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# Key Actors in Emerging Regional Transitions to Renewable Energy Self-Sufficiency

A Qualitative Analysis of the District Breisgau-  
Hochschwarzwald in Germany

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## Abstract

Increasing global energy demand and the simultaneous shortening of fossil resources are driving the development of alternative energy systems based on renewable resources. In regional transitions to renewable energy self-sufficiency various actors have been identified to be crucial for the successful implementation of self-sufficiency. This research is set out to find out about the role of key actors in 'starter'-regions and what factors should be fulfilled for regions to become energy self-sufficient themselves. To facilitate this investigation the case study of the administrative district Breisgau-Hochschwarzwald was chosen because it is still at the beginning of its transition. A number of research questions are posed to lead the investigation: Why was the renewable energy self-sufficiency target set by the district administration? Who are the key actors in Breisgau-Hochschwarzwald and what problems do they face? In comparison to 'best-practice' cases, what success factors should be fulfilled? The questions are addressed based on a theoretical framework which constitutes several theoretical considerations of actors' networks. 'Regional governance' is used to analyse influence cooperation between actors in network-like structures. The 'phase-model' is applied to examine the actor make-up at the initial stage of the regional energy transition. Furthermore, success factors were derived from the literature of 'best-practice' regions to compare the current stage of the actors' network in the case study to those regions that have already been successful. The theoretical framework guides the empirical investigation of the case study in which key actors from Breisgau-Hochschwarzwald were identified and interviewed using a qualitative interview approach to gather data material. The method of qualitative content analysis was used to analyse the interviews. The results show that the target was instigated from outside the district and that the district administration is not yet very active in implementing measures to reach their target. Meanwhile, a variety of key actors were identified to be involved in renewable energy related activities and projects and it stood out that they are acting independently of the district administration's target. This led to the realisation that key actors from the field of politics and administrative are underrepresented in Breisgau-Hochschwarzwald. A range of obstacles were identified which confirm this finding. Here, deficiencies in the cooperation of actors between the administrative level and the civil society and private economy level stood out as a major hindering factor as well as the voluntary engagement of many key actors from civil society. These findings were echoed in the results from comparing Breisgau-Hochschwarzwald to 'best-practice' cases and recommendations that were made by interview partners. With this, it was shown that the target was set from outside the district administration which corresponds to the findings that the most active key actors in Breisgau-Hochschwarzwald are from private economy and civil society. The shortage of actors from politics and administration and the related lack of communication between these actors groups is a major hindering factor to the transition of the district. Thus, the already existing network of currently active actors needs to be complemented by an involvement of key actors from the district administration.

# 1. Introduction

## 1.1. Problem statement

Recognition of the finite nature of resources and increasing fossil fuel prices have led to a change in the perception and nature of our behaviour towards our resource use today. Production and consumption of conventional energy sources are connected to climate change and other environmental and human health risks (Carlarne and Depledge 2011). As a result, many countries have adopted targets to transform their conventional energy system to a sustainable one (Araújo 2014). Germany has established itself as a pioneer, being among one of the first countries to initiate a comprehensive policy of transforming the energy system towards the use of renewable energy (RE) (REN21 2013).

One field of interest for analysing systems on their way to being principally based on regenerative energy is the socio-technical transformation to renewable energy self-sufficiency (RESS) at a regional level. Many regions in Germany and beyond have recognised the opportunities that come with a local transition to RESS and have taken action towards achieving it (100ee 2012; 2014). A variety of factors contribute to a successful transition and a central point within this process is the cooperation of key actors. While a number of researchers have dealt with this issue (McCormick and Kåberger 2005; Müller et al. 2011; Bomberg and McEwen 2012; Hauber and Ruppert-Winkel 2012; Sennekamp 2013), there is a gap in the current scientific discourse, as up to now mostly actors in 'best-practice' regions were studied (McCormick and Kåberger 2005; Walker 2008; Hauber and Ruppert-Winkel 2012), some of which have already achieved their energy targets, e.g. St. Peter (FNR 2014b) and Feldheim (FNR Fachagentur Nachwachsende Rohstoffe e.V. 2014). This research often looked at the beginnings, obstacles and success factors in retrospect thus largely general conclusions without specific details for the initial phase of the transitions were possible (e.g. Hauber and Ruppert-Winkel 2012). There is a lack of research into actors' networks in regions that are still at the beginning of their energy transition.

## 1.2. Research Objective and Research Questions

To facilitate an investigation of the early stages of regional transitions, the case of the administrative district (German: Landkreis) Breisgau-Hochschwarzwald in southern Germany was chosen. It was selected because of its status of a 'starter' region. There are a variety of factors that influence the transition to RESS, ranging from technical and political to societal and ecological aspects. With regard to social factors it is interesting to find out how people can drive forward or hinder transitions. To close the gap in knowledge this master thesis is set to find out how the situation of starter regions differs from that of 'best-practice' regions and what success factors should be fulfilled for starter regions to become energy self-sufficient themselves. Due to the limited scope available in the context of a master thesis study, the focus of this investigation is concentrated on the role of key actors. In order to achieve the research objective, the following research questions are posed:

Why was the RESS target set and why did actors get involved in the field of RESS?

Who are the key actors in Breisgau-Hochschwarzwald, in which fields are they active and how do they interact?

What obstacles do the key actors face?

From literature and 'best-practice' cases: What success factors are not yet fulfilled? What actors are missing and in which fields of action?

This study may provide valuable insights into the actors' networks that are present at the beginning of regional energy transition processes. In addition to studies that looked at processes that have arisen many years ago, this research concentrates on the present-day framework for regional transitions in Germany. The findings can serve as groundwork in the scientific discourse for further research in this field and to identify what factors need to be fulfilled for regional transitions to be successful. Besides scientific relevance, the results are of societal importance and can be fed back to the actors in the incipient transition to RESS in Breisgau-Hochschwarzwald as well as in other starter regions.

The research questions were developed based on the current state of scientific knowledge. The next step was to develop a theoretical framework appropriate to the research objective and research questions, both steps presented in chapter 2. The investigation followed a qualitative research design with interviews as a means to collect data and qualitative content analysis to retrieve results. This methodology is presented in chapter 3. Chapter 4 shows the findings from the empirical investigation of Breisgau-Hochschwarzwald. These are discussed in relation to the research objectives and literature in chapter 5. Finally, in chapter 6 the most important reflections are summarised and the significance of the results, potentials for further research and the limitations of this study are reviewed.

## **2. Literature Review and Theoretical Framework**

### **2.1. RESS in the literature and success factors derived from 'best-practice'**

Although regional energy transitions to RESS are a rather young research field, there is a range of scientific literature that deals with various aspects of this topic. Firstly, the meaning of 'regional' for the use in this study context should be clarified. There are various definitions for a region in the scientific literature as well as in society, and this vagueness can lead to misunderstandings (Pintaris 1995; Ellwein and Mittelstraß 1996; Keating 1997). In this research, the region under study, Breisgau-Hochschwarzwald, is defined by its political-geographical boundary. The German administrative district, 'Landkreis' is an administrative area comprising several municipalities, located between community level and the federal state level. Administrative districts are regulated by a district council and a district administrator.

To establish a basic understanding of the term RESS it would be sensible at this point to specify a definition. Yet this field of research is not comprehensively developed and definitions and concrete denominations overlap - e.g. energy autarky (Müller et al. 2011), energy sustainable communities (Zoellner et al. 2008), or community ownership of RE (Walker 2008; Li et al. 2013), to name only a few. Furthermore, in the practical application in Germany, labels such as '100% RES-communities' (RES = renewable energy sources) (100% RES Communities 2013), '100% renewable energy regions' (100ee 2014), or 'bioenergy regions' (BMEL 2014a) have been coined. In this study, the term RESS will be used according to the definition by Ruppert-Winkel and Hauber (2014) who state that RESS means that "the energy demand of a region is covered by the energy produced in the region based on renewable energies". In the literature of RESS certain fields of action are recognised. Ruppert-Winkel et al. (2013) for instance present the following fields of action: involvement of actors, regional value creation, regional development (land use, mobility, and settlement structure), use of RE, electricity grid management, and joint activities of actors. Here, a significant role is typically attributed to the activities of the involved actors (Hauber and Ruppert-Winkel 2012; Sennekamp 2013). Yet a detailed analysis of the role of key actors in starter regions is still missing, which is described in the following section. Due to the limited scope available in the construction of a master thesis, this missing area in the research field provides a suitable opportunity to concentrate on literature that addresses the role of key actors in emerging regional energy transitions.

One prominent approach in the scientific discussion about socio-technical change<sup>1</sup> is the 'multi-level-perspective' (MLP) described by Geels and Kemp (2007). It focusses on actor interactions on and between various levels (Geels 2012). It has been used extensively in the research field of socio-technical transitions. While being one of the most relevant research models in this field, it does not offer an all-embracing theory that can be used to understand the role of key actors in transitions to RESS.

Another stream in the scientific discourse is 'mobilization', which has been developed from social movement theories from the 1970s (McCarthy and Zald 1977). In recent years, mobilization has expanded into various areas, one of which is defined by Bomberg and McEwen (2012) as 'community energy'. Here, involving public actors is recognised as prerequisite for (renewable) energy projects and it supports actively involving communities in energy efficiency measures and RE production. While discussing the role of actors in energy transitions, this theory is of limited use for this study because it deals with citizen participation only. In contrast, this research focusses on a regional level where actors are typically representatives of organisations and associations. It is still useful to bear this concept in mind in the area of voluntary engagement of actors in energy transitions, investigating how citizen movements form and how they can potentially influence decision-making at administrative level.

In their study of different municipalities in Sweden, Martensson and Westerberg (2007) developed three strategy models for the transition to RESS. While pointing out guiding elements such as 'problem formulation', 'mobilization' and 'communication' that can aid municipalities in the implementation of bioenergy systems, the role of key actors is not the focus of analysis.

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<sup>1</sup> 'Socio-technical change' refers to "major changes in energy, transport and agri-food system" (Geels, 2010)



Likewise, Müller et al. (2011) present a wide-ranging conceptual framework for sustainable regional development, supported by an analysis of regions with conventional and autarkic energy subsystems. Again, their study provides a valuable roadmap for actors in administrations and civil society, yet it is not directly applicable to this study as it has a theoretical approach and key actors are not the main point of interest.

The stated literature deals with various aspects that touch on the role of key actors in transitions to RESS, yet a cohesive approach linking the role of key actors to successful regional transitions of 'starter' regions is missing. To understand what influences transitions to RESS, the next section gives an overview about selected literature that pronounces success factors found in 'best-practice' regions. Two issues should be noted here: Firstly, while this study concentrates on a regional district, the scientific literature often addresses towns or village communities. The conditions in towns naturally differ from those in regional settings. Nevertheless, the findings from these studies provide valuable conclusions that can be adapted to the regional context. Secondly, in most cases the literature is based on 'best-practice' examples. This means that regions or communities were investigated that already are at an advanced stage of their transition to RESS. The criteria for 'best-practice', however, are not defined consistently within the literature. In the following, an overview is given about the most common criteria for classifying 'best-practice' examples resulting in the presentation of success factors derived from these cases

Similar definitions for 'best-practice' examples can be found in scientific literature as well as in the practical context. For instance, regions in the project '100 renewable energy region' qualify as 'best-practice' if they fulfil the following criteria: having set concrete political targets for the transition to RESS (target level), actively working towards the realisation of targets (action level) and having already fulfilled sub-targets (status level) (100ee 2012). In their research, Bomberg and McEwen (2012) have chosen "‘effective’ examples of mobilization around energy issues“ and define the criteria for effectiveness such as "a sustained mobilization over a period of years", "energy projects that are at an advanced stage of development" and "securing external finance to support project development and/ or implementation“. Other researchers, such as Sennekamp (2013) state that "early commitment to development" and "completed projects" contribute to the status of 'best-practice'. Table 1 gives an overview of the above described 'best-practice' criteria, supplemented by further definitions.

**Table 1: Overview of 'best-practice' definitions in the literature (own design)**

'Best-practice' definition criteria	Source
Setting of concrete political targets Actively implementing measures Achievement of sub-targets	100ee (2012)
Sustained mobilization over a period of years Organisational structure with active membership Energy projects at an advanced stage of development Securing of external financial support	Bomberg and McEwen (2012)
Early development and implementation of measures Completed projects and measures Active involvement of pioneers	Sennekamp (2014)
Existence of a political commitment towards the target of RESS Share of RE in the local energy mix greater than Germany's average	Hauber and Ruppert-Winkel (2012)
A minimum of 50% of energy demand is covered by regional bioenergy Citizens are involved in the decision making Energy plants are (at least partly) owned by local actors The used biomass comes direct from within the region or its close vicinity	Bioenergy Villages and Regions (BMEL 2014b, analysed in Wüste and Schmuck 2012)
Setting of a common vision and concrete targets Planning and implementing measures Having achieved some measures and sub-targets	Müller et al. (2011)
Local bioenergy system covers entire heat demand and surplus electricity is exported	McCormick and Kaberger (2005)
100% of energy is produced from renewable resources	Li et al. (2013)

In summary, the main definitions for 'best-practice' examples among the literature are the existence of concrete political targets and an advanced stage in the implementation of measures towards these targets or achievement of sub-targets. With these definitions in mind, the literature was analysed to derive the following success factors for RESS<sup>2</sup>.

A prerequisite for the successful implementation of RESS is the **involvement of local inhabitants** and **self-ownership** of projects. Walker (2008) states that locally owned projects are more publicly accepted and result in fewer problems in obtaining planning permission. Similarly, Müller et al. find that local participation increases the legitimacy of decision processes and can increase social acceptance. The fact that local income can be generated supports the notion of local control of projects (Walker 2008). Supporting this idea, Li et al. (2013) draw a direct correlation between self-ownership and motivation of actors to support a transition process. It was found that in successful cases the process of change was initiated from the bottom-up, often by single actors that initiated innovative projects (Hauber and Ruppert-Winkel 2012). Similar findings made by Wüste and Schmuck (2012) confirm that the initiating person

<sup>2</sup> The literature was analysed using MaxQDA

acted as a driving force and that the impulse to realise RESS targets came from villagers themselves. This highlights the importance of early involvement of local actors in the planning and to make use of villagers' specific competencies (Wüste, Schmuck 2012). Bomberg and McEwen (2012) strengthen this position and state that political actors need to engage community actors in the decision-making on issues that affect them. The "participation of a broad variety of local actors encourages the inclusion of local knowledge and hence increases the quality of a project" (Martensson, Westerberg 2007).

It was found that one success factor is a **common identity shared by local actors** (Bomberg and McEwen 2012), which can be supported through common activities of the local inhabitants (Wüste and Schmuck 2012). A certain readiness by actors to assume risks is pronounced by Sennekamp (2013). He further underlines the importance of local participation by the need to adapt measures to local circumstances (Sennekamp 2013), which are best known by local inhabitants.

What is also needed for a successful regional transition to RESS is **financial backing** and a **supporting political framework**. Firstly, support from the local (regional) council and political key actors is a main success factor according to Wüste and Schmuck (2012). They describe the need for a holistic message that the RE project can achieve a variety of objectives. Hauber and Ruppert-Winkel (2012) describe that a milestone in the regional transition to RESS was the adoption of the idea of a RE in parliament so that it could serve as a guiding vision. It was therefore necessary that the ideas of RESS projects were realised by political incumbents (Hauber and Ruppert-Winkel 2012). Secondly, in addition to 'idealistic' support on the political level, practical support is a success factor in form of financial aid (Sennekamp 2013). Local acceptance should be supported by decision makers either through direct funding or through subsidised bank loans (Bomberg and McEwen 2012; Li et al. 2013; Sennekamp 2013).

