an independent auditor</i>               | Measuring the perception of an active REPC founding member on the level of difficulty to work out a contract with an independent auditor for the first project.<br><b>Respective question in the questionnaire:</b><br>"Working out a contract with an independent auditor for the inspection of the PV-system proved to be..."<br>(a) <i>Very easy</i> ; (b) <i>Easy</i> ; (c) <i>Fair</i> ; (d) <i>Difficult</i> ; (e) <i>Very difficult</i> |
|  | <i>Working out a feed-in tariff contract with a local grid operator</i> | Measuring the perception of an active REPC founding member on the level of difficulty to work out a feed-in tariff with a local grid operator for the first PV-project.<br><b>Respective question in the questionnaire:</b><br>"Working out a feed-in contract with the local or regional grid operator proved to be..."<br>(a) <i>Very easy</i> ; (b) <i>Easy</i> ; (c) <i>Fair</i> ; (d) <i>Difficult</i> ; (e) <i>Very difficult</i>        |
|  | <i>Decision-making on an insurance for the PV-system</i>                | Measuring the perception of an active REPC founding member on the level of difficulty to make an informed decision on the insurance for the PV-system.<br><b>Respective question in the questionnaire:</b><br>"Making an informed decision on a suitable insurance for the first PV-system proved to be..."<br>(a) <i>Very easy</i> ; (b) <i>Easy</i> ; (c) <i>Fair</i> ; (d) <i>Difficult</i> ; (e) <i>Very difficult</i>                     |
|  | <i>Generation of external capital for the 1st project</i>               | Measuring the perception of an active REPC founding member on the level of difficulty to generate the external capital for the first PV-project.<br><b>Respective question in the questionnaire:</b><br>"Generating the necessary external capital (e.g. from a local bank) for the first PV-project proved to be..."<br>(a) <i>Very easy</i> ; (b) <i>Easy</i> ; (c) <i>Fair</i> ; (d) <i>Difficult</i> ; (e) <i>Very difficult</i>           |

*Appendix 3: Operationalization of SO and PO support in the founding process*

**3.1 Operationalization to measure the utility of SO and PO support in the orientation and planning phase**

| <b>Question: “The support through staff of the VBBW or staff of one of the partner organizations of the VBBW (i.e. EnBW AG and/or BürgerEnergie AG) was especially useful for...”</b> |                     |             |                |                 |        |             |
|---|---------------------|-------------|----------------|-----------------|--------|-------------|
|   | No support received | Unimportant | Less important | Somewhat useful | Useful | Very useful |
| <i>...the development of our interest group.</i>  |                     |             |                |                 |        |             |
| <i>...formulating an adequate business case for our REPC.</i>   |                     |             |                |                 |        |             |
| <i>...formulating an adequate code of conduct.</i>  |                     |             |                |                 |        |             |
| <i>...formulating an adequate business plan for the 1<sup>st</sup> PV-project</i>   |                     |             |                |                 |        |             |

**3.2 Operationalization to measure the utility of SO and PO support regarding the founding event**

| <b>Question: “The support through staff of the VBBW or staff of one of the partner organizations of the VBBW (i.e. EnBW AG and/or BürgerEnergie AG) was especially useful for...”</b> |                     |             |                |                 |        |             |
|---|---------------------|-------------|----------------|-----------------|--------|-------------|
|   | No support received | Unimportant | Less important | Somewhat useful | Useful | Very useful |
| <i>...the organization of the founding event.</i>   |                     |             |                |                 |        |             |
| <i>...promoting the event in the community.</i>   |                     |             |                |                 |        |             |
| <i>...the process of registering the REPC at the registry court.</i>  |                     |             |                |                 |        |             |

