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Regional Transition Fields - How adaptation and delimitation shape regional transition processes

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Regional Transition Fields- How adaptation and delimitation shape regional transition processes

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Abstract:

This paper explores the dynamics that result in the entrenched positions that can be empirically observed in regions in the context of energy transition. We conduct our analysis along the concept of strategic action fields. Thereby we develop 'Regional Transition Fields' (RTF) that encompass all actors, activities and organisations in a region that share the concern for the transition. This could be any kind of regional transition process, but in this paper, we focus on the regional energy transition. Hence, the actors' shared issue at stake is the future energy mix of the region. All actors that share this concern are considered to be part of the field. Our approach allows us to consider both those actors that promote an energy transition towards more sustainable energy sources and those that oppose it as part of the same field. They are aware of each other, of each other's positions in the field and of the resources involved. We argue that, despite the apparent agreement on the issue at stake, conflicts and tensions arise within that field concerning the rules, regulations, and common reference frames against which behaviours are judged. Based on insights about conflicts in transitions, we argue that processes of adaptation and delimitation continually re-shape the structure of the field. In an empirical case study of Northern Hesse in Germany, we identify regulative, normative, and cultural-cognitive dimensions of both processes. We thus contribute a perspective on the dynamics of institutionalisation in fields and a more nuanced understanding of the development of entrenched positions in regional energy transitions.

Keywords:

Regional transition fields, energy transition, organisational institutionalism, strategic action fields, wind energy

1. Introduction

In empirical case studies we observe increasingly conflictual confrontations when it comes to negotiating the course of action in regional energy transitions (Reusswig et al., 2016). We still lack an understanding of the underlying dynamics that explain the strong institutionalisation of such conflicting positions, and resulting hardened fronts between groups that share the concern for the regional energy future.

We build upon the field concept from organisational institutionalism to arrive at a perspective onto transitions that encompasses all actors, activities and organisations that share a concern in this process. This allows us to include supporting as well as opposing actors in a strategic action field (SAF; Fligstein and McAdam, 2011). The shared concern, here, is the future energy mix, i.e. the combination of all technological and non-technological solutions involved in the energy transition. It follows that all actors that participate in negotiating over this future, whether they work in favour or against sustainability transitions, are part of this 'transition field'. Differences amongst the participating actors regarding rules and regulations, as well as the shared reference frame against which behaviours are judged cause frictions within the field. These frictions result in processes of adaptation and delimitation based on different interpretations and interests regarding said rules and shared reference frames in the field. Processes of adaptation and delimitation do not occur automatically, nor are they inevitable, but they are framed and shaped by the individual and (to a certain degree) autonomous decision-making process of the collective and individual actors involved in the field. Based on these processes, the field is constantly being restructured. This involves regulations, routines, norms and associated expectations as well as knowledge and understanding.

We apply this perspective to the regional energy transition in the region of Northern Hesse. Through an in-depth qualitative case study, we assert the existence of an RTF in Northern Hesse which shares the concern for the future regional energy mix. We point to key actors, their positions, and associated resources within this field. We offer evidence of structuring dynamics of adaptation and delimitation in the regulative, normative, and cultural-cognitive dimension. We show how adaptation and delimitation dynamics shape sub-fields which may incorporate and stabilise institutional contradictions.

The remainder of the paper is structured as follows: In the second section, we turn to the state of the art regarding stabilization and institutionalization in transition studies, field theory and its application in this literature, and existing understandings of conflicts in regional transitions. In the third section, we illustrate our conceptual approach and original contribution. Our methodology for this paper is explained in the fourth section. The analysis (section 5) first turns to illustrating the existence of a RTF in Northern Hesse, which shares the concern over the future energy mix as issue at stake. We then turn to introducing key actors, their positions and their roles and interests in this RTF. We analyse contestations over rules and regulations as well as the shared reference frame against which behaviours are judged. We show how these contestations result in processes of adaptation and delimitation across three dimensions, the regulative, the normative, and the cognitive. We discuss our results vis-à-vis existing literature on conflicts in regional energy transitions and conclude in the final, sixth section.

2. State of the art

Following a brief rationale for our exploration of supporting and opposing forces for energy transitions on the regional level we start this chapter with a brief overview of the state of the art on the role of stabilization and institutionalization in transitions. We then introduce field theory and its use within

transition studies. Finally, we turn to the matter of conflicts in energy transition before we move on to explain our conceptual approach in the following chapter.

The region has been identified as a key spatial level in transition processes, often being the place where local initiatives originate, and studies have identified explanations of regional heterogeneities and patterns of regional transitions as key research areas (Coenen et al., 2021; Losacker and Kuebart, 2024). Becker et al. (2016) emphasise the role and relevance of the local level and of cities and communities as the place where the success or failure of the energy transition project is decided. These are the places where nation- and countywide decisions are put into practice and where negotiations over collective needs and future visions, and the conflicts they bring along, emerge. Contributions have emphasised the role and relevance of the regional level as part of multi-scalar systems of governance as well as of global innovation systems (Rohe, 2020, 2021). The regional level is therefore a good starting point when it comes to observing and understanding the social dynamics involved in transition processes (cf. Chlebna and Mattes, 2020).