Another success factor shared by many authors is the **cooperation of actors on and between hierarchical levels** (e.g. Wüste and Schmuck 2012; Hauber and Ruppert-Winkel 2012; Sennekamp 2013). It is crucial to foster a constructive cooperation between the community level and permit authorities, i.e. the district administration (Wüste and Schmuck 2012). This also means that the motivations for activities by community actors need to be understood by policy makers (Bomberg and McEwen 2012). In this respect, Hauber and Ruppert-Winkel (2012) describe this success factor in that political leaders identified actors and actively approached them. They also highlight the importance of cooperation between both technical and political actors. In their research, a crucial point for the transition to RESS was that "technical and political actors met on common ground" (Hauber and Ruppert-Winkel 2012). The formation of partnerships, taking into account the roles of different types of actors, such as local companies, research institutions and local governments, is highlighted by McCormick and Kåberger (2005). These authors share the notion that a trust-based cooperation between community and administrative/political level is vital for success. Additionally, Sennekamp (2013) describes the knowledge exchange across levels, for example through memberships in municipality-networks with external administrations. Also, a cross-party approach is stressed to take into account the interests of many different actors (Wüste and Schmuck 2012).

Another factor essential for a successful transition towards RESS is **communication and transparency**. Wüste and Schmuck (2012) observe that different information and communication strategies, such as information sessions, village meetings, site visits and personal conversations were essential to inform and motivate a wide range of citizens and to encourage sceptics. Furthermore, presenting ideas to other actors in an understandable way is emphasized by Hauber and Ruppert-Winkel (2012). It was also found that during information and communication processes, the principle of transparency is particularly important (Zoellner et al. 2008). In their study, this enabled all points of criticism to be openly addressed to local citizens (Wüste and Schmuck 2012). Transparency is especially important when dealing with problems arising during the RESS transition process as it is for “matters relating to finance and economy” (Wüste and Schmuck 2012).

One success factor that belongs in the field of communication, but deserves to be recognised as a standalone influence is **visits to or from pioneers**. In their research, Wüste and Schmuck (2012) describe that local actors benefit from contact with and support by actors from other RE projects, such as Bioenergy Village Juehnde or the town of Güssing, Austria. Visits to well-established model projects are a successful way to inform and inspire actors (Eigner-Thiel 2005) and serve as “positive reinforcements of the idea” (Hauber and Ruppert-Winkel 2012). Hauber and Ruppert-Winkel (2012) also find that organising events with pioneers from other regions (e.g. Güssing, Austria; Beckerich, Luxembourg; and Sweden) and “translating” successful examples into the local context secures legitimacy and support to the idea.

**Regional added value and development** can be specified as a success factor in its own right. Hauber and Ruppert-Winkel (2012) find that the perception of RE as an opportunity to create regional profit help RESS to gain support. In addition to ecological benefits, it is therefore vital to communicate the economical added value through RESS: In their study, Hauber and Ruppert-Winkel (2012) confirm that the idea of a ‘renewable energy region’ can serve as an instrument for regional development, thereby linking the motivation of involved actors to economic benefits. Motivation of actors is a precondition that, if not present in actors intuitively, can be supported through various efforts. Principally, actors need to hold an acceptance of the necessity of climate protection measures (i.e. RE projects) (Sennekamp 2013). This awareness of a necessity can be sustained by informing key actors and local citizens about the gains that RESS brings to a community. Li et al. (2013) describe the consideration that RE developments are beneficial for the community’s image, thereby attracting tourists which bring capital to the community. Therefore, the motivation for RESS can be strongly connected to community-interests and therefore attractive for residential and local government actors (Li et al). Walker (2008) also describes that lower energy costs and a reliable supply are arguments that stimulate the motivation for RESS involvement. In this sense, Wüste and Schmuck (2012) argue that synergy effects have a positive impact on acceptance and the “creation of a sustainable and local energy supply” is associated with improvements of living conditions.

There are a range of **external factors** that were found as supportive to the transition in ‘best-practice’ cases. They do, however, depend on individual circumstances and cannot be easily generalised. It is still important to be aware of these factors so as to recognise equivalent

conditions and make use of them. To this effect, Sennekamp (2013) lists the usage of opportunity windows as one of the main success factors in his study. In his example, opportunity windows for the development of climate protection measures were described as times in which people were attuned towards this topic through external factors such as the nuclear accident in Chernobyl, protests against a nuclear power station planned to be built in the vicinity of the study region and rising oil prices. This notion is confirmed by other authors who state that price fluctuations in the global energy market supported willingness to invest in RESS (Wüste and Schmuck 2012; Hauber and Ruppert-Winkel 2012). At the time of their research, the German Renewable Energy Act (EEG) was an external factor described by Hauber and Ruppert-Winkel (2012) that gave incentive to actors to engage and invest in RESS efforts). Similarly, McCormick and Kåberger (2005) describe that the introduction of a carbon tax in Sweden provided market conditions in which RE were sufficiently competitive with fossil fuels. The described success factors are summarised in Table 2.

**Table 2: Success factors from scientific literature of 'best-practice' examples (own design)**

Self-ownership and community participation
Support through political and financial framework
Cooperation on and between levels
Communication and transparency
Visits to / from pioneers
Motivation
Regional added value and development
External factors

## 2.2. Theoretical considerations

### Regional Governance

A prevalent reference framework in the scientific literature dealing with network structures in which public and private actors collaborate is 'governance' (e.g. Geels 2002; Smith et al. 2005; Verbong and Geels 2007). Energy transitions incorporate various hierarchical levels, as well as state and non-state actors. Fitting well to the research with a focus on the district of Breisgau-Hochschwarzwald, the concept of 'regional governance' will be the underlying framework of this master thesis. Kleinfeld et al. (2006) state that the boundaries between state and society are increasingly blending. There are various external control mechanisms which are used to steer people's opinions, decisions and actions. While financial incentives, such as the EEG, market competition or hierarchical instruments like building efficiency regulations are strong steering mechanisms, the focus of this research is key actors (Kleinfeld et al. 2006). In 'regional governance', public and societal actors interact equally and voluntarily in network relationships. Societal decisions are made as a result of these cooperations and through combination with

other mechanisms such as markets and negotiations (Böcher et al. 2008). According to Benz and Fürst (2003), 'regional governance' describes network-like structures in which public and private actors cooperate. These actors stimulate the emergence, progress and implementation of energy transitions and there are certain influencing factors that can affect cooperation in positive or negative ways. Influencing factors established by Benz and Fürst (2003) are (1) the purpose and situational conditions, (2) actors and orientation of their activities and (3) actor constellations and interactions. These elements will be detailed in the following with reference to the analytical frame and to the empirical investigation.

#### (1) Purpose and situational conditions

The purpose for cooperation between actors and the situational conditions in which they act strongly affect whether conflicts will arise during the cooperation and what type of actors are mobilised (Benz, Fürst 2003). In the case of Breisgau-Hochschwarzwald, the overall purpose of actor cooperation is the aim of achieving regional energy self-sufficiency. As Benz and Fürst (2003) describe there is a difference in outcome depending on whether there is an acute, collectively perceived problem in the region to which actors respond or whether there is a 'top-down' approach such as a public requirement for the region to fulfil certain action programmes. The nature of the target that is set will have a strong impact on the likelihood for it to be achieved. A binding target supported through the regulative system will result in a different commitment and participation make-up of actors than mere guiding visions with no regulative support. This investigation will therefore assess the character of the target of Landkreis Breisgau-Hochschwarzwald and the motivation of actors to get involved, which is reflected in the first research question.

Another parameter defined by Benz and Fürst (2003) is the scope of the topic. Here the question is posed, whether the present issue 'transition process towards RESS' refers to the region as a whole, e.g. in the form of a regional development concept or whether there are only sectorial cooperation needs. Regional topics are usually instigated 'top down' while sectorial actions often form from the 'bottom up' (Benz and Fürst 2003).

#### (2) Actors and orientation of their activities

A range of actors can be involved in RESS activities: energy producers (utilities and farmers), investors (banks, property developers), political actors (local council, citizens' action committees), supporting organisations (municipal administrations, NGOs), and consumers (private households, businesses) (Ruppert-Winkel et al. 2013). Benz and Fürst (2003) describe several criteria to evaluate the actors that are involved in a network. Firstly, it is decisive whether actors perform as individuals or collectively. While individual actors can act freely and have a high level of independence, they may also lack the means (e.g. funds, authority) available to actors organised in collectives. Collective actors in contrast can face internal difficulties in finding consent and may experience more problems in making strategic decisions than individuals (Scharpf 2006). Benz and Fürst (2003) state that 'regional cooperation' in Germany is primarily characterised by collective actors, such as communal and regional administrations, chambers of trade or commerce, and, to a lesser extent, enterprises and environmental organisations. They

also distinguish between 'generalists' and 'specialists'. 'Specialists' are commonly more dependent on cooperation with others, while 'generalists' (actors from politics or regulative authorities), have a higher level of decision power and they depend more on regional political committees rather than on cooperation with other actors (Benz and Fürst 2003). Orientation of actor activities mainly depends on their personal interests and motivation in the topic. Furthermore, willingness to cooperate is a prerequisite which is determined by past experiences of cooperation (positive or negative). The position in which actors perceive themselves to be situated in relation to other actors can also play a major role, i.e. whether they expect benefits from cooperation to be higher or lower than the alternative of acting independently. The described parameters can influence the way in which problems within the cooperation between actors are dealt with and thereby determine the outcome of the transition process toward RESS. This element is reflected in research question two, which enquires about the key actors and their involvement in Breisgau-Hochschwarzwald's transition to RESS.

### (3) Actor constellations

Actor constellations can be manifold due to the various backgrounds and characteristics of individual actors. Scharpf (2006) describes actor constellations as "strategic options, results of diverse combinations of strategies as well as preferences of players regarding these results" (Scharpf 2006). The above expressed orientations of actor interactions (individual and collective, generalist and specialist) add to this concept (Benz, Fürst 2003). Actor constellations shape the patterns of 'regional governance' fundamentally, as they determine what type of procedural rules, decision principles and, potentially, organisational structures of interactions can lead to consent in a particular group of actors. The element of actor constellation is taken up in research question two by exploring who the actors in Landkreis Breisgau-Hochschwarzwald are and how they are connected to one another. This concept is operationalised by examining the decisive power of actors, their readiness to cooperate or to act individually and the fields in which they are active. It is important to note that Benz and Fürst (2003) distinguish different actor constellations for varying phases, a concept which is taken up in the next section by presenting the 'phase model' by Hauber and Ruppert-Winkel (2012).

### **Phase model**

According to the 'best-practice' definitions given earlier (see Table 1), it becomes clear that while having outlined a political target for energy self-sufficiency, Breisgau-Hochschwarzwald is still at a preliminary stage of the implementation of active measures. In order to better understand the transition of Breisgau-Hochschwarzwald to RESS and particularly the role of key actors at the current, initial stage of the transition, the 'phase model' by Hauber and Ruppert-Winkel (2012) is used. The transition process towards RESS is shaped by a diversity of actors from different ranges of society, economy and politics (Ruppert-Winkel and Hauber 2014). They stand in certain relations to each other forming actor constellations, or networks, bringing in their personal motivation and expert knowledge. These networks, however, evolve over time and different actor constellations are present at varying stages of the transition process (Benz and Fürst 2003). It is therefore essential to identify the current phase of the regional transition

process in Breisgau-Hochschwarzwald, also in order to be able to compare the case of Breisgau-Hochschwarzwald to other regions. Investigating case studies of successful regional transitions to RESS, Hauber and Ruppert-Winkel (2012) developed a 'phase model' that can be used to assess the role of actors, their motivations and activities, which all influence socio-technical change. Hauber and Ruppert-Winkel (2012) defined three phases of the transition process: pioneer phase, pivotal network phase, and extended network and growing market phase. Each phase is characterised by the types of involved actors, their activities, their motives and artefacts<sup>3</sup>. Furthermore, they are influenced by the geographical, (e.g. contacts to other regions) and institutional (market conditions, political framework) wider context. These elements are central to the study of Breisgau-Hochschwarzwald and therefore the 'phase model' serves as a supportive theoretical tool to assess the role of actors at the current stage of the RESS transition. In order to relate the 'phase model' to this study, an overview is given for the main elements. Because it is assumed that Breisgau-Hochschwarzwald is positioned at the starting point of its RESS transition, the focus is put on the first phase labelled 'pioneer phase'.

### Pioneer Phase

The pioneer phase is characterised by a certain type of actors and their motivations and actions. Hauber and Ruppert-Winkel (2012) find that in the beginning of the RESS transition of their case studies, actors aimed to convince other actors of their ideas (technical and political). Firstly, two main groups of actors were identified: political and technical pioneers, including the first followers entering the market. Secondly, networks of the actors started to develop. An overview is given subsequently about these elements.

#### (1) Political pioneers

In the pioneer phase of the transition, political actors strove to “diffuse their idea of RE development within the region” (Hauber and Ruppert-Winkel 2012). This was done through organising events with leaders and pioneers from other successful regions, who served as motivation to the local society. In one case the regional parliament was willing to adopt the target of reaching RESS as proposed by the political pioneer. It is highlighted that in this phase, the commitment of political incumbents was fundamental for dispersing the idea. Concrete projects were started as a result of cooperation between technical and political pioneers. One of the dominating goals that helped sustain the installation of RE projects was the creation of investments and income in the region.

#### (2) Technical pioneers

Initially, technical actors had to go through a learning process in which they used and improved their knowledge regarding the implementation of their chosen RE project. Similar to political actors, the technical pioneers also collaborated with external actors from successful RE projects.

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<sup>3</sup> 'Artefacts' are defined as products of human activities such as documents related to a RE region or renewable energy plants (Hauber and Ruppert-Winkel, 2012). Due to the limited scope of this study, the element of 'artefacts' is not examined separately. It is rather considered within the background of the type of actors and their activities.



While the technical and political actors worked towards the implementation of their ideas, the first actors from the agricultural sector became involved in the field of bioenergy crops.

### (3) Formation of networks

A crucial factor for the progress of the transition to RESS was that technical and political actors connected and formed pivotal networks. This happened in different ways, but in all cases the actors met around a common project or goal (e.g. establishing a centre for energy, creating an 'Energiewirtschaft' (energy landscape) and involvement in the program 'Regionen Aktiv'<sup>5</sup>. Within these networks, the different actors' groups had varying motivations. While the political actors aimed to extend the ideas of RESS to other political bodies in the region, technical actors were concerned with the implementation of concrete projects. As mentioned above, a main motivator for the adoption of RESS was the creation of regional development and local added value.

## 2.3. The theoretical framework: Relation of success factors and the theoretical considerations

The success factors from 'best-practice' cases are reflected in the theoretical considerations and the 'phase model' offers the opportunity to deepen these connections. There are some success factors, however, which are not included in the theories and therefore should be added to the theoretical framework. Table 3 presents the theoretical framework that was constructed and shows how its elements are related to the research questions.

**Table 3: Key elements of the theoretical framework in relation to the research objective (own design)**

Theoretical element	Relation to research question (RQ)
Regional governance	
Purpose and situational conditions	RQ 1 (Why was the RESS target set?)
Actors and orientation of their activities	RQ2 (Who are the key actors and in which fields are they active?)
Actor constellations	RQ2 (How do key actors interact?)
Phase model	Relation to all RQ
Success factors from 'best-practice'	RQ 3 (What obstacles do actors face) RQ 4 (What success factors are not yet fulfilled and what actors are missing?)

<sup>4</sup>The 'Energiewirtschaft' is a project in Morbach in which a former military area was transformed into an area of RE production, featuring biomass, wind and solar energy production (Hauber and Ruppert-Winkel 2012)

<sup>5</sup>'Regionen Aktiv' was a competition in which regions implement strategies with the aim of environmentally friendly agriculture, strengthening of rural areas and regional value creation.

## 3. Research Design and Methods

### 3.1. Research Design

To answer the research questions, a qualitative research design was chosen. The empirical case study of the district Breisgau-Hochschwarzwald was chosen to assess the network of actors involved in the transition to RESS. This was done using an explorative case study approach with a comparative part. In the comparison, the empirical findings were contrasted to outcomes from research on regions that have already successfully implemented RESS targets and will hereafter be referred to as 'best-practice' cases. A deductive approach was taken, complemented by elements that were derived inductively in the analysis of the empirical findings. In the deductive part, a schematic was devised from the theories of 'regional governance' and the 'phase model', as well as the success factors (see Table 3), to pose questions to the data material. Semi-structured interviews were held for which the interview questions were also formulated based on the theoretical framework. Inductive reasoning was used to develop new elements from insights during data collection and analysis. In order to achieve this, the research process was held open: During the interview phase, the interview guidelines were regularly reviewed and adapted to new observations from the different interview partners.