**3.3 Operationalization to measure the utility of SO and PO support in the project phase**

| <b>Question: “The support through staff of the VBBW or staff of one of the partner organizations of the VBBW (i.e. EnBW AG and/or BürgerEnergie AG) was especially useful for...”</b> |                     |             |                |                 |        |             |
|---|---------------------|-------------|----------------|-----------------|--------|-------------|
|   | No support received | Unimportant | Less important | Somewhat useful | Useful | Very useful |
| <i>...the selection of an appropriate site for their RE-project</i>   |                     |             |                |                 |        |             |
| <i>...working out user contracts with property or roof owners</i>   |                     |             |                |                 |        |             |
| <i>...decision-making on a PV-seller</i>  |                     |             |                |                 |        |             |
| <i>...working out a contract with an independent auditor</i>  |                     |             |                |                 |        |             |
| <i>...working out a feed-in tariff contract with a</i>  |                     |             |                |                 |        |             |

|  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|
| local grid operator                                  |  |  |  |  |  |  |
| ...decision-making on an insurance for the PV-system |  |  |  |  |  |  |
| ...generating external capital                       |  |  |  |  |  |  |

## Appendix 4: Operationalization of durable collective action capacity

### 4.1 Operationalization of human capital

#### 4.1.1 Operationalization of the sub-variable perceived management capacity

| Sub-Variable  | Indicators  | Operationalization   |
|---|---|--|
| <b>Human Capital: Perceived management capacity</b> | Level of management capacity for FiT-business models                          | <p>Measuring the perception of an active REPC founding member on the current ability of the active members to realize PV-FiT-business models in their region.</p> <p><b>Respective question in the questionnaire:</b><br/>           "I think that the combined knowledge and skills regarding the EEG feed-in tariffs within our REPC is currently sufficient to implement all types of PV-projects in our region (i.e. from small roof top projects to ground mounted systems) based on this marketing model."<br/>           (a) I strongly agree; (b) I agree; (c) I am undecided; (d) I disagree; (e) I strongly disagree</p>   |
|   | Level of management capacity for direct marketing models                      | <p>Measuring the perception of an active REPC founding member on the current ability of the active members to realize PV-direct marketing models in their region.</p> <p><b>Respective question in the questionnaire:</b><br/>           "I think that the combined knowledge and skills regarding different direct marketing models (e.g. PV-rent models, selling to electricity to consumers in immediate vicinity etc.) within our REPC is currently sufficient to implement all types of PV-projects in our region (i.e. from small roof top projects to ground mounted systems) based on this marketing model."<br/>           (a) I strongly agree; (b) I agree; (c) I am undecided; (d) I disagree; (e) I strongly disagree</p> |
|   | Level of management capacity to realize large PV projects independently       | <p>Measuring the perception of an active REPC founding member on the current ability of the active members to realize a large PV project within the next 5 years in their region without an external project developer.</p> <p><b>Respective question in the questionnaire:</b><br/>           "I think that our REPC is capable of implementing larger scale PV-projects (e.g. large roof top systems and ground mounted systems &lt; 1MWp) in the next 5 years, without having to consult an external expert (e.g. a project developer like juwi AG)."<br/>           (a) I strongly agree; (b) I agree; (c) I am undecided; (d) I disagree; (e) I strongly disagree</p>   |
|   | Level of management capacity to realize other large RE projects independently | <p>Measuring the perception of an active REPC founding member on the current ability of the active members to realize another large RE project within the next 5 years in their region without an external project developer.</p> <p><b>Respective question in the questionnaire:</b><br/>           "I think that our REPC executive is capable of implementing other larger scale renewable energy projects (i.e. erecting wind turbines or biogas power plants) in the mid-term, without having to consult an external expert (e.g. a project developer like juwi AG)."<br/>           (a) I strongly agree; (b) I agree; (c) I am undecided; (d) I disagree; (e) I strongly disagree</p>   |