2.1. The role of stabilisation and institutionalisation in transitions

Transition processes bear an inherent tension between stability and change (Frantzeskaki et al., 2012). Hence, both agency and institutions have been in focus in transition studies. Institutional perspectives have taken hold more recently. These are crucial to understand transitions which would not progress without the institutionalisation of the involved processes (Genus, 2014). Therefore, important questions arise such as “What makes socio-technical configurations stable, where and how does innovation come from and how does transformation unfold?” (Fuenfschilling, 2019, p. 223). These questions render concepts from organisational institutionalism useful for exploring the institutionalisation of transition related structures, their persistence and the events and processes that condition their de-stabilization (Fligstein and McAdam, 2011; Kungl and Hess, 2021). In this context Köhrsen (2018) points to the important role of both internal and external policy actors to stabilise the regional field and herein emphasises the foundation of intermediaries and negotiation of different interests. Similarly, Jehling et al. (2019) point to the important role of institutional consistency across different governance levels to stabilise environments for and enable local actors. Øvald et al. (2023) point out the role that the power and control over future resources play for the stabilisation of transitions. Both institutional work and institutional entrepreneurship have received much attention in transition studies in recent years (Arenas et al., 2020; Löhr et al., 2022; Bulah et al., 2023). Fuenfschilling and Truffer (2014) draw on institutional approaches and combine ‘degrees of institutionalisation’ (Tolbert and Zucker, 1996) and ‘institutional logics’ (Thornton and Ocasio, 2006) to understand the inherent tensions between change and stability within transition processes. In this contribution we adopt an institutionalist perspective to enlighten the “carriers, mechanisms, and processes” (Genus, 2014, p. 289) that shape stabilisation. We therefore introduce field theory from organisational institutionalism in the following chapter.

2.2. Field theory and its application in the transition studies context

Building upon the outlined importance of stabilisation and institutionalisation and at the same time acknowledging a certain dynamic behind these processes, institutional scholars have introduced the concept of institutional fields. The concept of fields draws together all those (individual and collective) actors who are involved in activities and discourses around a certain topic. The field also comprises the related institutions, implying that the respective actors are subject to shared regulations, norms, and cultural-cognitive patterns. There is a multitude of field concepts that are conceptually closely interrelated, most prominently Bourdieu’s (1990) fields according to social status, Lewin’s (1951) fields with a particular focus on inherent ‘field forces’, Scott’s (2009) organizational fields and, building upon the latter, strategic action fields (SAF; Fligstein and McAdam, 2011).

By focussing directly on power relations (Fligstein and McAdam, 2012, p. 217), the concept puts negotiation processes and power struggles centre stage which makes it particularly adequate to understand how regional transition processes unfold. At the same time, SAF are not static. Instead, involved actors constantly assume new roles, build groups, re-negotiate their positions within the regional field and learn from each other (Fligstein, 2001).¹ These dynamics are key for understanding how institutionalisation processes shape transitions. Seeking to identify SAF in and beyond regions brings up the question of the boundaries of particular fields. Fligstein and McAdam (2012, p. 216) define them as the adherence to a tacit set of rules and perceptions: “(1) an agreement about what is at stake, (2) an agreement about who the players are and what positions they occupy, (3) a consensus regarding the rules by which the field works, and (4) a shared interpretative frame that allows those in the field to make sense of what other actors are doing in the field in a particular situation.” This implies that SAF undergo processes of social closure (Heidenreich and Mattes, 2022) by differentiating internal activities from external ones, in this context, both geographically (regional level) and topic-related (future energy mix).

In its application to transition research, the concept itself is in flux and subject to constant adaptations. It has been used to explore the emergence of fields around certain issues, mostly at the national level (e.g. Wassermann et al., 2015; Mey and Diesendorf, 2018; Webb and van der Horst, 2021). The application to the regional and local level is less common in the extant literature. Blanchet (2015) utilizes the SAF concept to show how the electricity grid infrastructure in Berlin did not just structure the interrelationship between actors but also became an object of social construction depending on their vested interests. Schwarz (2020) criticises the lack of detail on the complexity of power relations, especially regarding citizens. He adds a consideration of their position in the field to build a typology. Köhrsen (2018) proposes an evolutionary perspective suggesting that constellations in fields and the associated power relations change over time and that it depends on the stability of field structures whether established transition pathways prevail (cf. ‘fragility’ argument by Chlebna and Mattes, 2020). Britton and Webb (2024) examine the emergence of local energy systems in Britain using an SAF approach. They found that identities of actors (creators, disruptors, incumbents) were shifting between different roles depending on context and point to the relevance of field overlap and field interactions between SAF. Fuchs and Hinderer (2016) emphasise the importance of studying the mechanisms that bring about change, thereby encouraging the use of a field perspective.

With their explicit focus on conflicts and power that is central for understanding the evolution of transition fields, we find strong inspiration in the SAF concept and focus particularly on the inherent institutionalisation. In the following, we turn to the role of conflicts in energy transitions.

2.3. Conflicts in regional (energy) transitions

Conflicts are at the core of SAF theorising. At the same time, they are also addressed in transition studies from different conceptual starting points. Since we are interested in the institutionalisation of conflicting interests, it is worth looking into the wider debate on conflicts in the local and regional transition context.

The detailed study of conflicts, it is argued by authors such as Grossmann (2019), can bring to the fore injustices that are hidden underneath the discursive surface in energy transition processes. She even attributes a constructive role to conflicts, when, referring to conflict theory (Bonacker, 2009), she ascertains that conflicts provide group identity and can be a source of cohesion despite other differences. She explains how they create a ‘we/us and them’ perception and serve as a valve to release tension which stabilises groups internally. The literature distinguishes between normative and distributional conflicts where the latter concerns conflicts over scarce resources and goods whereas

¹ For the application of field theory to energy transitions, cf. also Fuchs and Hinderer (2014); Fuchs and Hinderer (2016)

the former concerns conflicts over norms and values, where rather than ‘more or less’ questions of ‘either or’ are negotiated by the participating parties. In the context of energy transitions, such normative distributional conflicts are commonly entangled. A further distinction is made between real and artificial conflicts where in real conflicts the object that the conflicting parties articulate is at the heart of the conflict, while for artificial conflicts the actual object is different from the articulated object of conflict. The object of conflict therefore mainly has a symbolic role. It may even serve to negotiate other, underlying social conflicts (cf. Becker et al., 2016). In the case of the energy transition, conflicts may actually arise from questions of social appreciation, representation, definition power of local identities, and group specific energy transition visions (Becker et al., 2016).