### 3.2. Data collection

Qualitative expert interviews with nine key actors from the district Breisgau-Hochschwarzwald formed the primary source of data for this investigation. An initially planned document analysis was not carried out because almost no material, i.e. documents related to the RESS target was available. The main document that was used in this investigation was a potential analysis of Region Freiburg, featuring the district Breisgau-Hochschwarzwald published by Energieagentur Regio Freiburg (Energieagentur Regio Freiburg 2012).

In-depth interviews were carried out which allowed to explore the perceptions of the interview partners and allowing enough time for them to fully express their views. To ensure that enough information was gathered to obtain a valid analysis of the situation in Breisgau-Hochschwarzwald, it was planned for the interview phase to be completed when the interview partners' answers overlapped and provided no new information. Interview partners were identified based on the following criteria: spatial affiliation to Breisgau-Hochschwarzwald and their involvement in the topic of RESS measures. Selecting the interview partners was commenced with actors that were identified as central to the RE target of the district: The district administration and the energy agency that carried out the feasibility study in which the 2050 target is justified. The responsible person from both the district administration office of Breisgau-Hochschwarzwald and from the energy agency were contacted and interviewed. These first interview partners referred to other important actors, which were then contacted. In this way, further interview partners were identified through snowball sampling. Because the interview partners often referred to a range of other actors, only those were selected that were named by

most interview partners and fulfilled the other criteria mentioned above (spatial affiliation and involvement). This method of sampling, which was based on the point of view of interview partners, served to ensure that only actors were questioned that were considered important by the actual actors of the region. To reflect the diversity of different types of actors in the investigation, the following actor groups were determined and at least one actor from each group was interviewed: politics and administration, private economy, and civil society (individual or groups). Table 4 lists the interview partners and the respective actor group they belong to, as well as their position within their organisation. For data protection purposes, the names of interview partners were encoded with IP and a number, representing the order in which interviews took place, i.e. the first interview partner was coded with IP1 and so on.

**Table 4: Interview partners, corresponding actor group and position in organisation (own design)**

IP	Background	Actor group	Position in organisation
1	District administration Breisgau-Hochschwarzwald	Politics and administration	Temporarily designated person for RESS topics
2	Energieagentur Freiburg	Private economy	Division manager
3	Naturpark Südschwarzwald	Civil society	Director
4	Solarforum Hochschwarzwald	Civil society	Founding member
5	Citizens' Cooperative Lenzkirch	Civil society	Management board
6	Community Breitnau	Politics and administration	Political decision maker
7	Citizens' Cooperative Breitnau	Civil society	Management board
8	fesa e.V.	Civil society	Project manager
9	Badenova	Private economy	Director

Interview partners were contacted by email or phone to arrange personal meetings. In most cases, an appointment was obtained within one to three weeks of the first contact. All interviews were conducted during a time period of three months, between July and September 2014.

It should be noted that the first two key actors were identified by their close relation to the RESS target of Breisgau-Hochschwarzwald. However, not all subsequent interview partners were informed about the target and therefore could not be identified based on their affiliation with it. Consequently, most of the remaining key actors were chosen to be interviewed on the basis of their involvement in RESS related activities, either with focus on the RESS target or as individual involvement. Although 14 key actors were identified in total (see chapter 4.2), the number of actually conducted interviews was limited to nine for several reasons. 11 Key actors were identified and contacted during the interview phase. During the following data analysis, three more key actors were identified which could not be interviewed because of the meanwhile advanced stage of the research process. Of the eleven contacted interview partners, nine agreed to be interviewed. In one case the interview was delegated to the more informed person

of the same institution. In another case, the contacted person requested a reimbursement of time and therefore the interview did not take place. Interviews usually took place in the office of the interview partner. One was held in a quiet hallway of a municipal building and one was conducted in a café; both locations causing no noticeable disturbances to the interview partners or the course of the interview. Few minor disruptions, e.g. through phone calls or passers-by did not impede on the continuation of the conversations. In all cases, the interviews could be conducted fully and all questions were asked. The interviews lasted on average 60 minutes. In one case, the interview partner strove to answer the questions to such extent that the interview took over 150 minutes. The interviews were held in an open and friendly atmosphere and the actors were given opportunity to freely express their own experience and knowledge related to the field of RESS in the district

The interview questionnaire needed to fulfil certain requirements: Firstly, it should translate the research questions into more general questions that could be answered by the interview partners. These questions should contain the information necessary for the researcher to reconstruct the network structure of actors under investigation. The interview questions were adapted to the different partners based on their personal and professional background. Yet they were kept so inclusive that the content of the answers could be structured and compared to another. Secondly, the interviews should not exceed a certain amount of time. This was because the interview partners had limited time availability and both interviewer. All questions were therefore checked for relevance to content. Thirdly, the questions had to be understandable and held neutral, so as not to imply a certain answer and to avoid bias. The interview questionnaire can be found in Appendix A

### **3.3. Data analysis**

The interview recordings were transcribed into standard written German; the transcripts forming the basis for a detailed interpretative analysis (Mayring 2002). For the analysis of the material the focal point was the content and topical information described by the interview partners and not how they expressed the information. For this purpose, a set of transcription rules was developed in line with (Mayring 2002; Kuckartz 2005 and Gläser & Laudel 2010).

The transcripts were analysed using the software MaxQDA. Here, categories were established to which text passages were allocated using codes. The software enables an output of the sorted material, supports summarising, analysing and comparing of the interviews. The transcripts were initially examined sentence-by-sentence, then analysed as a whole and finally compared to each other.

Qualitative content analysis was used following Mayring (2007), supported by notions from Gläser and Laudel (2010). According to Mayring (2007), qualitative content analysis allows to analyse texts systematically and step-by-step, by means of a system of categories. In line with this, a descriptive system was constructed based on which the material was sorted into different categories and subcategories. This system was developed on the basis of the theoretical

framework and in close reference to the empirical data material. Gläser and Laudel (2010) describe the core ideas of qualitative content analysis as “to extract content information from a text, to convert this information into a suitable format, and to further process the information in this format, that is to say separately from the text”. Because the extraction, analysis and interpretation of information is subject to the researcher’s individual understanding (Gläser and Laudel 2010), each analysis step needs to be justified and explained in detail. This regulated and systematic approach is one of the strengths of qualitative content analysis and ensures the reliability and replicability of the study (Mayring 2007). One of the three main types of qualitative content analysis described by Mayring (2007) was chosen: the ‘summary’. It aims at reducing the material in such a way that the fundamental content is preserved and still is representative of the base material (Mayring 2007). Furthermore, the ‘summary’ can be used for building categories inductively.

Firstly, selection criteria for the development of categories were defined. This was done based on the research questions and therefore in line with the theoretical framework (see Table 3). For each research question, a category was created along with a coding rule, which was formulated as question to the text. The result was the following set of coding guidelines with four main categories (Table 5):

**Table 5: Coding guidelines of the category system (own design)**

Category	Coding rule
RESS process	How did actors get involved in the topic of RESS, in district of Breisgau-Hochschwarzwald? Why was the 2050 renewables target set?
Network of actors	Who is involved in RESS-related efforts? In which fields are actors active? How do they interact?
Obstacles	What problems do arise? What is lacking?
Improvements	What were success factors in pioneer regions?

For each interview, the analysis steps of paraphrasing, generalising and reducing described by Mayring (2007) were carried out using MaxQDA and Microsoft Excel. The encoded text passages were elevated to a higher level of abstraction. Once this first stage of summarising was completed for each interview, the level of abstraction was extended by further reducing the categories. This was done by summarising the reduced interview statements ‘cross-case’, that means the statements were not displayed only per interview, but generalised to overall accounts.

Subcategories were generated from the material by allocating text passages to the respective main categories, and by formulating suitable subcategories. During the analysis, the system of categories was continually adapted to the material. Overlapping categories were combined and promoted to a higher level of abstraction. New categories were created with novel information; other categories were renamed or extended. Categories with too many text passages were split up into smaller units. Ultimately, the system was put into a logical order. This feature of ‘openness’ of the analysis is in line with Gläser and Laudel (2010) and is characteristic of the

inductive character of the exploration. While the system of categories was adapted throughout the analysis with newly emerging and changing categories, no categories were removed to safeguard that the theoretical preconditions did not dissolve.

With this system, all relevant text passages were allocated to corresponding categories and the research questions could be answered. Because the interpretation of the data material is always subjective to the researcher (Gläser and Laudel 2010), it was aimed to express the exact wording whenever possible, so as to allow the reader to draw their own conclusions.

### Identifying and mapping the key actors

A central element of the theories used in this work is the idea of 'networks'. This notion, however, is characterised by different definitions and the context in which it is used in this study needs to be clarified. Franke and Wald (2006) differentiate three dimensions: network phenomena (e.g. political fields), network theory (e.g. theories of social capital) and the network method. In this master thesis, network analysis is used as a research method. The network analysis is defined by various authors as the main method for analysing social structures ( Pappi 1993; Emirbayer 1997; Trezzini 1998). It is used to examine relations, i.e. the patterns of relations between actors, rather than to examine the attributes of actors such as age, gender, etc. (Jansen 2006). It was used in chapter 4.2 to map the actors and their relations to each other. Key actors were identified based on the interview answers using a combination of quantitative and qualitative approaches. Firstly, key actors were selected by the number of times they were named by interview partners. In some cases the interview partners referred to more than one actor from the same community or organisation, in which case they were collated to this community or organisation. Sometimes, interview partners answered in general rather than giving specific names of actors. Also, while some interview partners had referred to important actors during the course of interview, when asked to name five key actors they named different ones. For these reasons, the quantitative classification alone was not enough to justify the classifications of key actors. So, the next step was to analyse the answers qualitatively taking into account the context in which the interview partners described the actors. In a recent study, Ruppert-Winkel (2014) described qualitative attributes that constitute key actors in RESS transitions: conviction that the local RE system positively affects global energy problems and fosters regional development, pragmatic approach to implementing concrete RE projects, and a high level of communication with other actors. Further, the social regional environment in which they exist offers the preconditions to becoming leaders (Ruppert-Winkel 2014). These and similar qualitative factors were taken into account to classify the key actors in Breisgau-Hochschwarzwald.

## 4. Results

### 4.1. The transition to RESS in the district Breisgau-Hochschwarzwald

#### 4.1.1. Historical overview about pioneers and RESS activities in Breisgau-Hochschwarzwald

The district of Breisgau-Hochschwarzwald is located in south western Germany in the Black Forest and the Upper Rhine Valley, with varying climatic zones and natural landscapes. The district shares 40km of border with France to the west. It has a population of about 250.000 inhabitants living in 50 towns and communities. It covers an area of 1378km<sup>2</sup> (2012), of which about 490km<sup>2</sup> are used for agricultural applications and 650km<sup>2</sup> are forest cover. The settlement and traffic area is about 140km<sup>2</sup> and the settlement structure is dispersed. The economy is dominated by tourism and agriculture, including winegrowing and small to medium scale farms, and there are various small-scale enterprises (Landkreis Breisgau-Hochschwarzwald 2014).

In Breisgau-Hochschwarzwald, renewables currently have a share of 8% electricity and 10% heat of the total energy supply, the same accounts for the Region Freiburg's renewable energy utilisation (Energieagentur Regio Freiburg 2012). With these figures, the district Breisgau-Hochschwarzwald and Region Freiburg lie below the average share of renewables for electricity use for the federal state Baden-Württemberg, 12% and Germany, 17%. The fact that Breisgau-Hochschwarzwald is utilising less renewable energy than the national average underlines its position as a starter community. Its current renewable energy production is mainly from solar photovoltaic, as well as hydro power, biomass and wind energy. A potential analysis of Breisgau-Hochschwarzwald shows that due to its large area it has significant potential for the development of its renewable resources. In the electricity sector the 100% target can even be exceeded and a surplus of more than 300 - 400% can be achieved, which is necessary to cover the City of Freiburg's electricity demand (Energieagentur Regio Freiburg 2012).

Interview partners were asked to name pioneers that initiated the first projects towards RESS in Breisgau-Hochschwarzwald. The community St. Peter was specified by 7 out of 9 interview partners, the communities Löffingen and Breitnau were named three times. The citizens' association Solarforum Hochschwarzwald as well as City of Freiburg-based Energieagentur Regio Freiburg were mentioned twice. The remaining pioneers were referred to once, respectively: The communities St. Märgen, Lenzkirch, Staufen, March; citizens' cooperative Dreisamtal; fesa e.V., Naturpark Südschwarzwald; energy utility Badenova; and Öko-Institut based in the City of Freiburg. The list of pioneers is presented in Table 6, which also shows whether the respective pioneers are based within the district or externally. In the following, a historical overview is given about the pioneers and their activities as well as other RESS related milestones in Breisgau-Hochschwarzwald.

**Table 6: Pioneers of Breisgau-Hochschwarzwald (own design)**

Based within Breisgau-Hochschwarzwald	Based beyond Breisgau-Hochschwarzwald
St. Peter	Energieagentur Regio Freiburg
Löffingen	fesa e.V.
Breitnau	Naturpark Südschwarzwald
Solarforum Hochschwarzwald	Badenova
St. Märgen	
Lenzkirch	
Staufen	
March	
Citizens' cooperative Dreisamtal	

Although the topic of RESS has only recently been taken up by the district administration of Breisgau-Hochschwarzwald, diverse RESS related efforts and activities have been carried out for several years. The administrative district Breisgau-Hochschwarzwald originated **1973** from the previous districts Freiburg, Müllheim and Hochschwarzwald. In 1984 the City of Freiburg introduced the 'environmental protection ticket', a monthly or annual ticket for the public transport system which also covers the area of Breisgau-Hochschwarzwald. Today called 'Regio Ticket', the ticket served to increase the use of public transport, thereby reducing the amount of energy needed for private transportation.

Fesa association was founded in **1993** in the City of Freiburg with the aim to establish a RE agency, which was realised in 1999 with the founding of Energieagentur Regio Freiburg. Although both organisations are based in the City of Freiburg, they are involved in RESS activities in Breisgau-Hochschwarzwald, backing RE projects as well as supporting local citizens' associations and other voluntary actors in the field of RESS.

Naturpark Südschwarzwald was founded in **1999** in Titisee-Neustadt as an association of several administrative districts, communities, associations, businesses and private persons as a joint area for landscape protection and economic development. Within Naturpark Südschwarzwald, the 'energy working group', in which Energieagentur Regio Freiburg is also a member, seeks to achieve RESS in the Naturpark Südschwarzwald area, which exceeds Breisgau-Hochschwarzwald and incorporates other adjacent districts. In **2005**, Naturpark Südschwarzwald carried out the competition 'Bioenergiedörfer am Start'. The program rewards already realised RE projects and thereby encourages further actions. One of the five winner communities that were elected in **2010** was the community Breitnau. Already in **1992**, a wind turbine was erected near Breitnau, which, at the time, produced the highest energy output in southern Germany. Other RE activities of the pioneer Breitnau are its citizens' energy



cooperative, several biomass, hydropower and solar energy plants and a district heating system. Currently, Breitnau already produces 150% of its own electricity and aims to increase its own heat supply to 50% (FNR 2014a).

Solarforum Hochschwarzwald is a citizens' association that was founded in **1998** in Titisee-Neustadt to support solar and other RE projects in the region. It provides consultancy for RE projects and promotes the use of RE through regular public excursions to successful RE projects.

St. Peter is the pioneer that was named most frequently by the interview partners. The community is well-known for its pioneering role in RESS. Its citizens' energy cooperative that runs the community's RE plants was founded in **1999**. St. Peter has already reached electricity self-sufficiency and is working towards supplying most of its heat demand by its own RE resources. RE projects in use are wind farm, solar energy plants as well as a district heating system.

The energy utility Badenova is another pioneer that has committed itself to supporting the energy transition towards RE and was created by merging various regional and municipal energy suppliers in **2001**. While employing its own renewable energy projects, Badenova also offers services to communities and associations that develop their own RESS and climate protection projects

As one of the more recent pioneers, the citizens' association 'CO<sub>2</sub>-reduced Lenzkirch' was established in **2011** in the community Lenzkirch to implement RE projects. The main focus currently lies on establishing a district heating system inspired by those systems in St. Peter and Breitnau.