#### 4.1.2 Operationalization of the sub-variable organizational strength

| Sub-Variable                           | Indicators   | Operationalization   |
|--|--|--|
| Human Capital: Organizational strength | Level of understanding of the roles and related task       | <p>Measuring the perception of an active REPC founding member on the current understanding of the active members regarding their different roles and tasks in the REPC.</p> <p><b>Respective question in the questionnaire:</b><br/>                     “I think that our REPC’s active members (e.g. members that get actively involved in voluntary work; this may, if applicable, also include non-executive and advisory board members) have full knowledge about the different roles and responsibilities within our REPC and there is seldom confusion on who is responsible for what.”<br/>                     (a) I strongly agree; (b) I agree; (c) I am undecided; (d) I disagree; (e) I strongly disagree</p>             |
|  | General replaceability of the management board             | <p>Measuring the perception of an active REPC founding member on the general replaceability of the current management board if the management board would unexpectedly resign on short notice.</p> <p><b>Respective question in the questionnaire:</b><br/>                     “I think that even with a short-term withdrawal of our current executive board members the voluntary management of our REPC (includes the management of current assets and future projects, similar to projects in the past) will be picked up by other members and continue until the full professionalization our REPC.”<br/>                     (a) I strongly agree; (b) I agree; (c) I am undecided; (d) I disagree; (e) I strongly disagree</p> |
|  | Replaceability of the management board in the same quality | <p>Measuring the perception of an active REPC founding member if the current management board could also be replaced in the short-term with the same quality in case of an unexpected resignation.</p> <p><b>Respective question in the questionnaire:</b><br/>                     “I think that in the case as presented in [...], other REPC members could undertake the voluntary management of our REPC (includes the management of current assets and future projects, similar to projects in the past) in the same quality as the current executive board.”<br/>                     (a) I strongly agree; (b) I agree; (c) I am undecided; (d) I disagree; (e) I strongly disagree</p>   |

#### 4.1.3 Operationalization of the sub-variable Connections to others

| Sub-Variable                         | Indicators   | Operationalization  |
|--------------------------------------|--|---|
| Human Capital: Connections to others | Level of connections to other active members of the REPC     | <p>Measuring how many active members meet regularly by asking the active founding member how many other active members of his REPC he regularly meets and contacts.</p> <p><b>Respective question in the questionnaire:</b><br/>                     With how many members do you have frequent and personal contact?<br/>                     Please fill in the blanks.<br/>                     Number of members: _____<br/>                     Frequency (e.g. 3x a month; 3x a year etc.): _____</p> |
|                                      | Frequency of connections to other active members of the REPC | <p>Measuring how often active members meet by asking the active founding member how often he meets other active members of his REPC.</p> <p><b>Respective question in the questionnaire:</b><br/>                     With how many members do you have frequent and personal contact?<br/>                     Please fill in the blanks.<br/>                     Number of members: _____<br/>                     Frequency (e.g. 3x a month; 3x a year etc.): _____</p>                                |

|  |   |   |
|--|---|---|
|  | <i>Level of connections to members of other REPCs</i>     | Measuring how many members of other REPCs the active members meet by asking the active founding member how many other members of other REPC he regularly meets and contacts.<br><b>Respective question in the questionnaire:</b><br>With how many members of other REPCs do you have frequent and personal contact? Please fill in the blanks.<br><i>Number of members:</i> _____<br><i>Frequency (e.g. 3x a month; 3x a year etc.):</i> _____          |
|  | <i>Frequency of connections to members of other REPCs</i> | Measuring how often active members meet with members of other REPCs by asking the active founding member how many other active members of other REPC he regularly meets and contacts.<br><b>Respective question in the questionnaire:</b><br>With how many members of other REPCs do you have frequent and personal contact? Please fill in the blanks.<br><i>Number of members:</i> _____<br><i>Frequency (e.g. 3x a month; 3x a year etc.):</i> _____ |