Despite these important starting points on the institutionalisation and stabilisation of regional energy transition processes, and on conflicts within these processes, our understanding of the dynamics that underlie the empirically observable hardened positions between actors remains rudimentary. Much of the existing literature on conflicts points to a greater focus on the dynamics behind conflicts (Becker et al., 2016; Reusswig et al., 2016; Krüger, 2021) and to exploring shared patterns in different geographical spaces. We respond to this encouragement by putting the focus of this contribution on the underlying dynamics that lead to entrenched positions in conflicts between actors on the regional level as part of the negotiation processes over regional energy transitions. Although we illustrate our framework in a single case, we expect that these dynamic patterns are transferable to other geographies and even to other transitions. We therefore ask the question *Which are the underlying dynamics that explain entrenched positions vis-a-vis regional energy transitions?* In response we develop the concept of Regional Transition Fields (RTF) that will be introduced in the following chapter.

3. From strategic action fields (SAF) to regional transition fields (RTF)

The central question of this paper is which are the underlying mechanisms that cause the entrenchment of positions within regional energy transitions. By ‘entrenchment’ we seek to capture the hardening of positions vis-à-vis regional energy transitions as we observe it empirically. ‘Entrenchment’, defined by the Cambridge Dictionary as the “process by which ideas become fixed and cannot be changed” (Cambridge Dictionary, 2023), is nothing else but the strong institutionalisation of a position, made up of the actors and associated routines, ways of thinking and views of the world. The aim is hence to discuss how different kinds of activities that are part of transition processes are institutionalised, i.e. transferred into durable, reliable structures. This can include both driving and hindering activities. We thereby offer a dynamic perspective onto these hardened positions. As outlined above, it is useful to look towards institutional theory to answer this question, in particular, institutional fields. We enlighten the specific traits of these fields in the following.

3.1. Regional Transition Fields

Building upon applications of SAF to regional or local transition processes (Fuchs and Hinderer, 2014; Köhrsen, 2018), we suggest to systematically frame these particular SAF as regional transition fields (RTF). RTF provide a regional perspective onto transitions that encompasses the actors, activities and institutions in a particular region involved in this process whereby similar dynamics of role-defining, group-building, position-negotiating, as well as challenger-incumbent conflicts occur, which drive the process of transition. RTF encompass actors and institutions with diverse backgrounds. This includes supporting as well as hindering structures and actors. Regional activities involved in transition processes (such as e.g. the transition work outlined above) can be grasped as part of an RTF. While the regional level is central for transitions, RTF are of course no closed containers. Instead, they overlap regionally with other, functional fields, and interact with transition fields at other spatial levels in a multi-scalar sense (see Figure 1). Fløysand and Jakobsen (2011) describe this as complex field structure. While we acknowledge this multi-scalar nature of transition fields, this paper focuses on the

conceptualisation of RTF. We will turn to the need for future research on the interdependencies between fields at multiple scales in the final chapter.

Actor groups in multiple fields negotiating transition

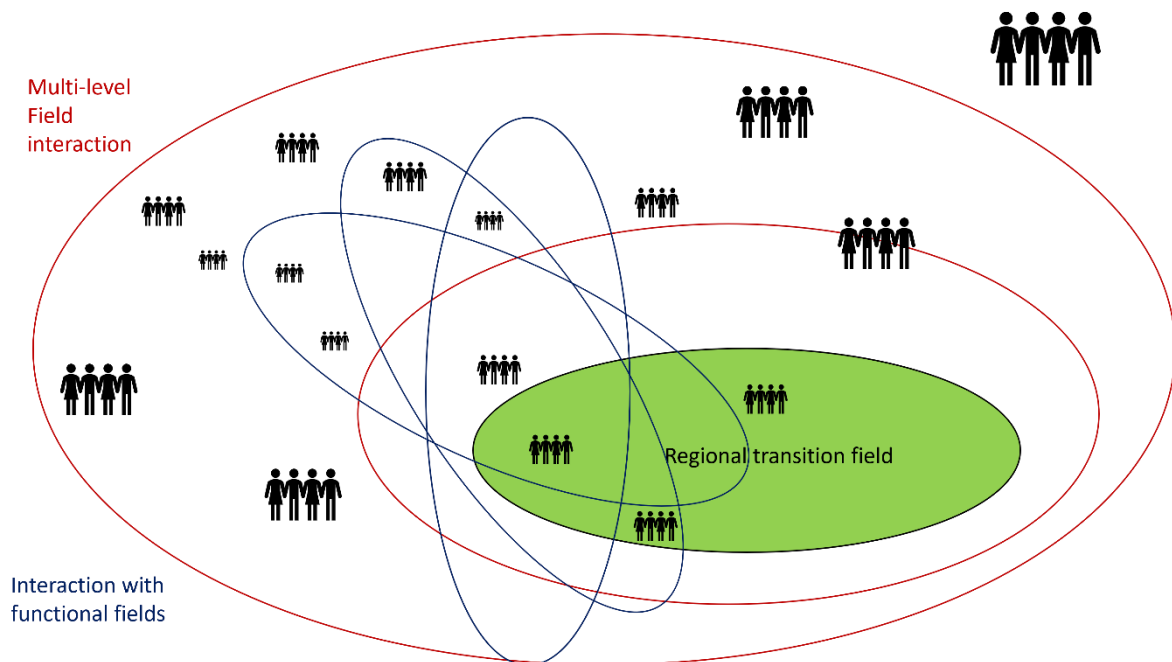


Figure 1: Regional transition field interacting with other functional fields and fields at multiple scales