In **1994**, Region Freiburg was established as cooperation between the two administrative districts Breisgau-Hochschwarzwald and Emmendingen, and the City of Freiburg, with the purpose of joint development. Its first project regarding RE was the development of the 'Solar Guide Region Freiburg' in **2004**, which gives an overview about solar energy projects within the area of Region Freiburg. In **2006**, another public mobility scheme was devised which provides free travel on public transport for tourists visiting the Back Forest Region. The 'Konus Card' is another step towards sustainable resource use and was initiated in part by the former mayor of the town of Hinterzarten of Breisgau-Hochschwarzwald. In **2012**, Energieagentur Freiburg published the results of a potential analysis based on a study by the City of Freiburg's FWTM (Freiburg Economy, Tourism and Trade Fare Corporation). This led to the ratification of the 2050 RESS target by Region Freiburg in **2013**. Figure 1 shows a timeline of the described milestones and involvement of pioneers in Breisgau-Hochschwarzwald.

To understand the motivations of actors and the circumstances under which they got involved in the field of RESS in Breisgau-Hochschwarzwald, interview partners were asked how they or their organisation first got in contact with the topic. Because the transition to RESS in Breisgau-Hochschwarzwald is still at the beginning and not centrally organised, it was difficult for the interview partners to precisely pinpoint their first point of contact with the topic of RESS specific

to the district's RESS goal. It stood out, however, that the topic emerged in the district administration approximately during the last five years, while the other interview partners got involved in RESS related activities in a time period ranging from three years ago back to twenty years ago. The main motivation to become involved in the topic defined by interview partners was personal interest. In the remainder of answers, it showed that the interview partners got involved with RESS in the district through their work activities in various ways, either by pursuing own RE projects or aiding others in their work.

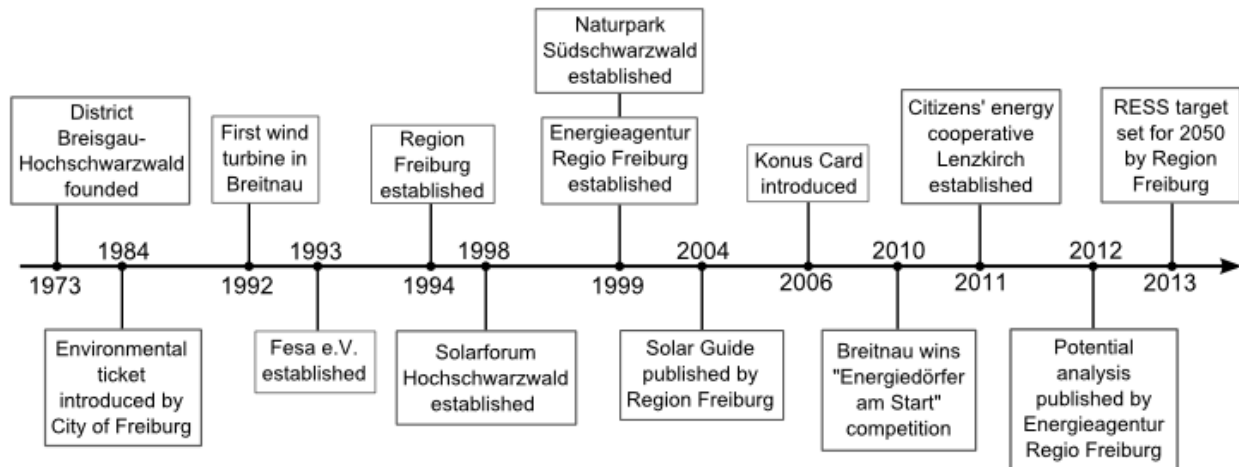


Figure 1: Timeline of RESS activities in Breisgau-Hochschwarzwald (own design)

#### 4.1.2. The 2050 target

The district Breisgau-Hochschwarzwald has a cooperation with the administrative district Emmendingen and the City of Freiburg; the three partners forming the Region Freiburg (Region Freiburg 2009). The cooperation was initiated in 1994 to enable joint regional development taking into account economic, social and urban development issues, as well as environmental and landscape aspects (Region Freiburg 2009). In 2013, Region Freiburg set out the target to become energy self-sufficient and to cover their energy demand entirely by renewable energy sources by 2050 (Region Freiburg 2013). This not only requires Region Freiburg to develop its renewable energy potential, but also to reduce its current consumption by 50% through efficiency measures (Energieagentur Regio Freiburg 2012). Furthermore, the City of Freiburg will not be able to meet the RESS target on its own due to its limited RE potential and therefore needs to import energy from the two adjacent districts. Based on a potential analysis by Energieagentur Freiburg in 2012, the Region Freiburg as a whole is able to reach the 2050 target.

During the interview with the responsible person from the district administration of Breisgau-Hochschwarzwald it became apparent that the RESS target of Region Freiburg was instigated from outside the district. Energieagentur Regio Freiburg was commissioned with carrying out a

potential analysis of RE in the Region Freiburg on the initiative of the environmental department of City of Freiburg and Cluster Green City Freiburg, an association of environmental and RE businesses. This shows that the motivation for the idea of RESS arose from the City of Freiburg. One interview partner, however, stated that although the impulse came from outside the district, both sides are needed for a successful transition. While Region Freiburg agreed on the common RESS target, there are currently no district-specific goals or political commitments for its fulfilment in Breisgau-Hochschwarzwald. During the data analysis, this realisation led to a more in-depth examination of how the topic of RESS and the 2050 target are dealt with at district level, described in the next section.

As explained above, the district currently has no policy in place to foster its own transition to RESS. Stated by the interview partner representing the district administration, the topic of RESS and RE-related topics are dealt with at the district administration in various, individual departments such as forestry, agriculture, economic development, municipal buildings. The field of energy efficiency plays a role in a range of authorising authorities. According to the district representative, the subject matter of RESS has emerged at district level approximately during the last five years. There is, however, no assigned working group that manages the environmental or RESS related topics centrally and across the various departments and internal hierarchies of the administration. Participation in the European Energy Award is planned for 2015, from which a range of measures related to RESS should emerge. In light of this, the development of RESS activities is intended to commence in 2015 with focus on energy efficiency in municipal buildings.

The fact that the topic of RESS has to this date not been specifically addressed at the district level is represented by statements of interview partners both from district level and other fields. On one hand, the district administration representative described a lacking overview about the RESS activities of the district's communities. Furthermore, a difficulty was described in that the communal authorities are responsible for their own policies, including RESS strategies, and that the district administration has no controlling instruments. On the other hand, local interview partners asserted that there are various activities towards RESS development at local level within the various communities and that motivation for the transition to RESS is present, yet the district administration has not taken up the idea of RESS.

This fact is also reflected in the interview partners' knowledge of the RESS target at the time of conducting the interviews. Five out of the nine interview partners were aware of the 2050 target. Table 7 summarises who had knowledge of the target at the time of interview taking and how they were informed about it. Of the five interview partners who had knowledge of the target, one was the responsible person from the district administration, therefore directly informed about it. One more interview partner stated that he knew about the RESS target because his company has close links to the political decision-makers at communal and district level. A third interview partner was the representative of Energieagentur Regio Freiburg, which conducted the potential analysis for Region Freiburg and therefore had knowledge of the target. The remaining two interview partners stated that they were informed about the target through their interactions with Energieagentur Regio Freiburg. Concluding, only half of the interview partners were aware of the

RESS target set out by the district administration. Of those that had knowledge of it, only one was informed about it through the district administration, while the others had heard about it from Energieagentur Regio Freiburg.

**Table 7: Interview partners' knowledge of RESS goal at time of interview (own design)**

Interview partner	Knowledge of RESS target	How did interview partner hear about the RESS target
IP1	yes	Responsible person at district administration
IP2	yes	Responsible person at Energieagentur Regio Freiburg
IP3	no	-
IP4	no	-
IP5	yes	Collaboration with Energieagentur Regio Freiburg
IP6	no	-
IP7	no	-
IP8	yes	Collaboration with Energieagentur Regio Freiburg
IP9	yes	Close links with political decision-makers

#### **4.1.3. Comparison of district Breisgau-Hochschwarzwald with district Emmendingen and City of Freiburg**

Breisgau-Hochschwarzwald is closely connected to Freiburg and Emmendingen not only through its neighbouring geographical position, but also through their political and administrative cooperation in the Region Freiburg. Interview partners were therefore asked how they perceive the district Breisgau-Hochschwarzwald in comparison to the City of Freiburg and the district Emmendingen.

Firstly, the pioneering role of the City of Freiburg was described by all interview partners. The label 'Green City Freiburg' was created to promote the City's modern and environmentally-friendly focus and the City is nationally and internationally recognised as a pioneer in this field. It was also stated, however, that statistically, the City of Freiburg does not show to be the 'greenest', most environmentally friendly city in Germany, and that its share of RE does not match with its pioneering role. Moreover, the City has created a trademark of 'green development' and successfully promotes it. Importantly, there has also been a conglomerate of key actors in the field of RESS and climate protection for many years. The City of Freiburg looks back on a history of actors involved in climate protection and RE issues. Activities leading the

City of Freiburg's pioneering role include the anti-nuclear movement ranging back to the 1970s, green urban development project Vauban, early 'energy plus'-buildings such as Heliotrop by architect Rolf Disch or the current development and redevelopments of 'energy-plus' high rise buildings, research institutes such as Öko-Institute and Fraunhofer Institute for solar research as well as the University of Freiburg's chairs with climate and RE focus, and associations and businesses in the RE sector such as fesa e.V., Energieagentur Freiburg, Solarfabrik and Solar Info Center. This non-exhaustive list of actors and activities stated by the interview partners illustrates that RESS related issues are focussed in Freiburg and therefore justify its pioneering role.

The close location of Breisgau-Hochschwarzwald to the pioneer City of Freiburg is perceived as an advantage by some interview partners. This is because tourism can benefit from the increased attention of the City as visitors often combine a stay in the renowned City with the exploring the surrounding rural areas. One interview partners described that visitors who come to Freiburg to explore its 'green attractions' such as the suburb Vauban will later also visit other success examples of smaller, community-scale RE projects like St. Peter or Breitnau. It was stated that therefore, the proximity of the City of Freiburg has positive effects on the district Breisgau-Hochschwarzwald which should be utilised. Focussing on the topic of RESS, interview partners described that despite the City of Freiburg's pioneering role and advantages in RE related issues, the City depends on the surrounding rural areas to achieve RESS. This gives the rural characterised administrative districts, Breisgau-Hochschwarzwald and Emmendingen, a new perspective because they hold the potential to supply not only their own energy demands, but also that of the City of Freiburg's. In this respect, the City of Freiburg does not solely hold a pioneering role in the field of RE anymore, but it needs to collaborate closely with the administrative districts as a result of its dependence on them.

The political environment in the City of Freiburg is described by interview partners as proactive and motivated to drive RESS forward. Positive preconditions present in the City of Freiburg are a greater financial budget as well as a more direct administrative structure compared to the administrative district Breisgau-Hochschwarzwald. Because cities are their own administrative authority as well as city administration, they have more direct control about their political and administrative programs. In contrast, the administrative districts, such as Breisgau-Hochschwarzwald, are the administrative authorities while the many communities present in the district have their own town administrations and therefore the regulating and administrating structure is more complex.

When asked to compare Breisgau-Hochschwarzwald to the district Emmendingen it became clear that it does not hold such a prominent role as the City of Freiburg. Interview partners were aware that Emmendingen's district administration is involved in the transition to RESS. A 'climate protection concept', which is a publicly funded program for mapping climate protection measures has been carried out in 2011 and the district recently employed a climate protection manager. The district is therefore in the implementation phase of RESS and climate protection processes.

Compared to both, City of Freiburg and district Emmendingen, Breisgau-Hochschwarzwald is perceived by interview partners as lagging behind and not very active. This was particularly attributed to the district administration. Its part in the cooperation Region Freiburg was also described to be limited and conservative. It was also stated, however, that once the district administration starts becoming active and implements a concrete strategy, it can quickly reduce its backlog and establish its transition to RESS. What is needed for this was described by interview partners as readiness and political commitment by the district administration to support the topic. There is a lot of potential within the districts many communities which can be utilised when supported from the district level. It was recommended as a next step for the district to employ a responsible person with the management of RESS, for example a climate protection manager, to make up for the current deficit.

## 4.2. Key actors in the administrative district Breisgau-Hochschwarzwald

### 4.2.1. The key actors and their activities

To gain an overview about actors that are involved in RESS related activities in Breisgau-Hochschwarzwald, the interview partners were asked “who are the key actors in Breisgau-Hochschwarzwald?”. The answers varied and a total of 71 different persons and organisations were named. To focus the analysis on key actors that are currently involved in RESS activities, the interview partners were asked to name the five most important actors they cooperated with during the previous six months. Subsequently, 14 key actors were identified, presented by actor group in Table 8.

**Table 8: Key actors in Breisgau-Hochschwarzwald by actor group (own design)**

Politics and administration	Private economy	Individuals or groups from civil society
District administration of Breisgau-Hochschwarzwald	Energieagentur Regio Freiburg	Naturpark Südschwarzwald
Political decision maker of Breitenau	Badenova	fesa e.V.
	Zelsius	Citizens' cooperative St. Peter
	Farmers	Citizens' cooperative Breitenau
	Sparkasse, Volksbank	Solarforum Hochschwarzwald
	Klimapartner Oberrhein	Citizens' cooperative Lenzkirch

It stands out that the majority of key actors are from the groups private economy and civil society, and only two key actors from politics and administration were named. Although active in

Breisgau-Hochschwarzwald, not all key actors are based within the district's boundaries. Figure 2 illustrates which actors are based within or outwith the district. In the following, an overview is given about the key actors and their fields of action in the RESS transition in Breisgau-Hochschwarzwald.

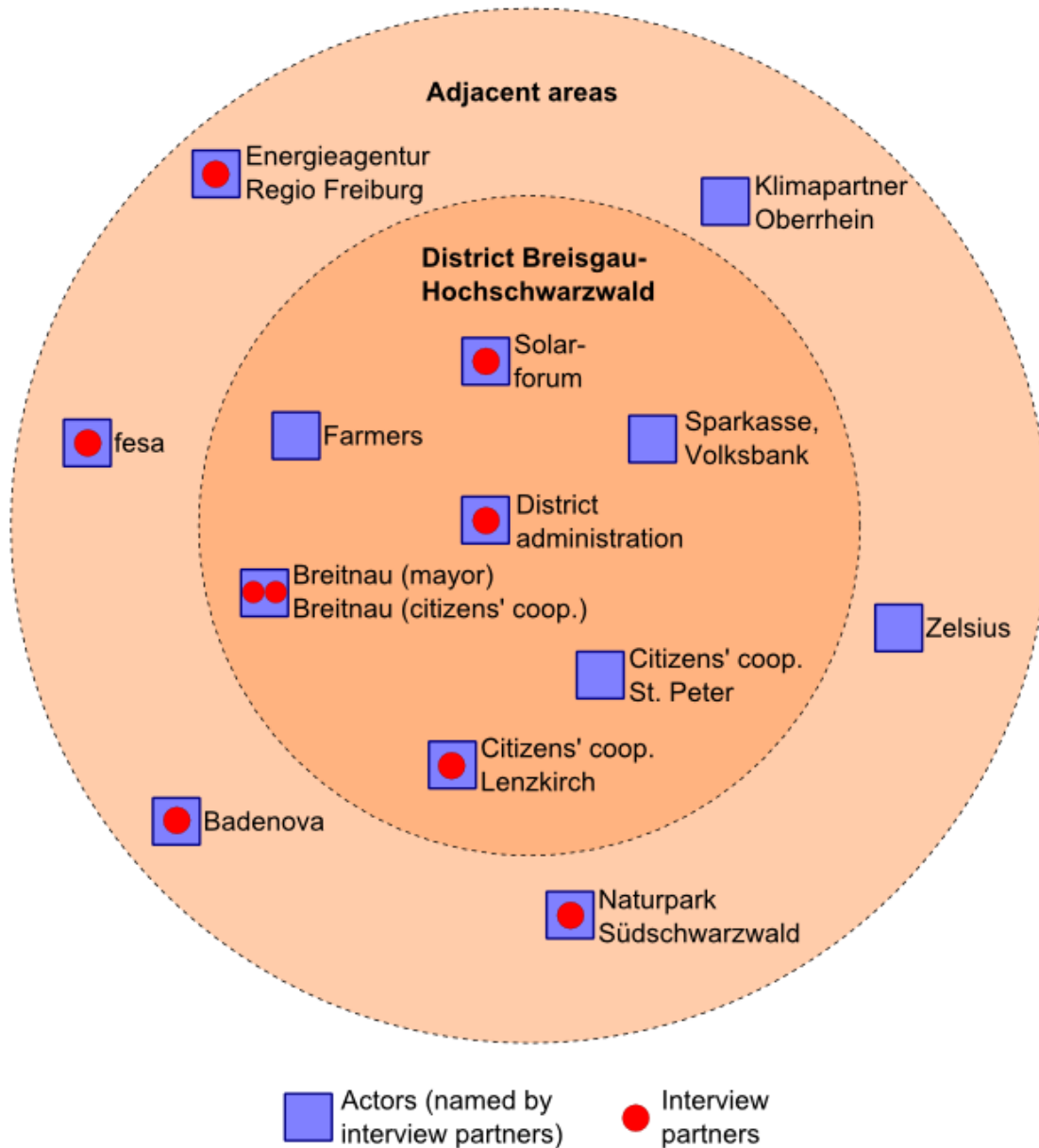


Figure 2: Key actors in Breisgau-Hochschwarzwald and their geographical position (own design)

The most prominent key actor, referred to by all interview partners is **Energieagentur Regio Freiburg**. The agency has this central role, amongst other factors, because it conducted the feasibility study for Region Freiburg and consequently for the district Breisgau-Hochschwarzwald. The district administration is therefore connected to the agency via the feasibility study, based on which the RESS target was set. It also emerged that the district aims at participating in the European Energy Award (EEA) scheme in 2015, in which the Energieagentur Regio Freiburg will function as a mentoring institution and provide consultancy to the district (IP1, 19, 39).