#### 4.2 Operationalization of intrinsic motivation

| <i>Sub-Variable</i>         | <i>Indicators</i>  | <i>Operationalization</i>   |
|-----------------------------|--|---|
| <b>Civic gratification</b>  | <i>Level of interest in local/regional projects</i>                                | Measuring if active members are primarily interested in realizing local or regional projects, by asking a representative active founding member.<br><b>Respective question in the questionnaire:</b><br>“Above everything else, our REPC is interested in the implementation of local or regional renewable energy projects.”<br><i>(a) I strongly agree; (b) I agree; (c) I am undecided; (d) I disagree; (e) I strongly disagree</i>  |
|                             | <i>Level of conviction that personal engagement leads to regional added value</i>  | Measuring if active members are convinced that their engagement in the REPC is a personal contribution to the regional added value of their community, by asking a representative active founding member.<br><b>Respective question in the questionnaire:</b><br>“I am convinced that I am personally contributing to the regional added value in the local community with my voluntary engagement in the REPC.”<br><i>(a) I strongly agree; (b) I agree; (c) I am undecided; (d) I disagree; (e) I strongly disagree</i> |
|                             | <i>Level of conviction that engagement in the REPC is a form of civic duty</i>     | Measuring if the active members are convinced that their engagement in the REPC is part of fulfilling their civic duty for their local community, by asking a representative active founding member.<br><b>Respective question in the questionnaire:</b><br>“I see my voluntary work within the REPC as part of fulfilling a civic duty for my local community.”<br><i>(a) I strongly agree; (b) I agree; (c) I am undecided; (d) I disagree; (e) I strongly disagree</i>   |
| <b>Social gratification</b> | <i>Level of enjoyment of working with active members</i>                           | Measuring if the active members enjoy their work together, by asking a representative active founding member.<br><b>Respective question in the questionnaire:</b><br>“I enjoy the voluntary work with other active members in the REPC.”<br><i>(a) I strongly agree; (b) I agree; (c) I am undecided; (d) I disagree; (e) I strongly disagree</i>   |
|                             | <i>Level of appreciation of personal work contribution by other active members</i> | Measuring if the active members have the feeling that other active members appreciate their personal work contributions, by asking a representative active founding member.<br><b>Respective question in the questionnaire:</b><br>“I feel that my contributions in working groups are highly appreciated by other working group members.”<br><i>(a) I strongly agree; (b) I agree; (c) I am undecided; (d) I disagree; (e) I</i>   |

|  |  |                          |
|--|--|--------------------------|
|  |  | <i>strongly disagree</i> |
|--|--|--------------------------|

#### 4.3 Operationalization of extrinsic motivation

| <i>Sub-Variable</i>                  | <i>Indicators</i>   | <i>Operationalization</i>  |
|--------------------------------------|---|--|
| <b>Confidence in future benefits</b> | <i>Level conviction that personal engagement in the REPC is important</i> | <p>Measuring if active members are convinced that their personal engagement will also be important in the future to achieve the goals as stated in the code of conduct, by asking a representative active founding member.</p> <p><b>Respective question in the questionnaire:</b><br/>           “In the long-run my personal engagement in the REPC will be important to achieving the collective goals of our REPC, as stated in our code of conduct.”<br/> <i>(a) I strongly agree; (b) I agree; (c) I am undecided; (d) I disagree; (e) I strongly disagree</i></p> |
|                                      | <i>Level of personal benefit expectations from engagement</i>             | <p>Measuring if active members are convinced that their engagement will personally benefit them in the long run beyond the annual rate of return of the REPC, by asking a representative active founding member.</p> <p><b>Respective question in the questionnaire:</b><br/>           “In the long-run my engagement in the REPC will also benefit me personally, beyond the annual return that every member is entitled to.”<br/> <i>(a) I strongly agree; (b) I agree; (c) I am undecided; (d) I disagree; (e) I strongly disagree</i></p>                           |
| <b>Non-monetary Incentive system</b> | <i>Presence of a non-monetary incentive system</i>                        | <p>Identifying if the REPC has a non-monetary incentive system, by asking a representative active founding member.</p> <p><b>Respective question in the questionnaire:</b><br/>           “Does your REPC operate a formal or informal internal non-monetary incentive system for active members to reward or compensate for voluntary work of active members?”<br/> <i>(a) Yes; (b) No</i></p>  |
|                                      | <i>Plans to introduce a non-monetary incentive system</i>                 | <p>Identifying the REPC is planning to install a non-monetary incentive system, by asking a representative active founding member</p> <p><b>Respective question in the questionnaire:</b><br/>           Are there concrete plans to implement a formal or informal internal non-monetary incentive system for active members to reward or compensate for voluntary work?<br/> <i>(a) Yes; (b) No (c) We already operate such a system.</i></p>  |