3.2. The constituting elements of RTF

We develop the RTF along the constituting elements of the SAF as outlined by Fligstein and McAdam (2012). The first constituting element, the shared issue at stake, is at the core of the definition of a field, meaning that if there is no shared issue at stake, by definition, the field does not exist in the first place. Contestation over what is the issue at stake, therefore, de-stabilises the field as such. The second constituting element, key ‘players’ in the field are individual and collective actors. They constitute the field itself, which implies that actors in the field are aware of other actors and can judge their power position. If who the players are in the field is largely established, then the field may be considered relatively stable. Third, we argue that even in a relatively stable field, actors position themselves vis-à-vis the rules and regulations of the field on the one hand, and fourth, the shared interpretative frame that they apply to judge actors’ actions against on the other hand. It is implicit here, that independently from their judgement of the rules, the field’s players share an awareness of the relevant respective rules and regulations. The rules form part of the definition of the field and are collective knowledge for all those active in it. Equally, there is consensus about a shared interpretative frame. When observing each other’s behaviour, field actors are commonly able to judge if this behaviour is in line with the rules of the field or not – if it conforms or does not conform and which consequences can be expected from deviating behaviour.

3.3. Forces of adaptation and delimitation

As part of the actors’ positioning and re-positioning themselves vis-à-vis the rules and regulations in the field on the one hand, and the shared interpretative frame on the other hand, we find two central forces, adaptation and delimitation. Adaptation and delimitation occur as actors negotiate the rules and regulations and frames of reference that structure the enactment of the issue at stake within a relatively stable field. There is a reciprocity between the actors in the field and the structural forces.

Adaptation is a force which encourages actors to adjust to dominant rules and behavioural frames within the field. Ultimately, this implies a more homogeneous field although this is not necessarily a

conscious aim of the involved actors. At the same time, actors may either choose to reinforce it by enacting the structures or they can adjust or resist them (see delimitation below). Actors decide more or less consciously and more or less strategically in favour of or against conforming with prevailing rules or behavioural frames. Likewise, they deploy strategies to change other actors' convictions and eventually behaviours either forcefully (by law) or discursively (by negotiation), usually based on their own conviction. Resistance may be met by creating and entering in shared negotiation arenas or it may be ignored. The latter is likely to reinforce 'delimitation', to which we turn in the following.

When actors engage in work against prevailing rules we speak of delimitation. Decision making processes are highly dynamic and actors may shift their positions in response to how their doubts and concerns were met. While the force of adaptation to prevailing rules and behavioural frames will be strong in most observable fields, if actors with sufficient power engage in delimitation strategies, a co-existence of both forces can remain in place over time, or indeed the previously dominant rules and frames of reference may be exchanged for new ones.

Therefore, while Fligstein and McAdam (2011) describe phases of contention and settlement of the field as such, we suggest that dynamics of adaptation and delimitation take place within relatively settled fields when actors position themselves vis-à-vis the rules and behavioural frames of reference. Even within settled fields, we expect to observe negotiation and strategic actions regarding the exact form and definition of rules and reference frames. Rather than describing dynamics at the field settlement stage, adaptation and delimitation hence circumscribe the everyday frictions and positioning within relatively settled fields.

3.4. Forces in regulative, normative, and cultural-cognitive dimensions

We argue that the above-described dynamics of adaptation and delimitation from prevailing rules and frames of references become effective across the three institutional dimensions, as per the institutional 'pillars' according to Scott (2009), the regulative, normative, and cultural-cognitive.

Forces in the regulative dimension are commonly linked to written rules and regulations and usually imply an authority. The regulative dimension is closely connected to political aspects and to gaining legitimacy. Predefined processes are being imposed upon the involved actors, and standards are defined that must be followed. In this sense, regional transitions occur as processes of negotiation and decision-making, whereby the resulting decisions define the rules of the field in a binding way. Who takes these decisions and who adheres to them is closely related to the distribution of power in the region. Power is hence a central determinant in social fields as positioning oneself in a field always implies competition and struggles with other field actors. The resulting structures are rules and regulations that act upon actors who will either enact, follow, or reinforce them (adaptation) – or resist them, ignore, or deviate from them (delimitation).

The normative dimension comprises the endogenous definition of new norms, expectations and frameworks of acceptance and self-conception, i.e. how actions are being framed. This changes actors' understanding of what is appropriate. The selection of personnel with certain qualifications is a prominent mechanism, likewise the prevalence of certain professional routines. Norms in the context of RTF are not restricted to professional routines and organisational interaction but may likewise impact everyday life such as attitudes towards energy saving. Again, the resulting normative structure exerts a force upon the actors in the field who will either enact and promote the dominant norms (adaptation) or will deviate from them and promote alternatives (delimitation).

Forces in the cultural-cognitive dimension concern processes around the creation of knowledge and reflection. Uncertainties encourage actors to mimic each other. Actors learn from each other and encapsulate new knowledge (e.g. in new technologies) during the outlined field restructuring. This is

particularly crucial if there is no clear internal orientation for an actor, which makes it attractive to observe and possibly copy what other actors are doing. Particularly organisations tend to 'model' their structures along those of others (cf. 'iso-morphism', DiMaggio and Powell, 1983). Thereby, best practices evolve. Actors also convey knowledge to each other in the form of procedures and technological expertise. Actors will either take on and copy best practices as well as contribute to the development of knowledge and expertise (adaptation). Or they will find arguments against the prevailing body of knowledge in the field or even seek to instate outdated or wrong information (delimitation).