Besides the district administration also the other interview partners referred to Energieagentur Regio Freiburg. Because there are no energy agencies within the boundary of the district, the City of Freiburg-based Energieagentur Regio Freiburg has taken over this function. The agency is in contact with many actors in the district in various fields of action: advising communities or citizens' cooperatives in all matters related to RESS, organising information and networking events for regional actors, and providing funding, e.g. through the program "Energy Region Südschwarzwald".

*"Well, there are also organisations, which are not specifically restricted to the district Breisgau-Hochschwarzwald; there is for example the Energieagentur Regio Freiburg, who we have had very intense contact with and who supported us intensely in many areas." (IP6: 84)<sup>6</sup>*

When asked how they first heard about the district's target to become RESS by 2050, many interview partners referred to Energieagentur Regio Freiburg as their first point of contact. This underlines the central role of the energy agency and indicates that it is well established within the actors' network.

Another key actor interview partners referred to was **Naturpark Südschwarzwald**. While the association's headquarters are based within the district (on the mountain Feldberg) its range of involvement goes beyond the district's boundary, covering the greater Southern Black Forest region. Breisgau-Hochschwarzwald is a member of the Naturpark Südschwarzwald, which serves as a regional development agency with focus on the development of RE. Fields of action of Naturpark Südschwarzwald are promoting awareness and use of RE in the region with the aim to reach RESS and creating local value through the implementation of RE projects. It further serves as a platform for networking, bringing together actors of the region for instance through information and networking events. An important project that was initiated by the Naturpark was the initiative "Bioenergiedörfer am Start", which was co-funded by energy utility Badenova. This initiative was the catalyst for the founding of an energy cooperative and the implementation of a district heating system in the community of Breitnau, which will be explained later. The current program 'Energy Region Southern Black Forest' is carried out in conjunction with Energieagentur Regio Freiburg and provides funding for bottom-up community RE projects. The

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<sup>6</sup> Original citation: „Gut ansonsten gibt es Organisationen, die sind jetzt nicht speziell auf den LK beschränkt, das ist zum einen die Energieagentur Regio Freiburg, da haben wir auch sehr intensiv Kontakt gehabt, die haben uns auch sehr intensiv unterstützt in allen möglichen Bereichen.“ (IP6: 84)



Naturpark also has an advisory role, supporting the start-up of citizens' energy cooperatives and informing about legal as well as technical and administrative issues related to RE projects. It should be noted that Naturpark Südschwarzwald promotes EMAS-certification (Eco management and audit scheme) of agricultural businesses, which were identified as another key actor in the region as will be described later. This is another example for the importance of the association as a driving force for creating awareness and implementing changes towards RESS. The projects around the initiative 'Bioenergy Southern Black Forest' were also taken up by one interview partner, who referred to the "*central role of the Naturpark*" (IP5: 51). He further stated that while he is "*not aware of activities of the Breisgau-Hochschwarzwald district administration, the Naturpark plays a central role in the district's transition to RESS.*" (IP5: 124).

The association **fesa e.V.** was founded in the City of Freiburg in the 1990s with the mission to establish an energy agency: the Energieagentur Regio Freiburg. It has since then acted as a promoter of RE projects in the region around the City of Freiburg including district Breisgau-Hochschwarzwald. The fields of action include creating public awareness of RE through lectures, a newspaper and various RE-related projects. It also actively works to link the various actors involved in the area of RE and to provide training and information on related themes through conferences and network meetings. During the interviews it became clear that fesa e.V. plays an important role for different kinds of actors in Breisgau-Hochschwarzwald, ranging from organisation such as Naturpark Südschwarzwald and Energieagentur Region Freiburg to civil society actors such as the citizens' energy cooperatives, in that it actively seeks to create and support actors' networks.

City of Freiburg-based energy utility **Badenova** was named by various interview partners to be of importance in Breisgau-Hochschwarzwald's transition to RESS. While other utilities were also mentioned (EnBW and sub company EnergieDienst), Badenova stood out to be of particular importance. Different to the classical concept of an energy utility which only provides energy to its customers, Badenova is active in a range of fields. One interview partner referred to Badenova's funding scheme "innovation fund", which can be accessed by actors who want to implement pioneering RE measures. As mentioned earlier, the utility also provides funding for other projects such as the (now completed) project "Bioenergiedörfer am Start" which helped one Breisgau-Hochschwarzwald community, Breithau, to already achieve RESS: Another field of action of Badenova is consulting local or regional administrations as well as individuals or groups from civil society in the realm of climate protection concepts and RESS. As described by one interview partner, Badenova offered active support in the formation of a citizens' energy cooperative, which led to the formation of a community energy grid in Breithau. He stated that although some citizens have difficulties understanding the concept of "*an energy provider helping citizens to become energy self-sufficient and thereby digging its own grave*" (IP6: 89) the partnership between Badenova and the community has been advantageous.

A collection of key actors belonging to the actors' group 'civil society' are combined under **citizens' energy cooperatives**. Citizens' energy initiatives are active in the fields of implementing local RE projects, thereby involving local actors and ensuring that financial benefits stay close to home. Interview partners referred to both individual energy cooperatives

from specific communities (St. Peter, Breitnau, St. Märgen, Löffingen, Dreisam Valley, Lenzkirch, Kirchzarten, Staufen, Buchenbach, and Bonndorf) as well as to citizens' energy cooperatives in general. St. Peter was especially emphasized by most interview partners and was seen as an important key actor. An interview with the representative of the citizens' cooperative did not take place, however, due to time restrictions on side of the interview partner. Another cooperative that was highlighted by interview partners was Breitnau, for which an interview was carried out with the responsible person from the citizens' energy cooperative. St. Peter and Breitnau seem to hold a central role among the citizens' energy cooperatives in Breisgau-Hochschwarzwald and are explained in more detail below. One interview partner stated that he is aware of citizens' initiatives being active in selective communities but that he had no overview about the specific groups. Other interview partners confirmed that more and more energy cooperatives are being founded in the district Breisgau-Hochschwarzwald, many of which *“having started off with a focus on solar energy and now searching for new lines of action”* (IP2: 101). One example for citizens' involvement was given in the case of Titisee-Neustadt, where a municipal utility with public participation was jointly founded by the town administration and green energy utility Elektrizitätswerke Schönau (EWS) to buy back its electricity grid.

Several communities were listed by interview partners as key actors in Breisgau-Hochschwarzwald. To focus on key actors, the communities of **St. Peter** and **Breitnau** were identified as key players and are introduced in more detail in the following. The community of St. Peter was repeatedly mentioned as a key actor by almost all interview partners. The two individuals who were identified as the driving force behind the community's efforts to RESS were the town's mayor and the citizens' district heating cooperative. St. Peter was seen as a pioneer by most interview partners. Some referred to it not only as a good example of a town reaching RESS, but also as a valuable partner to ask for advice in the planning and implementation processes of RE projects. Another aspect that was specified to support St. Peter's role as key actor is its prominence as a wind energy site. Another key actor that was identified is the community of Breitnau. Similarly to St. Peter, interview partners referred to the village's mayor and the energy cooperative as the key actors. Breitnau participated in the program 'Bioenergiedörfer am Start' carried out by Naturpark Südschwarzwald and co-funded by Badenova, which led to the creation of the citizens' energy cooperative. Besides establishing a district heating system that supplies the community, Breitnau has been known for erecting the first wind turbine in state Baden-Württemberg in 1992. Further activities include the widespread use of solar energy on the large roofs of farm building, hydropower stations and bioenergy plants.

It has proven difficult to identify the role that the **district administration of Breisgau-Hochschwarzwald** currently holds. This is due to the following reason: while many interview partners referred to the district administration as one of the most significant key actors in theory, in practice the administration has only recently committed to setting a RESS target. The interview partners acknowledged a substantial potential in the role that the district administration plays once it starts becoming more active in RESS-related activities, but it currently is not considered as a driving force in the transition to RESS in Breisgau-Hochschwarzwald.

Nevertheless, in the context of the research the district administration is considered as a key actor, which is yet to fulfil its role in the implementation of RESS activities.

Key actors that were identified from the field of private economy, again not as individuals but as a societal group, are the **farmers** in Breisgau-Hochschwarzwald. Their fields of activities are the provision and usage of RE, e.g. bioenergy through agricultural waste or forestry, solar energy installed on large roofs of farm buildings and a few singular wind farms (e.g. St. Peter, Breitnau).

*“[...] Farmers, of course, they are the energy producers par excellence, who either self-sustain their own farmsteads, or contribute through the provision of biogas, or through the installation of PV system on their roofs” (IP6: 239)<sup>7</sup>*

As explained by several interview partners, the farmers in the district possess an awareness of the financial benefits of RESS, having realised that the usage of RE can provide a second stream of income and secure the subsistence of their agricultural activities. Another key actor from private economy named by interview partners was the planning agency **Zelsius**. Although referred to by only two interview partners, it became clear that Zelsius is involved in a lot of RE projects in the region.

*“But somebody has to initiate [RE projects], and ultimately carry them out, and if I think about St. Peter, St. Märgen and Breitnau, and if I think further direction Bahr, Löffingen, it is the same planner as ours, Zelsius; Löffingen, Ewatingen, Breitnau, that is all covered by our planner” (IP7: 258)<sup>8</sup>*

It was also stated that the planning agency is in the process of starting a cooperation with Badenova, emphasizing the key role that both businesses play in Breisgau-Hochschwarzwald.

Finally, the regional **banks** Sparkasse and Volksbank were identified as key actors. The financial institutions act in two main fields: supporting projects through investments and funding, and providing loans, either bank-owned loans or federal loans administered through the bank. As explained by one interview partner, it is important to have a committed bank as a partner, as they “need to show flexibility at times” (IP7, Z.25f), e.g. if a RE project faces difficulties in terms of timescale or implementation of measures.

Figure 3 illustrates the here described network of key actors. In this diagram, the interview partners are indicated by a red circle and the actors they referred to by a blue square. The size of the square represents the importance of the actor and the arrows indicate the actors that interview partners referred to.

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<sup>7</sup> Original citation: „[...] Landwirte klar, logisch, das sind im Grunde ja die Energiewirte schlechthin, die entweder in Eigenversorgung ihre Höfe versorgen, oder eben über den Betrieb von Biogasanlagen dann ihren Beitrag dazu leisten, oder über die Installation von PV Anlagen auf den Dächern.“ (IP6: 239)

<sup>8</sup> Original citation: „Aber trotzdem muss es ja jemand initiieren, und letztendlich auch durchziehen, und wenn ich jetzt an St. Peter, St. Märgen und Breitnau denke, dann wenn ich mal weiterdenke Richtung Bahr, Löffingen, das ist der selbe Planer wie unserer, Zelsius, Löffingen, Ewatingen, Breitnau, also das macht alles unser Planer.“ (IP7: 258)

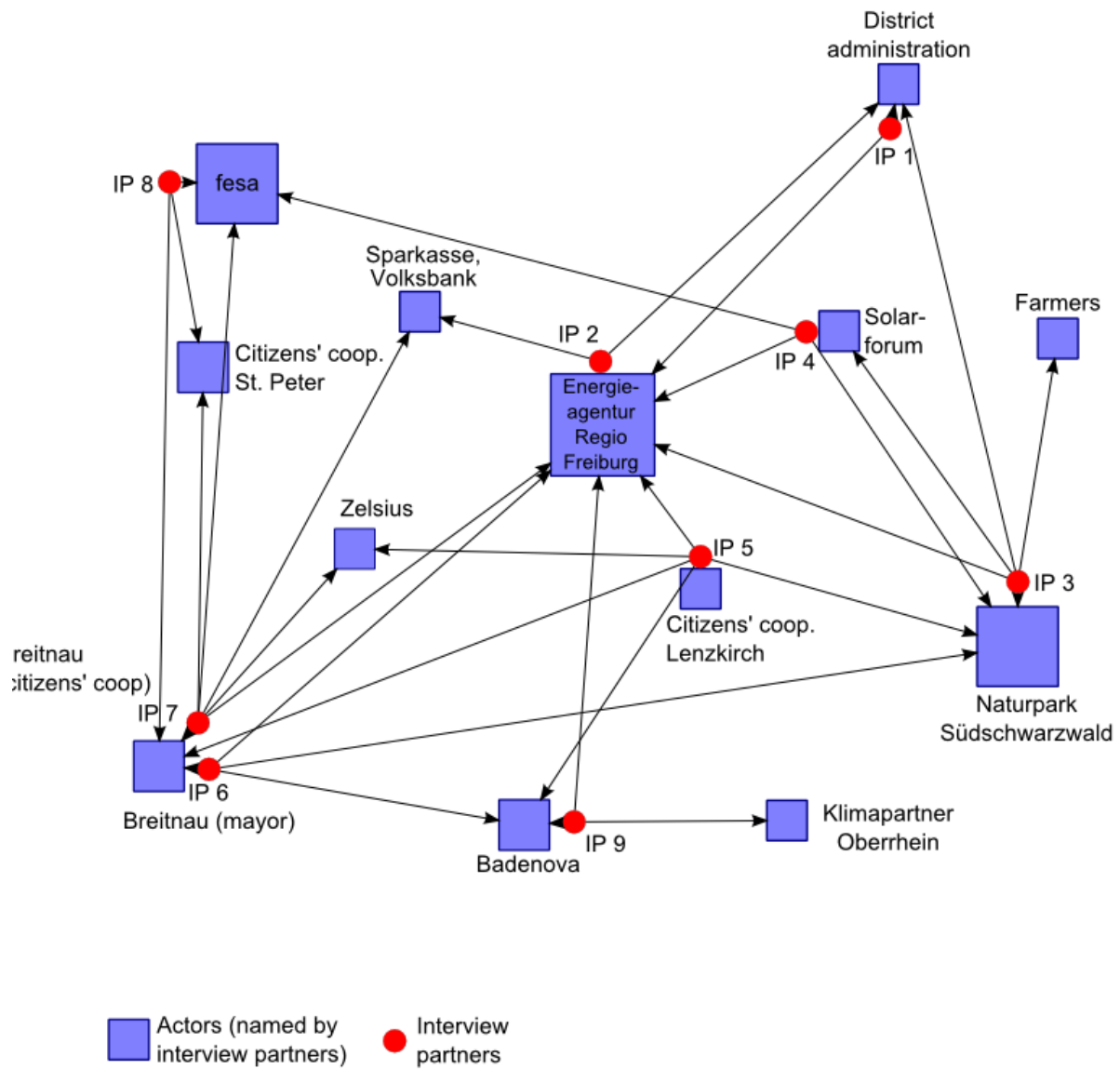


Figure 3: Network of key actors in Breisgau-Hochschwarzwald (own design)

#### 4.2.2. Interactions of the key actors

##### Reasons for interactions

To gain a better understanding of the network of key actors (Figure 3), the interview partners were asked why they interact with the key actors they referred to and how the exchange between them takes place. In their answers, they referred to both the key actors they had previously listed, as well as other involved actors. Therefore, and due to the different backgrounds of the interview partners, (i.e. political-administrative, private economy and civil society) the purposes of their interactions varied. It was possible, however, to detect predominant topics of exchange for the interview partners as presented in Table 9.