## Appendix 5: Case study scores

### 5.1 Case study scores on the dependent variable founding process

| SO support in the founding process         |  | Case A | Case B | Case C | Case D |
|--|--|--------|--------|--------|--------|
| <b>Orientation phase</b>                   | <i>Recruitment of like minded people</i>           | 5/0*   | 2/0    | 3      | 3      |
|  | <i>Recruitment of skilled members</i>              | 5/0    | 3/0    | 5      | 2      |
|  | <i>Decision-making on roles and tasks</i>          | 4/0    | 4/0    | 5      | 4      |
|  | <i>Decision-making on business model</i>           | 5/5    | 4/1    | 5      | 4      |
| <b>Planning phase</b>                      | <i>Formulating a code of conduct</i>               | 5/5    | 3/2    | 5      | 3      |
|  | <i>Formulating a business plan for 1st project</i> | 4/5    | 4/1    | 4      | 4      |
|  | <i>Organization of the founding event</i>          | 5/5    | 3/3    | 5      | 5      |
|  | <i>Promoting the founding event</i>                | 5/5    | 3/5    | 4      | 3      |
| <b>Founding phase</b>                      | <i>Official Registration of the REPC</i>           | 4/4    | 1/2    | 3      | 4      |
|  | <i>Number of members after the event</i>           | n.a**  | n.a**  | n.a**  | n.a**  |
| <b>Project phase</b>                       | <i>Site selection of the 1st PV project</i>        | 5/3    | 2/0    | 4      | 5      |
|  | <i>Working out property user contracts</i>         | 5/0    | 3/1    | 4      | 4      |
|  | <i>Decision for PV-seller</i>                      | 3/0    | 3/0    | 4      | 3      |
|  | <i>Contract with independent auditor</i>           | 3/0    | 3/0    | 4      | 1      |
|  | <i>FiT-contract with local grid operator</i>       | 4/0    | 2/3    | 3      | 4      |
|  | <i>Decision on PV-insurance</i>                    | 3/0    | 4/0    | 3      | 4      |
|  | <i>Generating external capital</i>                 | 5/0    | 3/0    | 3      | 2      |
| <b>Total score</b>                         |  | 70/80  | 47/80  | 63/80  | 55/80  |
| * (REPC score/Utility of SO & PO support); |  |        |        |        |        |
| ** Due to privacy requirements             |  |        |        |        |        |