In sum, processes of adaptation and delimitation describe the dynamics that occur within relatively settled regional fields when actors position themselves vis-à-vis rules and behavioural reference frames. Forces arise across three institutional dimensions (regulative – normative – cultural-cognitive). Based on these, RTF are continuously being restructured (Fligstein, 2001; Fligstein and McAdam, 2011). This can result in increasingly homogenous (and harmonious) RTF, but may likewise lead to 'entrenched positions', i.e. through the stabilisation and institutionalisation of conflicting positions vis-à-vis rules and frames of reference. This can entail a complete restructuring of the field where previously prevailing rules and frames are exchanged despite apparent field settlement.

These considerations are summarized and operationalized in Table 1.

Adaptation and delimitation dynamics in regional transition fields		
	Adaptation	Delimitation
Regulative dimension	<ul style="list-style-type: none"> - Deciding upon and enforcing the compliance with transition related rules and regulations as well as a shared behavioural frame of reference 	<ul style="list-style-type: none"> - Undermining existing and developing alternative transition related rules and regulations as well as shared behavioural frames of reference
Normative dimension	<ul style="list-style-type: none"> - Promoting transition related technologies and ideologies and acting upon them 	<ul style="list-style-type: none"> - Opposing transition related technologies and ideologies
Cultural-cognitive dimension	<ul style="list-style-type: none"> - Establishing knowledge about transition related technologies and principles - Copying best practices from other regions 	<ul style="list-style-type: none"> - Arguing against transition based on outdated or wrong information - Ignoring best practices from other regions

Table 1: Adaptation and delimitation dynamics in regional transition fields

4. Methodology

To illuminate the processes of adaptation and delimitation in RTF, we draw upon a qualitative case study of the region of Northern Hesse in Germany.² The aim of this study is to contribute to theory building, i.e. to illustrate our framework. A case study approach is therefore appropriate (Eisenhardt, 1989). An in-depth single case study allows illustrating in detail theoretical assumptions, such as in our case specific social dynamics, namely adaptation and delimitation across three institutional dimensions, within a RTF (Yin, 2009; Sovacool et al., 2018). The empirical data for our case study stem from onshore wind energy. Northern Hesse provides a strong background for this study as there is a significant breadth of different actor types present who are influencing the energy transition through a range of activities. This includes both activities in favour of more wind energy in the regional energy mix as well as against. This was considered an important pre-condition for this study as it allows for Northern Hesse to serve as a paradigmatic case study to illustrate the principles of our framework (Flyvbjerg, 2006).

The region of Northern Hesse circumscribes the area around the city of Kassel in the North of the German state (Land) of Hesse. Northern Hesse is one of three planning regions in Hesse, next to Middle and Southern Hesse. Apart from spatial planning this regional definition is also used for strategic matters such as tourism and regional economic development (cf. Hahne et al., 2012; Gottschalk et al., 2016). Whereas Middle and Southern Hesse are primarily shaped by the university cities of Marburg and Gießen, Northern Hesse is, apart from Kassel, considered more rural. Yet, an early impulse for the regional transition stems from the University of Kassel where many of the individuals still present in the region studied energy system technologies, drawn to the city and university by a well-known professor (Rohe and Chlebna, 2022). Like many regions in Germany small, fragmented wind initiatives existed in the region, but the introduction of the renewable energy law (EEG) in 2000 changed the

² Details on the project can be found at [blinded reference].

financial conditions and led to a first wave of wind development. In the regional perception, however, an energy summit by the Land Hesse held in 2011 in response to the Fukushima nuclear incident of 2011 is considered very important for the regional transition process. At this summit a broad range of actors settled on committing 2% of the total land area of Hesse to wind energy (Gottschalk et al., 2016). Given that 42% of Hesse's land is forested, it was decided at the summit that wind development was also going to be allowed in forest areas, which is not the case in other states, and has led to significant local conflicts.

During the case study, we carried out 25 semi-structured expert interviews in the region of Northern Hesse between October 2019 and February 2020. We interviewed individuals and representatives of organisations either directly or indirectly involved with the wind energy development in the region (politicians, firm representatives, scientists, activists etc.), which gave us access to a broad range of perspectives and covers the relevant regional field including both actors and organisations supportive of and opposing renewable energy in the regional energy mix. Interviews lasted between 40 and 115 minutes, 74 minutes on average. They were all conducted based on a semi-structured interview guide which covered the role of the interviewees and their organisation, the interviewee's relation to other actors in and beyond the region, the ongoing energy transition (with a particular focus on wind energy) in the region and beyond, the role of the region for this transition process, and conditions for change. The interviews were recorded, transcribed, and underwent general coding with the help of the qualitative analysis software MAXQDA. Besides the interviews, we used participant observation to evaluate the micro dynamics of regional actor constellations. We took part in networking events and in round tables on the further wind energy development in the region. Completed by a detailed document study, the insights resulted in an encompassing and systematic case study which was validated locally. For this paper, the analytical categories were deduced from the above-introduced theoretical framework. We collected segments from the most relevant codes (i.a. regional specificity, negotiation, learning, institutionalisation, routines, ...) in a table and gradually reduced to the most relevant segments. These were then attributed to the three dimensions (cognitive, regulative, normative) and two types of pressure (adaptation, delimitation). Furthermore, we collected evidence for the existence of a field which shares the future energy mix in the region as common issue at stake. In the analysis chapter below, we summarise the information from these segments.

5. Empirical findings

Above, we have explained our approach and the methods we employed for this study. We now turn to the analysis of our findings. We do so along the constituting elements of RTF as described above. Therefore, we first outline the shared issue at stake that constitutes the RTF (5.1). Second, we turn towards the key players and their positions and power within the RTF (5.2). Third, we trace occurring adaptation and delimitation pressures in the regulative, normative, and cultural-cognitive dimensions (5.3.1 to 5.3.3).

5.1. A shared issue at stake constituting the RTF in Northern Hesse

In the first step, we highlight the shared issue at stake that allows us to assume the existence of an RTF in Northern Hesse. The joint concern thereby lies in the future energy mix of the region. The shared issue also defines the borders of the relevant region.