**Table 9: Predominant topics of interaction as stated by interview partners (own design)**

Predominant topic of exchange	Background of interview partner
strategic planning	political-administrative
project-related issues / problems	private economy, civil society
support for citizens and communities: funding and training	civil society
exchange of experience and knowledge	civil society
how to improve the political-administrative framework	private economy

One interview partner, representing the district administration, stated that his exchange took place with other actors on administrative level and that the topic of their exchange was planning the next steps in the realisation of the commitment made by setting the 2050-target.

*“Well, for us the question was always at the focus as ‘how to we proceed with this topic, which duties do we have to fulfil with regard to the commitment [the 2050 target] made by Region Freiburg, [...]?’” (IP1: 230)<sup>9</sup>*

He further stated that in the following year, he expects collaborating with Energieagentur Regio Freiburg, as they will consult the district administration in the process of the EEA. It stood out that no exchange with other actors is currently taking place besides the contact to the administrative level and Energieagentur Freiburg.

Another interview partner with a political background as political decision maker of a pioneer community in Breisgau-Hochschwarzwald also described strategic planning of next steps towards RESS, yet in exchange with actors from the communities’ citizens’ energy cooperative. Apart from strategic planning, he also specified to discuss RE project-related issues in his exchange with other actors.

*“[The topics of exchange are] cooperative-related issues, of course. Running the district heating system naturally is one of our key issues, to support it and to find future business areas for the cooperative” (IP6: 282)<sup>10</sup>*

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<sup>9</sup> Original citation: „Also bei uns stand immer im Vordergrund die Frage wie machen wir mit dem Thema weiter, welche Verpflichtungen haben wir gegenüber dem Beschluss der Region Freiburg,[...]“ (IP1: 230)

The interview partners from private economy described project-related issues in their interaction with those actors that were actively planning or implementing RE projects. Another interview partner stated that in his exchange with other actors the questions how to drive the idea of RESS forward and how to improve the administrative system, i.e. accelerating and simplifying planning application processes for RE projects, are of central importance.

*“Basically, the topics are always the same: how can the energy provision be developed in the long-term, how can planning permission processes be optimised, how can we involve citizens in this process? [...]. We also try to drive things forward here politically.” (IP9: 135)<sup>11</sup>*

While political-administrative interview partners focussed on strategic planning topics, the reasons for exchange for civil society actors were predominantly aimed at either supporting other civil society actors or gain knowledge from the experience of others. In their communication with other actors, the associations Naturpark Südschwarzwald and fesa e.V. provide support for citizens (individuals or citizens’ groups) or communities through information, training, and funding. Both interview partners representing the organisations emphasize here, that they aim to support local actors by *“helping people to help themselves”* (IP8: 225). Another aspect was the improvement of communication between various involved actors.

The main topics of exchange for interview partners representing citizens’ energy cooperatives were exchange of knowledge and experience in matters related to specific RE projects or the running of a citizens’ cooperative. One interview partner stated that his exchange with other actors was focussed on the questions how to realise a district heating system, to learn from more experienced actors and, through this exchange, to obtain decision-making support. Another interview partner explained that due to the typically voluntary background of citizens’ cooperatives, actors do not have the time or resources to keep up to date with changes in the legislative framework therefore exchange with other actors provides an opportunity to obtain information.

*“Or the continuous changes [in the legislative framework]: not everybody has enough time to acquaint themselves with all the details, which is due to the voluntary occupation, therefore you can easily obtain the information at network meetings” (IP7: 421)<sup>12</sup>*

All in all, the exchange is characterised by exchanging knowledge and asking for advice on practical problems.

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<sup>10</sup> Original citation: „Ja gut über genossenschaftliche Themen natürlich. Der Betrieb der Nahwärmeversorgung ist natürlich unser Hauptthema dort, das entsprechend dort zu begleiten und zu betreiben.“ (IP6: 282)

<sup>11</sup> Original citation: „Im Grunde geht’s immer um dasselbe, wie kann man die Energieversorgung zukunftsträchtig ausbauen, wie kann man die Genehmigungsverfahren optimieren, kürzen, wie kann man auch die Bürger miteinbeziehen in diesen Prozess. [...]wir versuchen auch die Dinge hier politisch voranzutreiben.“ (IP9: 135)

<sup>12</sup> Original citation: „Oder die laufenden Veränderungen, wo eben nicht jeder Zeit hat, das hängt wieder mit der Nebentätigkeit oder der ehrenamtlichen Tätigkeit zusammen, Zeit hat sich so einzulesen, sich einzuarbeiten, der holt sich dann einfach die Informationen bei solchen Netzwerktreffen.“ (IP7: 421)

## Mode and intensity of exchange

After understanding who the key actors are and why they interact with each other, the last question that remains open is the mode and intensity of exchange. Essentially, there is not one favoured mode of exchange, but rather depending on the issue they are dealing with the interview partners use different types of communication: emails, websites and internet, phone calls, personal meetings, formal proceedings, conferences, and events.

Again differences arose between the different types of interview partners. The political-administrative actors predominantly interact with other actors through formal sessions and board meetings. These usually take place between two to four times per year. Interview partners from civil society and private economy in contrast interact with other actors in a more informal setting and according to the situational circumstances. Emails and phone calls were described as most frequent during times of high activities related to the planning and implementation of RE projects. Websites and internet platforms were also mentioned as a way of regularly exchanging information. Besides phone calls and emails, personal meetings were also described as important, although naturally they do not take place as often. Personal exchange takes place in individual meetings, which are usually described as spontaneous, and at organised network meetings or various other scheduled events. Network meetings, which are organised by fesa e.V. and are not limited to the district boundary of Breisgau-Hochschwarzwald take place around twice per year. Other events take place on an irregular basis, and the participating actors vary. During the analysis it became clear that while email and phone calls represent the most frequent mode of exchange, personal meetings and events with multiple actors are vital for the exchange of knowledge and the building of a network of actors. Altogether it was stated that the intensity of exchange varies. It is greatest during project planning and implementation phases, the intensity of exchange is greatest due to the need to gain information and organise concrete measures.

### **4.3. What obstacles do the actors face?**

To find out more about the problems that arise in the starting phases of regional transitions to RESS, interview partners were asked what obstacles they face within their involvement in the topic in Breisgau-Hochschwarzwald. The problems that interview partners indicated varied, which is not surprising in light of their different functions in the field of RESS (as discussed in chapter 5). To gain a better overview of the issues they have to face, the following areas of problems were derived, as will be explained in this chapter (see Table 10):

**Table 10: Areas of problems faced by actors in Breisgau-Hochschwarzwald (own design)**

communication and cooperation
statutory framework and wider context
levels of responsibility
internal barriers
practical problems
honorary involvement

One important field in which problems arise is **communication and cooperation** between actors. This is reflected in all the other obstacles discussed in this chapter and therefore deserves to be dealt with distinctively. There is a variety of factors that cause difficulties in the communication and cooperation between actors, which in turn leads to more diverse problems. One factor that was described by interview partners is the difficulty of motivating citizens to get involved in RESS related activities because they feel insecure, e.g. through changes in the EEG or a negative-discussion about wind energy in the region. Further, alienation of citizens from the topic of RESS through the media was described to further exacerbate the already difficult task of motivating a wide range of citizens from all walks of life.

*“[...] problems lie in the field of motivation of citizens, actors, who of course are made feeling insecure by the discussion, e.g. now through the current EEG amendments.” (IP2: 57)<sup>13</sup>*

Another interview partner stated that an excess of information regarding RESS is available to the public, including opposing views and contradictory statements. Here again, communication between actors, and between actors and the public is crucial to convey the common goal, thus to get people involved. One area in which cooperation was described as a problem is the coordination of all involved actors in specific RE projects, with focus on the suppliers and craftspeople who need to work together across their various trades. It was also described that the missing communication between the community level and individual citizens can lead to problematic effects, particularly lessening the motivation of people to get involved:

*“Often the communities do not know how to motivate and involve the citizens, and in turn citizens who are interested in getting involved are overlooked and regarded as not competent.” (IP8: 123)<sup>14</sup>*

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<sup>13</sup> Original citation: „[...] sind es vor Allem auch immer wieder Probleme im Aufgabenbereich Motivation von Bürgern, Akteuren, die sich natürlich verunsichern lassen durch die Diskussion, wie z.B. jetzt durch die EEG-Novelle.“ (IP2: 57)

<sup>14</sup> Original citation: „Die Kommunen wissen sehr oft nicht, wie sie ihre Bürger einerseits motivieren, beteiligen sollen, umgekehrt die Bürger sind interessiert an Beteiligung, werden aber sehr oft übergangen, und als nicht kompetent wahrgenommen.“ (IP8: 123)



Various interview partners from across the range of different backgrounds described problems related to the **statutory framework and wider context**. While the technologies for the different RE applications are readily available, legislative rules and restrictions can hinder the development of these projects. A predominant factor are the changes in the EEG, through which feed-in-tariffs and funding opportunities for private, small to medium scale RE plants have been reduced. This resulted in greater financial burdens for those planning to carry out decentralised RE projects. Furthermore, the “*decline in incentives and the tightening of regulations result in long-term planning becoming unreliable*” (IP4: 187). This in turn was described to cause a wide-ranging uncertainty about the viability of RE for the public as well as for investors.

Other interview partners stated that regulations in federal landscape-, biodiversity- and environmental legislation as well as constraints determined by the regional planning authorities slow down planning applications and can even prohibit the development of RE projects. This is of special importance in the hydropower and wind energy sector, where technically feasible sites are blocked through environmental legislation, which is interpreted by the regional planning authorities in a strict manner.

*“The problems we are facing are related to the political-economic framework, at the moment very prominently in the development of wind energy [...] where landscape protection is valued higher than climate protection”* (IP2: 46)<sup>15</sup>

As described by one interview partner, the time-scale of the RESS target poses a problem in itself.

*“The idea and the result lie very far apart when we are working with a planning horizon aiming at 2050, this is extremely difficult. [Many people] do not follow this process because they simply do not see its effect”* (IP3: 77)<sup>16</sup>

Another obstacle that was described lies in the different **levels of responsibility**. It was described by interview partners from the district level, private economy and civil society alike that it is difficult to break down the overarching target for the district to reach RESS by 2050 into practical measures at community level. The district administration holds that it has only little executing power because the communities are responsible for their own actions. Furthermore, at this point in time the topic of RESS is not organised centrally within the district administration. This explains why other interview partners describe a lack of commitment and involvement at district level. Besides the lack of organisation at district level, it was stated that gaining planning permissions is a lengthy process, at municipal and district level alike.

Other interview partners explain a hindering factor as the lack of interest by politicians. While individual actors from civil society and private economy are striving to realise RE ideas, there is

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<sup>15</sup> Original citation: „Die Probleme, mit denen wir uns befassen die betreffen einerseits die politisch-wirtschaftlichen Rahmenbedingungen. Sprich sowas wie, wenn um den, ganz prominent natürlich im Moment, den Ausbau von Windkraft geht.“ (IP2: 46)

<sup>16</sup> Original citation: „... Also die Idee und der Effekt der am Ende steht sind relativ weit auseinander und mit Handlungszeiträumen 2050 zu arbeiten, das ist eigentlich extrem schwierig.“ (IP3: 77)

only little or no appreciation of these efforts at the administrative levels, again both at community and district level.

*“The district administration could initiate [action] by acknowledging and specifically accrediting those pioneers or actors, that are involved in climate protection measures. Also the politicians [should] realise that climate protection is a joint task that is not restricted to the administrative levels [...]” (IP8: 286)<sup>17</sup>*

A range of obstacles described by interview partners were classed as **internal barriers**. Resistance through groups opposing wind energy or corn as biomass feedstock for landscape and nature conservation reasons were described to slow the process of RESS down. Another example is the town of Staufen, which was described by some interview partners as a RESS pioneer, yet is facing problems because many buildings are damaged caused by misapplication of geothermal energy. This in turn has had knock-on effects on the public image of geothermal applications in the region, thus resulting in a barrier to develop this technology in Breisgau-Hochschwarzwald (IP8: 108). Lastly, a barrier that was described appears when external energy suppliers enter a community to install RE projects. Here, citizens often oppose developments such as district heating systems because external companies gain profits and the local inhabitants do not benefit from the projects.

The interview partners specified a range of **practical problems**. One interview partner considers the required reduction in energy consumption (set out in the potential analysis upon which the 2050 target is based) as unrealistic. In the application of RE projects such as district heating systems, the dispersed settlement structure in many parts of Breisgau-Hochschwarzwald was named as hindering factor. Another interview partner stated that through the designation of state-owned woodland as FSC-certified woodland, the amounts of wood to be used for bioenergy purposes have decreased. Financing RE projects and especially raising money to cover up-front costs was stated as an obstacle by various interview partners. Sufficient funding being of critical importance for any RE related project, this issue has become more severe through the changes in EEG as described earlier.

Lastly, one crucial problem that the actors involved in citizens' cooperatives are facing is the fact that they are usually working in an **honorary capacity**. Inherently, this voluntary engagement brings with it intense burdens on the actors who need to invest private time, often while working in full-time employment. Furthermore, for actors that are able to work on RE projects only after-hours or during weekends, there is the added difficulty of reaching contact persons at local authorities and private businesses during office hours. Another aspect of voluntary engagement is that the involved actors are usually new to the many aspects involved in planning and implementing a RE project. These range from the technical knowledge to financial management and obtaining funds to involving other actors. All these factors lead to lengthy processes and

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<sup>17</sup> Original citation: „Und dann könnte der Kreis natürlich auch aus meiner Perspektive Sachen anstoßen, die so Pioniere oder Akteure im Klimaschutz, die vor Ort unterwegs sind auch anzuerkennen, ganz klar zu würdigen. Also auch die Kreispolitiker auch, ganz klar zu sehen, dass Klimaschutz auch eine Gemeinschaftsaufgabe ist, und nicht nur auf Verwaltungsebene beschränkt ist“ (IP8: 286)

actors being demotivated, not ready to get involved or to stop their involvement in RESS-related activities.

*“This is a very important aspect: to support local actors; because when local actors drop out, then we lose people who actively engage in climate protection, thus we are not able to fulfil our targets. And this not only in the development of RE, also in the field of mobility, building efficiency; once these actors are removed, they are not going to be ready to get involved again, and then the community will have a lot of difficulties in reaching their [RE] targets” (IP8: 139)<sup>18</sup>*

## 4.4. Success factors

### 4.4.1. Appraisal of success factors in Breisgau-Hochschwarzwald

To recap, the success factors from ‘best-practice’ regions identified in the literature are self-ownership and community participation, support through political and financial framework, cooperation on and between levels, communication and transparency, visits to / from pioneers, external factors, motivation, and regional added value.

Self-ownership and community participation

During data analysis it was found that in Breisgau-Hochschwarzwald the success factor of self-ownership of RE projects and community participation is partly fulfilled. It is characteristic for the district that several of its 50 communities’ are pursuing community-led RESS measures, while others are not active. Communities with active citizen participation are shown in Table 11.