### 5.2 Case study scores on the dependent variable human capital

| Human capital  |   | Case A | Case B | Case C | Case D |
|--|---|--------|--------|--------|--------|
| <b>Management Capacity*</b>  | <i>Management capacity FiT</i>                                  | 5      | 3      | 5      | 3      |
|  | <i>Management capacity direct marketing</i>                     | 4      | 3      | 5      | 3      |
|  | <i>Management capacity large PV-projects</i>                    | 4      | 2      | 4      | 4      |
|  | <i>Management capacity other large RE</i>                       | 2      | 1      | 2      | 3      |
| <b>Organizational Strength</b>   | <i>Understanding of roles and task</i>                          | 5      | 2      | 4      | 4      |
|  | <i>General Replaceability of the management board</i>           | 4      | 4      | 4      | 3      |
|  | <i>Replaceability of management board with the same quality</i> | 4      | 4      | 5      | 2      |
| <b>Total score ∅</b>   |   | 28     | 19     | 29     | 22     |
| <b>Connection to others</b>  | <i>Number of contacts (REPC internal)</i>                       | 3      | 6      | 11     | 4      |
|  | <i>Frequency of contact (REPC internal)</i>                     | 4      | 12     | 12     | 60     |
|  | <i>Number of contacts (RECP external)</i>                       | 2      | 10     | 1      | 2      |
|  | <i>Frequency of contacts (REPC external)</i>                    | 2      | 3      | 2      | 5      |
| * Data for management capacity about installed PV-capacity etc., excluded due to privacy requirements. |   |        |        |        |        |

### 5.3 Case study scores on the dependent variable intrinsic and extrinsic motivation

| Intrinsic & extrinsic motivation |   |  | Case A | Case B | Case C | Case D |       |
|----------------------------------|---|--|--------|--------|--------|--------|-------|
| Intrinsic motivation             | Civic Gratification                         | <i>Interest in local/regional projects</i>                               | 5      | 5      | 3      | 4      |       |
|                                  |   | <i>Conviction that personal engagement leads to regional added value</i> | 4      | 5      | 4      | 4      |       |
|                                  |   | <i>Conviction of REPC work as civic duty</i>                             | 4      | 5      | 4      | 4      |       |
|                                  | Social gratification                        | <i>Enjoyment of working with others</i>                                  | 4      | 5      | 4      | 4      |       |
|                                  |   | <i>Perceived appreciation by others</i>                                  | 4      | 5      | 5      | 4      |       |
|                                  | <i>Total score</i>                          |  |        | 21/25  | 24/25  | 20/25  | 20/25 |
| Extrinsic motivation             | Confidence in future benefit                | <i>Conviction that personal engagement in the REPC is important</i>      | 3      | 4      | 2      | 3      |       |
|                                  |   | <i>Personal benefit expectations from engagement</i>                     | 3      | 3      | 4      | 3      |       |
|                                  | <i>Total score</i>                          |  |        | 6/35   | 7/10   | 6/10   | 6/10  |
|                                  | Presence of a non-monetary incentive system | Presence of a non-monetary incentive system                              | No     | No     | No     | No     |       |
|                                  |   | Plans to implement a non-monetary incentive system                       | No     | No     | No     | No     |       |

#### Appendix 6: Overview of expert interview partners

Behr, Reinhold (Advisory board member and spokesperson of the Friedrich Wilhelm Raifeisen Energie eG, a successful civic-ecological REPC in Großbardorf (Germany) that owns and operates several local PV-systems and a wood chip heating system + heat grid that provides the villagers with renewable heat and electricity), Interview by Boris Stein, 06.11.2013.

Elpers, Anita (Management board member of the Neue Energie Genossenschaft eG, a successful civic-ecological REPC in Potsdam (Germany) that owns and operates local PV-systems in an urbanized setting) Interview by Boris Stein, 28.10.2013.

Flieger, Burkhard (Consultant for social and ecological businesses with the main focus on cooperatives, lecturer in the Munich University of Applied Science in the field of social economy, Management board member of the Solar-Bürgergenossenschaft REPC, representative of the consumer cooperative Greenpeace-Energie eG), Interview by Boris Stein, 11.10.2013.

Gottwald, Christoph (Auditor for the cooperative auditing association RWGV and consultant for the founding process and later development of cooperatives), Interview by Boris Stein, 28.10.2013.



Janik, Ralf-Peter (coordinator for the cooperative auditing association GVWE, consultant for the founding process and marketing projects for cooperatives), Interview by Boris Stein, 06.11.2013.