Energy, particularly renewable energies and wind energy, has developed into a key driver for overall regional development and is hence a crucial field of interest for firms, politics, and society in Northern Hesse (cf. Gottschalk et al., 2016). In addition, we find a regional spirit of cooperation and coherence

(NH25_private_sector)³. Besides pointing at the ideological motivation of first movers (NH07_private_sector), a certain openness for change and, more specifically, for ecologically viable technologies is perceivable amongst the general population in the region. This underlines the shared issue at stake when it comes to the sustainable development of the region along with a very concrete willingness to cooperatively negotiate further steps towards the future regional energy mix:

„[...] it does feel like there is a bit more openness for change and new things here. [...] My impression is that there must be a kind of green ecosystem here and because of that the environmental consciousness is a bit stronger. Actually, it doesn't matter if it is stronger than elsewhere but this way of thinking certainly exists here.”
(NH10_science)

At the same time, there is also institutionalized opposition, particularly against the installation of wind turbines in forests which is the prevalent constellation in the very forested region. The future energy mix as shared issue at stake is under negotiation and there are not only proponents of a higher share of renewable energy (and wind energy in particular) (Chun et al., 2023) but also outspoken opponents (Aktionsbündnis Märchenland, 2023). In the following, we will turn to the actors constituting the RTF in Northern Hesse.

5.2. Actor composition of the RTF in Northern Hesse

Regarding the actor composition, the region is characterised by a great number of organisations and individuals in many different fields of activity, including wind development.

In wind project development the most relevant actor locally is the municipal utility, which has united with other utilities in the region to be able to offer an alternative to the Big Four (energy suppliers) in Germany. It enjoys considerable legitimacy amongst the population (cf. relevance of 'regional embeddedness' - Rohe et al., 2023), not just locally but also nationwide. Next to its other activities the utility develops wind parks in the region and strives to maximise participative procedures, opportunities for financial participation, and fair rents for owners. A small number of individuals at this organisation are particularly well-networked and considered core to the regional energy transition (Rohe and Chlebna, 2022).

An important intermediary explicitly exists since 2003 to facilitate the network amongst the many smaller regional firms and to encourage knowledge transfer and collaboration between the university, regional businesses, and skilled crafts and trades in Northern Hesse (deENet, 2013). Many of the core members of this organisation are friends from university times who have stayed in the region (Mauritz, 2018; Rohe and Chlebna, 2022). The network organisation is perceived to be very important in the region but is not as recognised beyond.

The university remains a focal point for the regional ecosystem around renewable energy and sustainability, together with a Fraunhofer institute for energy economics and energy systems. Early on the university established a record within energy system research and numerous spinouts emerged. An important example is an internationally renowned producer of electrical converters which are an essential component of both wind turbines and solar panels. Key actors then stayed in the region with their companies and became influential members of the above-mentioned network organisation. Perceived from within the region, the decisive actors for the current transition dynamics are considered a distinctive group of people that is characterised by a closely-knit network based on common history and personal ties (NH11_network_agency; NH14_network_agency). This points very clearly to the existence of a regional field which is held together at its core around a closely connected – dominant – group of individuals that drive the transition according to their visions and ideas for the

³ We refer to the conducted interviews that have been numbered in parenthesis when quoting direct empirical evidence (NHXX - Northern Hesse number of the interview) and also state the agency group of the interview partner.

future (Rohe and Chlebna, 2022). They are likely to be powerful agenda setters in the region and to exert adaptation forces onto others.

“The personalities that you would associate with the energy transition in Northern Hesse in my view are a group of ten to fifteen people that have been around already ten years ago. That’s a pretty stable clique or group who do an incredibly good job.” (NH14_network_agency)

Given that much of Northern Hesse is forested and the fact that there has been a shared commitment to designate some of these forests as wind development areas early-on, the organisation that manages the use of forests on behalf of the Land Hessen plays an important and powerful role. Regional project developers lament that land was commonly leased to the highest bidders instead of considering other factors such as the longevity of projects or local benefits. The organisation, however, is bound by the rules for administering state land which foresee the maximisation of financial value on behalf of the taxpayer. Whilst power is commonly attributed to this organisation, this is largely down to a regulative structure instead.

Opponent groups, formed by concerned citizens, are also part of the regional field in this region. Especially one project, mainly organised by the local utility, which mostly uses areas that have first been destroyed by the bark beetle and then been effectively cleared out by storms, provokes much opposition (Scientists 4 Future Kassel, 2023). Parts of this opposition boil down to a disappointment with the Land Hesse due to its apparent lack of response to an unrelated historic incident. The community rose in response and recovered but now is highly aware of perceived external threats. This reflects the literature on conflicts introduced above, which points to situations where the immediate renewable energy project is only superficially the object of conflict, and the real conflict is deeper-seated and rooted in previous experiences (Becker et al., 2016). Local and regional groups do link up with national and international interest bodies and develop strong communication strategies. Over time, they have therefore gained significant power and influence.

5.3. Structuring dynamics in the RTF in Northern Hesse

We have introduced the shared issue at stake in the RTF in Northern Hesse and discussed key actors and actor groups and their positionality within the field. We will now turn to rules and regulations and shared reference frames within the field that regulate participants’ behaviours. We have explained above that two core forces, adaptation and delimitation, can be detected across three dimensions. Below, we show evidence of these dynamics for each dimension.

5.3.1. Adaptation and delimitation in the regulative dimension

In the regulative dimension, adaptation largely relies on clearly defined regulations that are based on law. An example is the decision of the federal state Hesse to designate two percent of the state area as wind priority areas, which is then mirrored in respective regional plans.