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<sup>18</sup> Original citation: „Und das ist ein ganz wichtiger Punkt: Akteure vor Ort zu unterstützen, wenn die Bürger, also das Problem was wir im RegioNetz auch sehen, wenn quasi die Bürger ausfallen und marginalisiert werden und an den Rand gedrängt werden von der Energiewende, dann verlieren wir aber Leute, die sich im Klimaschutz engagieren, und dann können auch keine Klimaschutzziele umgesetzt werden. Und dann kann man das auch vergessen, also nicht nur im Ausbau EE, sondern dann werden die Leute auch demotiviert im Handlungsfeld Klimaschutz in der Mobilität, im Gebäudeeffizienzbereich, also wenn die einmal wegfallen als Akteur, dann kriegt man die auch nicht mehr mobilisiert, und dann hat die Gemeinde Mobilisierungsprobleme und dann hat Probleme, Klimaschutzziele umzusetzen.“ (IP8: 139)

**Table 11: Communities in Breisgau-Hochschwarzwald with community participation (own design)**

St. Peter
St. Märgen
Breitnau
Löffingen
Staufen
Kirchzarten
Buchenbach
Lenzkirch
Titisee-Neustadt
Bonndorf
Ehrenkirchen
Glottertal
Gundelfingen
Münstertal
March

In most cases, the self-ownership and community participation is realized through citizens' energy initiatives. Citizens' energy cooperatives are managing RE projects in the communities listed in Table 11. Furthermore, there are several other citizen groups such as Solarforum Hochschwarzwald or Bürgerenergie (Citizens' Energy) Dreisamtal. The success factor is therefore classed as partly fulfilled.

#### Support through political and financial framework

A political and financial framework in Breisgau-Hochschwarzwald to support RESS measures is currently not in place. The 2050-target set by the district administration in conjunction with Region Freiburg is currently the only commitment made at district level. Currently, there are no means of strengthening this idea directly at the district level through legislative regulation or financial incentives. A program that the district administration is offering is 'ECOfit', an education program for consolidated companies to improve their environmental footprint. This program, however, was described as a "low-threshold initiative" and is by itself not enough to foster RESS measures in the region (IP1: 20). Meanwhile, there are other supporting programs in place, such as "Energy Region Southern Black Forest, administered by Energieagentur Regio Freiburg, Naturpark Südschwarzwald, Badenova and other partners. This program, funded by the state Baden-Württemberg, offers financial or advisory support for RE projects. Although not limited to Breisgau-Hochschwarzwald, the initiative plays an important role in providing assistance for RESS related activities in the district. Political backing of RESS again can be found dispersed across Breisgau-Hochschwarzwald, in selective communities where a committed political decision maker or member of administration is driving the idea forward. In these cases, the communities benefit from increased commitment towards the realisation of RE projects. Yet there is no overall strategy or platform, through which the RESS target is unified and advocated to involve all of the 50 communities.

## Cooperation on and between levels

As described in the previous chapter, there is a lack of cooperation on and between the different levels of administration and citizen level in Breisgau-Hochschwarzwald. Firstly, the topic of RESS at district administration level is currently not comprehensively managed and a responsible person or group is missing. Naturally, this leads to shortcomings in the cooperation between this upper level of administration and the respective local administrations of the communities within the district as the topic of RESS not being dealt with at district level cannot be conveyed through the hierarchy to the particular municipalities. There is however, cooperation within levels, as it was shown that actors from different communities in the district exchange ideas and knowledge. On the lower hierarchical levels, involving municipalities, citizens and private companies, cooperation is in place and currently even driving the RESS process forward independently from the top level of the district administration. There is, furthermore, exchange with pioneers from other regions which aids in the development of RE ideas and projects. What is missing is a proactive approach by the district administration to develop the topic (at the same level), and to collaborate with actors from other levels.

## Communication and transparency

It turned out that half of the interview partners had not been informed about the 2050 target set by the district administration, demonstrating that it was not communicated successfully. More so, those interview partners that had knowledge of the target at the time of the interviews predominantly had come to know about it through bodies different to the administration. This shows that communication and transparency of the RESS target are not sufficiently executed at the district level. Communication between the involved actors happens mainly through personal exchange in meetings and conferences or emails and phone calls. Thus, exchange of knowledge takes place between the various involved actors. During the interviews there was no indication, however, as to how thoroughly the idea of RESS is presented to the public. This leaves the success factor of communication and transparency fulfilled only in part.

## Visits to / from pioneers

Several interview partners described visits to pioneers in Germany and Austria as a valued experience, to both gain practical knowledge about RE projects as well as to educate and motivate actors about the opportunities of RESS. These visits to other pioneers were carried out by actors from several communities within Breisgau-Hochschwarzwald. Therefore, the success factor is fulfilled and with the potential to be extended to more communities in the district getting in contact with pioneers from other regions.

## Regional added value and development

During the interview analysis it turned out that, although playing an important role, regional added value was not specified as the main driving force for all actors to get involved in RESS related activities. Regional added value as a motivator for RE projects can be found in the involvement of farmers in the district, who use solar energy as a means of generating more

income and reducing their energy expenditures. The idea of regional development and added value was not taken up by the district administration to reinforce RESS. It can, however, be used to show the added value of RESS not only from an ecological point of view but in light of the economic and social benefits that accompany it. This success factor is therefore not fulfilled and can be further exploited

#### External factors

External factors can drive or hinder the development of RESS. In the case of Breisgau-Hochschwarzwald, and likely in other regions also, changes in the EEG are posing problems to the development of RE projects, especially in the solar energy. This, however, means that actors need to find new areas of activities and new ways of funding. Although the RE regulation changes lead to insecurity of financial and idealistic commitment by actors, there are other factors that can be utilised to support the transition to RESS. One supporting external factor is the unstable price of oil in global markets and the resulting rises and fluctuations in energy prices. This gives incentive to actors to engage in efforts to achieve RESS. A common regional identity is present in the Black Forest Region, which also aids to drive the goal of a region that is producing its own energy. This common identity, however, is not used to its full potential although constituting a valuable asset.

Another external factor that was identified is the proximity of the district to “Green City Freiburg”. City of Freiburg is nationally and internationally renowned for its advanced status in matters related to climate protection and RE. This image has knock-on effects on the district Breisgau-Hochschwarzwald, by generating awareness of RE as well as drawing tourists to the region. Based on the assessment of these aspects, external factors are present in Breisgau-Hochschwarzwald which support the transition to RESS and can be utilised even further.

To summarise these findings, the success factors are reviewed in Table 12. The comparison of Breisgau-Hochschwarzwald to ‘best-practice’ cases shows that most success factors are only partly fulfilled. In two cases, the success factor was classified as fulfilled and in two other cases as not fulfilled. However, it should be noted that all success factors, including those that are fulfilled can be developed further.

**Table 12: Success factors in Breisgau-Hochschwarzwald (own design)**

Success factor	Fulfilled?	Explanation
Self-ownership and community participation	partly:	in specific communities
Support through political and financial framework	no:	lack of support from district administration, isolated support from particular actors
Cooperation on and between levels	partly:	lack of cooperation at district level
Communication and transparency	partly:	lack of communication and transparency at district level
Visits to / from other pioneers	yes:	to be extended to more communities
Motivation	partly	to be expanded to reach more actors
Regional added value and development	no	only rudimental, no strategy
External factors	yes	further utilisation of external factors possible

#### 4.4.2. Recommendations made by interview partners

During interview analysis it emerged that interview partners had clear ideas of factors that can drive the RESS transition in Breisgau-Hochschwarzwald forward and that are needed for a successful transition. Their recommendations point into the same direction as the success factors identified in the previous chapter and therefore the interview partners confirm the findings. Overall, interview partners a voiced request for a more **stringent execution of the RESS topic**, both at district level as well as broken down to community level. This involves a range of measures. Therefore, in addition to the success factors identified for Breisgau-Hochschwarzwald, the following section presents recommendations made by interview partners.

The most frequent suggestion made by various interview partners was the **appointment of central actors** who should serve to connect the individual actors and coordinate their actions. As described before, the currently involved actors strive to exchange their knowledge and benefit from learning from one another and from those with more experience than others. It was stated that at this point in time, more information and knowledge regarding RESS projects is present within the district boundary and should be made accessible for all those who are yet to get involved. It was suggested that a central contact point should be created within the various communities in Breisgau-Hochschwarzwald, as well as at district level. These contact points should firstly provide support to local actors and encourage cooperations between the political, private and citizen-based actors. Secondly, it should coordinate actors and synchronise their efforts across the levels (administration, community and individual level).

It was called for a **breakdown of the 2050 target** into smaller timeframes with 10-year subtargets, as well as into specific targets for the individual communities. It was recommended for the district administration to develop a comprehensive development plan with concrete measures for fulfilling the RESS target. The communities of Breisgau-Hochschwarzwald should

then develop their own specific development plans, setting out targets for the community based on the individual RE potentials. These development plans “can be brought together at district level to assess whether the actions will suffice to reach the 2050 target or not” (IP5: 264)<sup>19</sup>.

Another suggestion was to **signal political support** for both the idea of RESS and involved actors. Competition was proposed as a tool to encourage participation of the various communities. For example, one interview partner described a contest to be set out by the district administration to identify communities that are most active in the field of RESS (IP 8: 291). In this context, committed actors who are supporting RESS can be publicly rewarded for their achievements, thereby recognising their personal efforts and encouraging others to participate.

## 5. Discussion

### 5.1. Discussion of Results

The target

The target to reach RESS was set jointly by the administrations of district Breisgau-Hochschwarzwald and district Emmendingen and the City of Freiburg within the Region Freiburg. The motivation for the target, however, came from outside the district and the target is not perceived as binding from the district administration. This is reflected in the fact that from the political-administrative actors at district level, the topic has not been taken up and no clear strategy has been developed to pursue the RESS goal. In ‘regional governance’, the purpose and situational conditions described by Benz and Fürst (2003) state that the nature of the target has a strong impact on the likelihood for it to be achieved, and that a non-binding vision with no regulative support will result in limited commitment of actors. This notion can be confirmed as it was shown that those actors that are involved in RESS related activities are acting independently from the district administration and there is no cooperation between these levels. In the ‘phase model’ (Hauber and Ruppert-Winkel 2012) the importance of a political decision for RESS is also highlighted. Although in Breisgau-Hochschwarzwald the long-term RESS target has been set by the political incumbents, no action has followed this decision so far at the political level. While the ‘phase model’ describes political actors as present in the pioneer phase, Breisgau-Hochschwarzwald has a lack of these actors.

The fact that many of the key actors first heard about the RESS target or got involved with the RESS topic through Energieagentur Freiburg rather than through the district administration indicates that at district level the topic is not seen as a main priority. The lack of involvement by the district authority level may have detrimental effects on the success of the RESS transition because, as the overarching authority it has the power to initiate action towards its realisation. It

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<sup>19</sup> IP5: 264 - „Diese verschiedenen Masterpläne kann man ja dann auch wieder auf Kreisebene zusammenführen und sagen ‚Erreichen wir jetzt hiermit dieses Ziel oder erreichen wir es nicht‘.“



was also found that the scope of the RESS target in Breisgau-Hochschwarzwald represents a regional topic. Benz and Fürst (2003) state that regional topics are often instigated from the 'top down', yet the development of an overall regional concept is still missing. In contrast, selected communities within the district have taken up the topic of RESS individually and here the RE projects were planned and developed by citizens' cooperatives. This confirms the theory by Benz and Fürst 2003 that sectorial actions are usually carried out from the 'bottom up'. While a number of actors have been identified among civil society and private economy that are already involved in individual RE projects, the overall vision for the whole district to reach RESS can only be achieved when their actions are channelled and combined. In this effect, the district administration is in a crucial position to develop a comprehensive strategy so as to link the various actors already present and to involve those that have not entered the field of RESS in Breisgau-Hochschwarzwald yet.

### Key actors

The findings from Breisgau-Hochschwarzwald differ from the assumptions made by Benz and Fürst (2003), who state that regional cooperation in Germany is mainly carried out by collective actors. In the case of Breisgau-Hochschwarzwald, the actors that are most active, however, are individual actors. The classification of actors according to Benz and Fürst (2003) could still be found in the case of Breisgau-Hochschwarzwald. The individual actors act independently from the RESS target set at the regional administrative level and they do face problems related to funding as described by Benz and Fürst (2003). It was found that various key actors are involved in the topic of RESS in Breisgau-Hochschwarzwald. Nonetheless, actors from the political administrative level are underrepresented.

Classifying the district to a stage of its transition serves to allow for comparison with other case studies. When taking into account the 'best-practice' definitions of successful cases, it becomes clear that Breisgau-Hochschwarzwald does not fulfil the 'best-practice' criteria of an advanced stage in the implementation of measures. However, when considering that it is still at the very beginning of its transition there are overlaps with some of the criteria found by Sennekamp (2014). These are an early development of measures and an active involvement of pioneers. This notion confirms that firstly, Breisgau-Hochschwarzwald is in its initial phase of becoming self-sufficient and, secondly, there is potential for success when comparing it to successful examples from other regions. The 'phase model' showed to be applicable to the case of Breisgau-Hochschwarzwald and the district can be classified to the pioneer phase. It was found that in Breisgau-Hochschwarzwald political pioneers are by and large missing, thus the 'phase model' was a valuable tool to identify this lack and it points out the need for political incumbents. In their case studies, Hauber and Ruppert-Winkel (2012) found that political actors actively supported the idea of RESS in the region. In Breisgau-Hochschwarzwald this is not the case, but it was expressed by interview partners that this lack of commitment by the political-administrative side can be compensated for quickly once political incumbents start taking action. The study of Breisgau-Hochschwarzwald confirms the findings made by Hauber and Ruppert-Winkel (2012), namely that the involvement of political actors at the beginning of RESS

transitions are crucial to its further progress. Political and administrative actors are needed in emerging transitions because they are in a position from which they can set out a concrete and overall plan of action for the whole region, and also make available funds which are needed for the implementation of RE measures. The case of Breisgau-Hochschwarzwald shows that if political-administrative actors are not present, the movement towards the overall, regional goal does not gain momentum. Although there are individual actors present in several of the 50 communities in Breisgau-Hochschwarzwald, the political-administrative actors have the task of uniting their efforts and setting out a joint vision for the whole region.

### Interactions of actors

The results show that the actors present in Breisgau-Hochschwarzwald communicate within voluntary networks as voiced in the theory of 'regional governance' as described by Benz and Fürst (2003). It was found that cooperation between the actors in Breisgau-Hochschwarzwald takes place, yet only to a limited degree. This cooperation is mainly restricted to taking place within one hierarchical level, but not between levels. This means that the highest level, the district administration, is dealing with the topic of RESS almost exclusively with members of the district administration or the adjacent administrations of the City of Freiburg and district Emmendingen in the Region Freiburg. Actors from private economy and civil society in turn, cooperate and exchange information between each other, yet there is no vertical communication (i.e. with the higher administrative level of the district administration). 'Regional governance' is characterised by horizontal as well as vertical cooperation. Böcher et al. (2008) emphasize that regional actors' networks should represent the interests relevant for all actors in the region and that a horizontal cooperation beyond hierarchies is the baseline for successful implementation of development projects. In the case of Breisgau-Hochschwarzwald, this comprehensive cooperation is still missing. It is important to bring the different levels together because otherwise there will continue to be only singular, stand-alone projects or communities that are striving to achieve RESS. If the levels would continue to operate separately, it would be difficult to align their efforts along a common target. To fulfil RESS for the whole of Breisgau-Hochschwarzwald though, the district level needs to support the local actors and provide a common framework, which motivates all of its 50 communities to commit to RESS and to start taking action. In this way, problems that occur could be noticed and dealt with accordingly. Further, the cooperation between the levels would ensure that subtargets are set in an achievable way and the authorities would have a tool to measure the success of the transition along the way. The findings are in line with the theories of 'regional governance' and the 'phase model' in as they confirm that certain actor constellations are present at varying phases of a transition to RESS.