Kühn, Uwe (head of the management board of the Sonnenland eG, a successful and quickly expanding civic-ecological REPC in the region around Gießen (Germany) that owns and operates local PV-systems and a renewable heating system), Interview by Boris Stein, 05.11.2013.

Staab, Jürgen (consultant for RECs, Management board member of the Solargenossenschaft Biebergemünd eG, a successful REPC in Biebergemünd (Germany) that owns and operates local PV-systems), Interview by Boris Stein, 22.10.2013.

Strobel, Elisabeth (head of the management board of the VBBW e.V. and the Bürgerenergie AG and consultant for the founding process and later development of (to-be) member cooperatives of the VBBW), Interview by Boris Stein, 22.10.2013.

Voigt, Florian (Clustermanager in the Energiegenossenschaft Odenwald eG, a very successful institutional-organizational REPC in the Odenwald region (Germany), that was founded in close cooperation with a regional cooperative bank, and owns and operates regional PV-systems and windturbines), Interview by Boris Stein, 30.10.2013.

## *Appendix 7: Interview guides*

### **7.1 Interview guides semi-structured interviews with REPC and intermediary organization experts**

1. What factors have an influence on the level of difficulty for interest groups to conduct the necessary tasks in the founding process?
  - After answer of the interviewee: Explanation of the variable and indicators derived from literature for feedback.
2. Who are the relevant intermediaries in the context of REPCs?
3. What forms of active and passive support do they provide to REPCs in the founding process?
4. What forms of support from intermediaries is most valuable in the founding process and why?
5. What variables determine the available human capital in a REPC?
  - After answer of the interviewee: Explanation of the variable and indicators derived from literature for feedback, then: Can you think of additional indicators that may determine the human capital in a REPC?
  - What forms of active and passive support can different types of intermediaries provide to REPCs, to foster the available human capital in REPCs?
6. What variables determine the intrinsic and extrinsic motivations for voluntary work in a REPC?
  - After answer of the interviewee: Explanation of the variable and indicators derived from literature for feedback, then: Can you think of additional indicators that may determine the intrinsic and extrinsic motivation in a REPC?
7. [specific question that arose from answers to the leading questions]

### **7.2 Interview guides semi-structured interviews with practitioners in different types of successful REPCs**

1. Who had the idea in your community to establish a REPC and how did this idea develop until the official founding of your REPC? Please explain.
2. Could you maybe also tell me a little bit about your founding team or interest group (e.g. professional backgrounds, importance of particular members in the founding process)?
3. What do you personally think was the most difficult aspect of the founding process of your REPC (from the initial idea to the realization of the first project) and why?
4. What do you think is required of an interest group to successfully conduct the founding process?
5. What do you think is required of the active members to continue their collective action/voluntary engagement in the long run?

6. Did your REPC receive support from an intermediary organization? If yes what intermediary organization was involved and how useful was the support they provided? Please explain. (question includes explanation of the term intermediary organization)

7. [specific question that arose from answers to the leading questions]

### **7.3 Interview guides semi-structured interviews for background on VBBW and EnBW Regional AG support concept**

1. Can you please describe the purpose of the VBBW?

2. Can you please describe the support concept and the collaboration between the VBBW, EnBW Regional AG and BürgerEnergie AG to support the establishment of REPCs?

- Can you maybe outline the role and the support of each organization in the different phases of the founding process?
- Can you maybe also describe the role of the municipality in your support concept?
- What forms of support do you see as most useful for interest groups? Please explain.

3. Can you please describe the support concept and the collaboration between the VBBW, EnBW Regional AG and BürgerEnergie AG to support the further development of member REPCs?

- Does the VBBW also offer support to its members in terms of strengthening the personal abilities and/or capacities of active REPC members? Please explain.
- What forms of support do you see as most useful for existing members?