“The speciality of Hesse is the decision by the federal government [of the Land] at the energy summit [of 2011. ...] That was a lengthy process, but the result was that the regional plans had to designate two per cent of the land area for wind energy.” (NH01_civil_society)

This also goes along with certain conditions for how and where wind energy turbines can be erected, including designated areas in forests and a distance of wind parks of 1,000 metres to settlement areas (NH04_public_sector). The distribution of areas is a complicated planning task (NH20_private_sector) and there is increasing pressure to find suitable areas (Bosch, 2020). These are also sites of power exercises and delimitation as the example of a local mayor shows, who is said to have influenced parameters in such a way to prevent sites from being designated as wind areas. It is a common argument that politicians at all levels work on their re-election rather than on the longer-term interest of the community which in turn shapes the (wind) development prospects of the community.

“And then you just designate an area, you did what is required by law, but you are not behind it, because you are afraid of not being re-elected.” (NH18_private_sector)

As part of these negotiation processes also those who work towards delimitation, for example those engaged in anti-wind initiatives, may achieve institutionalisation through democratic legitimisation by entering local and regional committees (cf. Rohe and Chlebna, 2021; NH02_public_sector). They also professionalise, liaise with similar initiatives elsewhere and get legal advice (NH05_public_sector) which strengthens their position in the regulative dimension.

5.3.2. Adaptation and delimitation in the normative dimension

Normative adaptation processes can be seen in the shifting attitude towards renewable energies. It is very evident that sustainability and the need of fostering renewable energies are highly present topics in the public discourse in Northern Hesse (NH13_networking_agency), and that more and more citizens regard wind parks with pride instead of mistrust (NH05_public_sector). This goes along with citizens organising themselves in sustainability-oriented associations and joining existing non-governmental bodies. In this sense, normative adaptation manifests itself in formal organisational arrangements.

“This autumn we had a meeting and they said: we have had 8000 new members in just one year just because of climate change and the visible dying of our forests.” (NH22_civil_society)

The process of renewable energies gradually getting more mainstream is voiced by several interview partners. Some compare Northern Hesse to other regions where much more wind energy has been installed (NH14_public_sector), others anticipate a process of getting used to renewable energy technologies including wind energy for the future (cf. Tampakis et al., 2013).

“I just think what my children and grandchildren will say in twenty to thirty years about wind turbines which will just be a normal part of the landscape and won't be perceived as disturbances anymore. A lot is shifting there, I think.” (NH24_public_sector)

On the other hand, there is a significant sense of ‘landscape’ in the region, not least due to its touristic value (Hahne et al., 2012). The forests also play an emotive role in the identity of the region. The touristic board uses a reference to the Grimm brothers in its branding of Northern Hesse (‘Grimmheimat’) (Regionalmanagement Nordhessen GmbH, 2023) and the citizen group against the contested wind park in a nearby forest calls itself ‘Pro Märchenland’, i.e. ‘Pro fairy land’ (Aktionsbündnis Märchenland, 2023). Furthermore, people strongly associate with these forests near their homes, they are strong sources of identification and sentiments of ‘Heimat’ (‘homelands’).

“You just cannot put them down as backward-facing idiots, this is a relevant feeling, and the connection of people with their region, their landscapes, their homelands, this is something you need to take serious in the discussion.” (NH24_public_sector)

Increasingly, conservative and right extremist parties tap into these sentiments to gain votes (Reusswig et al., 2020). These strong sentiments are a source of conflict and resulting delimitation, partly because of an overestimation of the impact of wind turbines on the forest.

5.3.3. Adaptation and delimitation in the cultural-cognitive dimension

In many ways intertwined with the normative adaptation are processes of cognitive adaptation that substantiate the described change of attitudes with knowledge and reflection. This goes along with dealing more with the topic of renewable energies, both in the private and in the public realm (NH20_private_sector). Public perceptions and attitudes are affected by global developments⁴, but they are also impacted by immediate peers. Directed information campaigns on the local level can strongly influence attitudes towards individual projects. Existing views may be reinforced but such

⁴ Consider the Russian attack on Ukraine and global crises such as the COVID-19 pandemic which not only influenced citizen's perceptions on energy vulnerability but also had a direct impact on energy prices (Hoang et al. (2021); Zhang et al. (2023)).

campaigns can also mobilise new alliances as in the case study described by Reusswig et al. (2016). They describe a situation where proponents thought support for a wind park was already sufficient and did not further engage with the local population, whilst opponents launched a very effective counter-campaign and thus gained dominance in the discursive arena. Along the same lines, one interview partner in our study describes how information should be directed not only at those undecided but also at supporters.

“Broad information avoids [...] that the ill-led arguments of the opponents turn into a broad movement. [...] I also made sure in [place name] that we kept the supporters on board, i.e. kept them informed in a transparent way, took them along.” (NH23_private_sector)

Another interviewee emphasises, however, the difficulty of placing scientific facts, and being up against delimitation efforts through (deliberate) wrong information by opposing groups. A common example are debates around the effects of infrasound in relation to turbines which have been shown to be minimal but were pushed heavily by interest groups and repeatedly picked up and amplified by the media (Koch et al., 2022; NH01_private_sector, NH16_private_sector, NH22_civil_society).

“They always claim that they are looking for information, but they also say that they already know that the information presented by the various actors who appear at these events is biased and not credible. This is the perception that predominates in this context. I have experienced this twice now, that essentially everything that anyone said who was involved in the process was interpreted as fake.” (NH03_civil_society)

Delimitation efforts are often made in the cognitive dimension, apparently presenting facts, but commonly combined with manipulative trust-related emotive arguments such as “we know each other, we play football together, you and I are both from here” (NH06_private_sector). This is often paired with a misconception of speaking on behalf of ‘the people’ who are defending themselves against ‘the institutions’ (NH09_public_sector), thus again mirroring dynamics described in the conflict literature where conflicts create inner cohesion in groups, a sense of ‘us’ and ‘them’ (Grossmann, 2019). Much to the opposite, studies have shown that there is often a quiet majority who have long accepted or even support renewable energy initiatives, even close to their homes, but that they do care about the procedural justice aspects of the development process (Rohe and Chlebna, 2021; Vuichard et al., 2022).