### Obstacles faced by the key actors in Breisgau-Hochschwarzwald

The obstacles faced by the key actors varied with their different backgrounds and functions. The described problems are reflected in the success factors from 'best-practice' cases. This means

that the obstacles described by the interview partners point out the shortfalls which, once successfully realised, turn into success factors that support the transition to RESS. A problem that was derived from the investigation of Breisgau-Hochschwarzwald is the honorary capacity of many of the actors from civil society. Although in the literature the involvement of actors from civil society, i.e. citizens' initiative was shown as success factor, it does not deal with the difficulties that the voluntary engagement brings with it. Therefore, this obstacle should be added to the list of success factors for successful transition to RESS, in that the engagement of key actors in an honorary capacity needs to be addressed in line with their financial and timely requirements.

### Success factors

The transition to RESS in Breisgau-Hochschwarzwald was compared to success factors from 'best-practice' cases. The success factors from the literature could be found in Breisgau-Hochschwarzwald through the interview analysis and it was found that they are in line with the factors described by Benz and Fürst (2003) in 'regional governance'. It turned out though that many success factors were only partly or not fulfilled, and those that are met can be developed further. This is not surprising because Breisgau-Hochschwarzwald is a starter region and the RESS process is still at its beginning. It needs to be considered that the 'starter' region Breisgau-Hochschwarzwald was compared to 'best-practice' examples, which means that it was not expected that all success factors would be fulfilled. The appraisal of success factors from successful regions, however, served to identify areas in which further action is needed.

The success factor self-ownership and community participation was found to be fulfilled in part in the district Breisgau-Hochschwarzwald. The RE projects that have been implemented within the district are run by citizens' cooperatives. This confirms the findings by many other authors who established that community ownership of RE systems is a crucial component of a successful RESS transition (e.g. Lovins and Klewer 1978; Dunn 1978; Hoffman and High-Pippert 2005; Walker 2008; Bomberg and McEwen 2012). The involvement of citizens and community ownership of RE projects, defined by Walker (2008) as a prerequisite for success is fulfilled in selected communities, such as St. Peter; Breitenau, and Löffingen. Communication and exchange takes place between actors through a range of media, i.e. phone calls and email, as well as personal meetings. It was found that personal meetings and conferences are the most important way of exchanging ideas and knowledge for the actors. To be aware of this success factor is particularly important because the organising of an exchange platform, i.e. regular meetings of involved actors in Breisgau-Hochschwarzwald should be a priority for the district.

The area of regional added value and development within the topic of RESS in Breisgau-Hochschwarzwald is present only rudimentary. That means that although the already realised RE projects carried out in conjunction with regional enterprises and thereby aiding the regional economy, the potentials for regional development and economic stimulation are not publicly recognised. In other studies, regional value creation was found as a main driver for the RESS transition (Hauber and Ruppert-Winkel, 2012). It is important for the district administration to

acknowledge these benefits as they can also serve to create a common vision for the district and to encourage actors to get involved (Müller et al. 2011). Because of the changes in the federal legislative framework, i.e. the EEG, it is even more important to recognise the added value that RESS can bring to regional development.

It was further shown that the recommendations for the future made by interview partners reflect the current success factors. While the recommendations are in line with the success factors identified in Breisgau-Hochschwarzwald and pose no new insights, they are valuable in that they emphasize what success factors are needed most from an 'insider' point of view. The call for a more stringent execution of the topic at district level by the political actors thereby corresponds to the findings with regard to the descriptions of the 'phase model' and 'regional governance'.

#### Focus of the work: the role of key actors

A large number of actors were identified through the interviews in Breisgau-Hochschwarzwald from which 14 key actors were deducted. The role of these key actors in the district is to stimulate action and implement RE projects in the RE transition, which is in line with the assumptions made by Benz and Fürst (2003). The key actors were found to be of central importance to the district's transition to RESS because they are characterised by a high level of motivation and a pragmatic approach. It turned out that although certain key actors were identified, not all of them are actively involved. This holds true for the political-administrative actors at the district level, who play a crucial role in the fulfilment of the RESS target. Until now, the key actors in Breisgau-Hochschwarzwald have been involved in RESS related activities on their own accord and independently from the district administration. For the overall district target to reach RESS by 2050, a commitment by the political administrative actors is needed. This reflects the theoretical considerations of 'regional governance', the 'phase model' as well as the success factors from 'best-practice' regions, in all of which political involvement and support is seen as a prerequisite for a successful transition. The fact is found in the empirical results in which the interview partners identify the actors group 'political actors' as central to reaching the RESS target, yet that an involvement of this group is still missing. It can be assumed that the key actors are responsible for the RESS efforts that have been implemented to date and therefore play a central role in the district's transition. Nevertheless, the large number of identified actors shows that not only the key actors are important, but also a broad range of other involved actors, such as the wider public. Hints were made by the interview partners to the acceptance of RE projects through the public the more involved they are in decision making processes. Also, projects can be impeded when opposition forms among the public. While the focus of this investigation was on key actors, it would be interesting to learn more about the significance of other actors and how they influence regional transitions to RESS.

## 5.2. Discussion of applied research design and methods

Choosing Breisgau-Hochschwarzwald as a case study has proven to be beneficial to answering the research questions. This is because firstly, it is a region at the beginning of its RESS transition and provided valuable insights into the situation of such regions. Secondly, due to its closeness to the City of Freiburg and district Emmendingen, it was possible to directly compare it to regions from the same cultural setting. The comparison that was carried out did not go into further detail, because it would have meant shifting away from the focus of the research. This leaves room for further research. Even through the City of Freiburg as a city administration cannot be directly compared to an administrative district, the findings could be adapted and put into the regional context.

By interviewing those actors that were referred to by other key actors, the choice of interview partners represents the actual network of key actors in the district. It further ensured that the data that was obtained represented the current state of the RESS transition in the district. Before the data collection commenced, actors' groups were established based on literature (politics and administration, private economy, and civil society actors) and at least one actor from each group was interviewed. This helped to ensure that actors from all groups were represented in this study and their opinions and experiences reflected. The decision to carry out personal, in depth-interviews brought with it benefits, but also restrictions for this study. Because the interviews were carried out in a relaxed and friendly atmosphere, the interview partners were willing to talk openly. Another advantage was that valuable information was often expressed after the official interview was finished and the voice recorder was switched off. This behaviour is also described in the literature (e.g. Przyborski and Wohlrab-Sahr 2014).

It remains open what effect the small number of conducted interviews has on the obtained results. Not all of the 14 identified key actors were available in the time frame of data collection due to interview partner's time constraints and because some of them were identified after the interview phase was completed. Although the information obtained through these interviews is sufficient to draw a comprehensive picture of the situation of actors in the RESS transition in Breisgau-Hochschwarzwald, ideally more interviews could have been carried out. Because of this omission, not all key actors (illustrated in Figure 2 and Figure 3) were interviewed, resulting in a gap in knowledge. Furthermore, it should be noted that besides the number of interviews ideally would have been larger to gain more insights, actors from further backgrounds should have been included. Key actors from private industry in Breisgau-Hochschwarzwald, such as farmers, banks (Sparkasse and Volksbank) and private business (planning office Zelsius) were not interviewed and their opinions and knowledge could not be incorporated in this research. With regards to the topic of regional development and regional added value, it would have been of particular interest to obtain information from the point of views of the regional farmers and private businesses. It is desirable in future research to incorporate these actors types into the investigation to gain a more complete picture of the situation of the key actors.

## 6. Conclusions and Recommendations

In conclusion, this study led to the realisation of a number of findings about the role of key actors in emerging transitions to RESS and recommendations were drawn from both the empirical investigation as well as the comparison of these findings to the scientific theories. It was found that the key actors play a central role in the district's transition to RESS, even though their involvement so far has been independent from the district administration.

The investigation brought to light that the motivation for the RESS target in Breisgau-Hochschwarzwald came from outside the district. It was interesting to see that although it has committed itself to the target to reach RESS by 2050, the district administration has not yet taken up action to implementing measures for its realisation. Comparing to the district Emmendingen, it turned out that the neighbouring district currently is at a more advanced stage of its RESS transition. This can be attributed to its involvement in form of a climate protection concept and the assignment a climate protection manager. Although the target was instigated from outside the district, the motivation for the majority of key actors involved in RE projects within the district is intrinsic, meaning they are self-motivated and drive RESS projects forward independently from the district. This motivation presents a valuable asset which should be sustained by the district administration. It is therefore recommended for the district administration to support the already existing networks of active actors in the district and their activities should be coordinated and aligned across the district.

It was discovered that of the 14 key actors identified in Breisgau-Hochschwarzwald, the actors' groups private economy and civil society are dominant, and actors from politics and administration are underrepresented. In other studies, political actors were recognised as main drivers of the transition process to RESS. In Breisgau-Hochschwarzwald this is not the case and this represents the lack of progress in the region's transition so far. In contrast, there are several enthusiastic and committed key actors in the district that even have achieved RESS at the community level in some instances. An exploration into their network of collaboration showed that they gained vital support by exchanging knowledge and experiences in personal meetings, both individually and on conference-type meetings. It is therefore recommended for the district authority, as well as the political and administrative incumbents of the district's communities, to assign personnel to engage in the topic of RESS.

An assessment of obstacles that the key actors are facing showed that the main problems arise from lack of communication between levels (district level, community level and private economy / civil society level). Furthermore, the responsibilities of the different levels pose a problem, as the overall RESS target for the district Breisgau-Hochschwarzwald cannot be achieved if actors from the different levels do not cooperate and develop a comprehensive strategy. It would be advised to break down the 2050 target into smaller subtargets, namely 10-year working targets. Furthermore, time-scaled subtargets should be developed for the district's 50 communities. This would aid in the cooperation between the various levels as well as breaking the RESS target down into an actor-specific and achievable format. The voluntary engagement of most of the civil society actors, i.e. the members of the citizens' energy cooperatives that actively work to realise

RE projects within their communities, is another crucial obstacle. It brings with it time and financial restrictions, as well as diminished readiness to get involved. The civil society actors however were recognised as critical for the accomplishment of RE projects and RESS in some communities and therefore require to be supported. It is proposed that the district administration publicly recognise their commitment and achievement, thereby promoting the idea of RESS in other communities and motivating actors to stay involved and new ones to enter the field. Financial support is also a prerequisite, which should be made available from the administration, either through direct funding or the acquisition of federal subsidies which are available.

Comparing the district Breisgau-Hochschwarzwald to 'best-practice' regions offered that success factors leading to an effective transition to RESS are only partly fulfilled. Because Breisgau-Hochschwarzwald is a starter region, this finding was not surprising. Nevertheless, recognising the weaknesses allows drawing up strategies to implement measures to fulfil the success factors in the future. Two success factors stood out not to be existent at all in Breisgau-Hochschwarzwald: a supporting political and financial framework for the transition to RESS, as well as the concept of regional development. As described, the involvement of political-administrative actors in the RESS transition is still nearly undeveloped; therefore the lack of a political framework is not unexpected. It is necessary to address this shortfall and to develop a comprehensive program of action. In this connection, the topic of regional development can serve as additional endorsement because the development of its RE resources can generate income in the region as well as provide independence from external suppliers.

In terms of future research, the role of other actors besides the here investigated key actors in starter regions is of interest. It could be explored what role other actors play and how they can be incorporated into regional transitions to RESS from the early beginnings. Furthermore, the role of regional development and regional value creation through RESS remains to be explored. It would be interesting to find out how regional value creation can add to the transition in Breisgau-Hochschwarzwald and whether it plays a more prominent role in other starter regions, especially under the changed conditions of the new EEG. Future research should not be limited to the role of regional added value in emerging transitions to RESS, but also assess other starter regions in order to add to the findings of this study and help new regions success in their RESS transition. In addition to the case of Breisgau-Hochschwarzwald, it would be interesting to compare different cases of starter regions.

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## Appendix A) Interview guidelines (own design)

Interview [Datum, Uhrzeit]

[IP#, Name]

### Interview-Leitfaden

Einleitung: **Ziel der Untersuchung und Rolle des IP** („Ich möchte am Anfang nochmal kurz erklären, warum ich dieses Interview mit Ihnen führen möchte...“)  
**Datenschutzerklärung** („Was Sie mir erzählen wird vertraulich behandelt. Sollte Ihnen eine Frage unangenehm sein, brauchen Sie natürlich nicht zu antworten“)  
**Genehmigung zur Aufzeichnung** („Begründung: keine Informationen verlieren, präzise Auswertung, dem Gespräch besser widmen“)

#### Einleitungsfrage: Persönlicher Bezug

**1. Es geht um den Energiewendeprozess des Landkreises Breisgau-Hochschwarzwald (LK BH) hin zur Selbstversorgung mit erneuerbaren Energien(EE).- In welchem Rahmen sind Sie daran beteiligt?**

#### Zeitlicher Rahmen und Zielsetzung des LK BH zur Selbstversorgung mit EE

**2. Wie sind Sie (ist Ihre Institution) mit dem Thema erstmals in Berührung gekommen?**

(Wann war das?)

**3. Wie kam es in LK BH ganz konkret zu der Entscheidung des Ziels der EE Selbstversorgung bis 2050?**

(Wie kam der Zusammenschluss zu der Region Freiburg zustande?)

(Warum wurde es beschlossen: Wer genau hat das Ziel angeregt und wer hat es beschlossen? Kam die Motivation zum EE-Ziel von „innen“ (LK BH) oder von „außen“?)

**4. Gibt es Personen oder Organisationen im LK BH, die Pionierarbeit für die Selbstversorgung mit EE geleistet haben?**

(Firmen, Verwaltung, Organisationen, Bürger, Initiativen?)

**5. Welche Ziele zum Thema EE und Selbstversorgung wurden bisher erfolgreich erfüllt?**

(Haben sich inhaltliche Schwerpunkte verändert? Wenn ja, warum?)

**6. Welche Probleme sind bei dem Energiewendeprozess aufgetreten?**

(Warum?)

(Innerhalb ihres Tätigkeitsbereichs?)

(Gab / gibt es auch Probleme in der Kooperation mit anderen Akteuren?)

**7. Wie sehen Sie die Rolle des LK BH im Vergleich mit der Stadt Freiburg und dem LK Emmendingen?**

(Sehen Sie Freiburg schon weiter fortgeschritten, etwa in einer Vorreiterrolle? Warum?)

)

(Warum ist es im LK BH anders?)  
(Sehen Sie noch andere Regionen als Vorreiter?)  
(Ob und wie stehen Sie mit denen in Kontakt?)

#### Interaktionen mit anderen Akteuren

**8. Wie schätzen Sie das Thema Energiewende / Selbstversorgung mit EE innerhalb der Verwaltung des LK BH ein?**

(Das Thema umfasst ja verschiedene Ressorts in der Verwaltung, wie sehen Sie da die Vernetzung untereinander?)

**9. Wer sind die beteiligten Akteure (d.h. Organisationen oder Personen) im Landkreis Breisgau-Hochschwarzwald?**

(Wo sind sie aktiv?)

(Vgl. Liste von anderen Fallstudien: „Spielen diese Organisationen / Personen eine Rolle? Warum / warum nicht?)

**10. Nennen Sie bitte die 5 für ihre Arbeit zur Selbstversorgung wichtigsten Akteure, mit denen Sie in den letzten 6 Monaten zusammengearbeitet haben.**

(Wie/wo ist dieser jeweilige Akteur aktiv?)

**11. Über welche Themen findet ein Austausch mit anderen Akteuren im LKBH statt?**

**12. Warum kooperieren Sie mit anderen Akteuren?**

(Was ist der Grund für die Kooperation, z.B. Wissensaustausch?)

**13. Wie findet der Austausch zwischen Ihnen und anderen Akteuren statt?**

(Wie oft tauschen Sie sich mit anderen Akteuren aus?)

(Wie, z.B. E-Mail, Telefon, Treffen, ...?)

#### Abschluss des Interviews

**14. Wen sollte ich zu dem Thema noch befragen (und können Sie ggf. Kontakt herstellen)?**

**15. Gibt es Dokumente zum Thema Selbstversorgung mit EE im LK BH, die Sie mir für meine Auswertung zur Verfügung stellen können (bzw. können Sie mir sagen, wo solche Dokumente zu finden sind)?**

**16. Haben Sie noch etwas, das Sie ansprechen oder fragen möchten?**

Schluss:           **Danksagung**