4. Does the VBBW, also collaborate with the regional cooperative association in any form? Please explain.

5. Does the VBBW also offer support to its members in terms of strengthening the personal abilities and/or capacities of active REPC members? Please explain.

6. [specific question that arose from answers to the leading questions]

### **7.4 Interview guides semi-structured interviews with sample group cases (cases A and B)**

1. Who had the idea in your community to establish a REPC and how did this idea develop until the official founding of your REPC? Please explain.

2. Could you maybe also tell me a little bit about your founding team or interest group (e.g. professional backgrounds, importance of particular members in the founding process)?

3. How would you describe the role of the municipality in the founding process of your REPC?

- Did you get support from the municipality in the founding process and if yes, how and why was it more or less useful to you?
- Do you still get support from the municipality?

- If yes, how and why is it more or less useful for the further development of your REPC?
4. Can you please describe the role that the VBBW and EnBW Regional AG played in the founding process of your REPC?
- What kind of support did you receive from each actor?
  - How and why was it more or less useful for the founding of your REPC?
5. Do you still receive support from the VBBW and EnBW Regional AG and if so what forms of support do you get, how useful are they and why are they more or less useful for the further development of your REPC?
- Did you ever make use of the seminars provided by the VBBW?
  - Do you find the institutionalized network meetings for VBBW members more or less useful for your REPC? Please explain.
6. Can you please describe the role that your regional cooperative auditing association played in the founding process of your REPC?
- Can you highlight what you personally perceived as the major differences in support from both your regional cooperative auditing association, the VBBW and EnBW Regional AG?
  - Did you receive support on formulating a code of conduct, a business plan for your 1<sup>st</sup> project and other relevant documents for the founding event and if yes how helpful has this been to you and why?
  - Did you get provided with staff for the founding event and if yes how helpful has this been to you and why?
7. Do you still receive support from your regional cooperative auditing association and if so what forms of support do you get, how useful are they and why are they more or less useful?
- Did you ever make use of the seminars provided by the CAA?
8. Do you think that your REPC would also have been established without the support you received from the VBBW and EnBW Regional AG? Please explain your answer.
9. Do you think that your REPC would also have been established without the support you received from the municipality? Please explain your answer.
10. If you had to list the most valuable forms of support and the most useful organization that assisted you in the founding process, what would be the most important and least important forms of support you received and who were the most and least useful organizations that were involved in your founding process? Please explain your answer.
11. [Specific questions regarding answers in the questionnaires].

## **7.5 Interview guides semi-structured interviews with control group cases (cases C and D)**

1. Who had the idea in your community to establish a REPC and how did this idea develop until the official founding of your REPC? Please explain.

2. Could you maybe also tell me a little bit about your founding team or interest group (e.g. professional backgrounds, importance of particular members in the founding process)?

3. How would you describe the role of the municipality in the founding process of your REPC?

- Did you get support from the municipality in the founding process and if yes, how and why was more or less useful to you?
- Do you still get support from the municipality and if yes, how and why was more or less useful to you?

4. Can you please describe the role that your regional cooperative auditing association played in the founding process of your REPC?

- Did you receive support on formulating a code of conduct, a business plan for your 1<sup>st</sup> project and other relevant documents for the founding event and if yes how helpful has this been to you and why?
- Did you get provided with staff for the founding event and if yes how helpful has this been to you and why?

5. Do you still receive support from your regional cooperative auditing association and if so what forms of support do you get, how useful are they and why are they more or less useful?

- Did you ever make use of the seminars provided by the CAA?

6. Do you think that your REPC would also have been established without the support you received from the cooperative auditing association? Please explain your answer.

7. Do you think that your REPC would also have been established without the support you received from the municipality? Please explain your answer.

8. If you had to list the most valuable forms of support and the most useful organization that assisted you in the founding process, what would be the most important and least important forms of support you received and who were the most and least useful organizations that were involved in your founding process? Please explain your answer.

9. [Specific questions regarding answers in the questionnaires].