6. Discussion and conclusions

The empirical picture is not a static one. Instead, and this is a strength of our conceptual approach, the analysis of RTF allows to highlight the ongoing conflicts that do not only occur between the involved actors but are at the same time highly institutionalized. We are thereby able to highlight the constant tension between adaptation and delimitation dynamics: We find evidence for adaptation and delimitation dynamics in the regulative, normative, and cultural-cognitive dimension. In the regulative dimension, the implementation of new laws and the definition of designated wind priority areas result in strong adaptation dynamics – while at the same time these are partly being undermined via a purposeful reinterpretation of these very criteria. In the normative dimension, we find efforts of deliberately framing renewable energies as ‘normal’ and ‘positive’, whilst delimitation builds upon a strong attachment to emotions related to undisturbed landscapes and homelands. Finally, in the cultural-cognitive dimension, we find a constant fight between distributing scientific knowledge in favour of renewable energies (adaptation) and utilising knowledge to argue against renewable energies – in some cases wrong information, in others selectiveness in the choice of studies to underline certain arguments (delimitation). Table 2 summarizes these empirical insights from the case study.

Adaptation and delimitation dynamics in the RTF in Northern Hesse		
	Adaptation	Delimitation
Regulative dimension	<ul style="list-style-type: none"> - Designate wind priority areas - Define criteria for wind turbine installation 	<ul style="list-style-type: none"> - Prevent sites from being designated as wind areas
Normative dimension	<ul style="list-style-type: none"> - Renewable energies increasingly regarded as positive and normal - Participation in sustainability-oriented associations 	<ul style="list-style-type: none"> - Emotional attachment to undisturbed landscape - Engagement in anti-wind initiatives
Cultural-cognitive dimension	<ul style="list-style-type: none"> - Increased knowledge on RE - Information campaigns 	<ul style="list-style-type: none"> - Circulating wrong information, e.g. on infrasound, and manipulative arguments - Deliberate misconception of information given

Table 2: Adaptation and delimitation dynamics in the RTF in Northern Hesse

Following the three dimensions of regulative, normative, and cultural-cognitive dynamics, we unpack the processes of institutionalization that take place in RTF. In the regulative dimension, we find rules and laws as a powerful instrument to induce adaptation, often defined at supra-regional levels and imposed as an external force upon the region. These are perceived as particularly binding, which does, however, not imply that there are no delimitation forces. Instead, regulative delimitation is equally powerful and goes along with the definition of prohibiting rules and restrictive laws. Where decision powers exist on the local and regional level, these are also used for delimitation. The normative dimension is deeply rooted in the self-perception of the region and collective identity regarding energy transition. In terms of adaptation, we find processes of getting used to renewable energies which results in a changed perception of the involved technologies and processes. At the same time, normative delimitation resides in deeply rooted beliefs that cannot be reached via arguments or force. Just as adaptation forces, delimitation is connected to ingrained beliefs and long-established habits and routines. An example is the strong relationship with the forests and an inherent instinct to protect it even when it is forest that has long been part of the bioeconomy or has already been substantially destroyed by bark beetles and storms. Finally, in the cultural-cognitive dimension, core disputes concern knowledge about the energy transition. Adaptation pressures are often based on making knowledge about climate change and the importance of renewable energy available while at the same time interviewees report the difficulty of being up against ill-information and emotive arguments which are used to create delimitation.

Drawing these results together, this paper shows that processes of adaptation and delimitation are strongly interwoven: Not only do they play out in the same dimensions, to some extent they even draw upon identical mechanisms, yet to a different end. The definition of adaptation and delimitation is therefore strongly related to the shared issue at stake and is in the first place non-normative. Defining

which are adaptive forces and which are delimitation forces results from the dominant trajectory observable in the region. In the case on hand, where the key concern is the future energy mix, we find a disputed path towards a more sustainable energy mix, rendering activities supporting renewable energy transition as adaptation processes and those fighting against it as delimitation. Hence, the concept of RTF and adaptation/delimitation is transferable to other situations. It is, however, of utmost importance that authors are clear about the issue at stake in their respective empirical field.

We acknowledge that our contribution has several limitations. Empirically, it is based on a single case study, and comparative case studies of heterogeneous cases are needed to further validate our framework. Moreover, this paper focuses on the regional level and the observable dynamics there. Yet, our case study also shows how the regional level is inherently interwoven with governance and other processes at other spatial levels as well as with processes in other regions and even at the global scale. Adaptation and delimitation dynamics in the regulative, normative, and cognitive dimensions at the regional level are highly likely to be influenced by dynamics at those other levels. Now that the key dynamics have been identified, RTF could be used in future studies as a constituting element of multi-scalar conceptions comprising of local, national and, indeed, international transition fields. Exploring their mutual embeddedness and the resulting interfaces certainly constitutes a promising avenue for further research.

In summary, this paper suggests RTF to grasp regional energy transitions and the underlying dynamics in a more structured and comprehensive manner. The RTF is constituted by a shared concern for the future energy mix of the region. The involved individual and organizational actors have heterogeneous interests, but they are all involved in shaping future regional development. They constitute the actors of the RTF. They benefit from, fight against, and strengthen and weaken the occurring adaptation and delimitation dynamics across the regulative, the normative, and the cognitive dimensions in the field. Adopting this lens allows a clearer picture of the institutionalisation of positions over the long term, and it allows to uncover the underlying mechanisms of entrenched positions regarding sustainable regional development.

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