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What Triggers Protest?—Understanding Local Conflict Dynamics in Renewable Energy Development

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Abstract: The expansion of renewable energy infrastructure comes with increasing conflicts at local level that significantly impede the expansion of renewable energy in Germany and impact the realization of national and international climate goals. In some conflicts, rural communities are torn apart and social relations strained beyond the energy conflict. Other projects are realized with no or only minor disruption. To researchers, project developers and local politicians alike, it seems unpredictable as to which way local energy conflicts evolve. Thus, the paper aims to shed light on conflict dynamics and identifies a number of aspects that influence local energy conflicts. The paper applies a conflict theoretical perspective on local energy conflicts. Rather than identifying energy conflicts as a sign of dysfunctionality, conflicts are seen as an important element of a democratic society struggling to find the best way through the transformation towards decarbonization. Based on qualitative research on local energy conflicts in five German municipalities the paper analyzes aspects that encourage constructive conflicts and aspects that impede such developments. With reference to Dahrendorf's conditions of conflict the categories of energy conflicts are systematized within an analytical framework according to conditions of organization, conflict and change. These categories and aspects are embedded in specific local conditions, making conflicts on the one hand typical and on the other very specific. They are also entry points for dealing constructively with the conflicts.

Keywords: energy transition; local conflict; rural transformation

1. Introduction

1.1. The Energy Transition in the Light of Local Energy Conflicts

The deployment of renewable energy infrastructure has evolved as a source of local conflicts that increasingly impacts the realization of national and international climate goals. Nevertheless, their dynamics are far from being understood. Some of these conflicts escalate, tear rural communities apart and lead to years of legal disputes within the planning and licensing processes. Some projects are realized with no or only minor disruption. To researchers, project developers and local politicians alike, it seems unpredictable as to which way local energy conflicts evolve. Regardless of the case, they all display a structural constant: competing interests between various stakeholders are involved [1]. Local municipalities want to ensure the quality of life and economic benefits and have to mitigate land use competition. Residents strive for good and safe living conditions, irrespective of how diverse and eventually contradictory the expectations can be. Project developers, embedded in market logics, need to realize projects as cost-efficiently as possible and aim at generating profit. National or state policies are committed to a speedy expansion of renewable energies in order to meet climate goals and mitigate climate change.

The conflicts carry a distinct spatial component with them. The installation of renewable energy infrastructures is mainly being conducted in rural areas. The large energy

generation plants in particular, including their undesirable effects, are installed in rural areas, not least because of their land requirements. The availability of space for photo-voltaic, biomass or wind power systems is raising the importance of rural areas, which are not only delivering the principal gains of the energy transition but also bearing the brunt of the landscape interventions and political conflicts it is initiating [2–4]. The bulk of energy consumption is concentrated in urban areas. As a result, local conflicts are mostly rural conflicts, while demand and energy policy decision making are predominantly set in urban environments. The infrastructure conflicts that have been politically marginalized and not taken seriously for many years as "local protests" are also primarily developing in rural areas.

Renewable energy conflicts are for us not a sign of social dysfunctionality, instead, we interpret them as an important element of a democratic society struggling to find the best way through the transformation towards decarbonization. The transformation not only consists of a re-construction of fossil-based infrastructures, but also needs to cater to the demands of a democratic state and negotiate demands and interests of a variety of spatial arrangements. Hence, it is important to find ways to constructively deal with conflicts where the global demands of greenhouse gas reduction meet democratic procedures and measures to mitigate negative impacts at a local level.

1.2. Addressing Local Energy Conflicts—Approaches in Acceptance Research

A common approach to these local disputes stems from scientific work in the field of acceptance research [5,6]. Starting from the question why there is substantial local conflict even though national polls show a high level of support for renewable energies and the energy transition (in the German context see, e.g., annual or biannual surveys of the Federal Agency of Nature Conservation (BfN) [7], the Renewable Energy Agency (AEE) [8], the Special Agency for Onshore Windpower (FA Wind) [9] or the Institute for Advanced Sustainability Studies (IASS) [10]), the normative approach of acceptance research generates suggestions on how to minimize conflict and increase acceptance of renewable energy infrastructure. A common way to enhance acceptance is early stakeholder involvement and what Cuppen calls "invited participation" [11]. However, when zooming into the installation sites, vigorous resistance impacts the installation rate significantly [12]. Additionally, these local conflicts increase not only in numbers and professionality, they also become tenser and less conciliatory [13].

Explanations of this "national—local gap" in acceptance research [14,15] have long focused on individual attitudes towards renewable energies [16–18], examining how these attitudes can be changed towards more support or at least less refusal [19,20]. Frequently re-occurring topics include residents' concerns about the negative impacts on landscape, nature and wildlife, fear of health problems caused by infrasound or a fall in property values [21,22]. It has also been shown that issues of procedural justice, such as access to unbiased information and the proper representation of interests within the planning and participation process also influence the individuals' opinion of the projects, both positively, but also in a negative way [21–26]. Regardless of their arguments, opposition to wind power projects is often labelled as driven by NIMBY (Not In My Back Yard) motives, even though valid arguments against the project might exist. The theory of NIMBYism [27] has been accused of delegitimizing opposition [19,28–30] and neglecting arguments from local communities against infrastructure projects [20,31,32].

Acceptance research leans towards consensus driven participation models. While claiming to address procedural injustices, they tend to obscure power relations [33], are uncritical towards incumbent actors [20], are inherently supportive of hegemonic discourses and neoliberal logics [33] and can even be driven by political goals [19,20]. As early as the 1960s this "avoidance approach" to conflict was problematized as a means of "social management or social engineering" [34], rather than challenging existing power relations.

1.3. Shifting Perspectives—Research on Conflicts in the Field of Energy Transitions

In order to develop a critical perspective on local energy conflicts over renewable energy deployment, conflicts should be acknowledged as a "productive means of social change" [34]. While sharing with acceptance research the same overarching question ("Why is there so much trouble with renewable energy infrastructures?"), a conflict theoretical perspective stresses the constructive and democratic potential of these conflicts. It focusses on dynamics and social relations as well as structural elements. It acknowledges competing values and interests and addresses power relations, actor constellations and institutional frameworks that shape conflicts as much as they are subjects of conflict themselves. A conflict theoretical perspective also offers important insights into how this transformation can be managed in a democratic way.

Compared to the vast literature on the acceptance of renewable energy conflicts, a conflict theoretical perspective on local energy conflicts is still rare. Krüger adopts a radical democratic perspective to argue for promoting social conflicts not only through local energy projects, but also along general energy political pathways and questions of the common good in the context of decarbonization [35] and radical democracy [36]. There are empirical studies on conflict dynamics which focus on temporality, discourses and interaction [13] or regional actor-networks [37], and the relevance of conflict for democratic societies [11,21]. Conceptual advances focus on the productive role of social conflict in local energy conflicts. Drawing on hegemonic conflict theory Cuppen critically analyses "invited participation" as top-down arrangements organized by project developers, planning agencies or academia that aim at pacifying local conflict [11]. She suggests that self-organized "invented participation" and collective action can challenge existing power structures and hegemonic discourses. Similarly based on a hegemonic conflict theory, Weber [38] stresses the need to develop a "conflicting consensus" with regard to local energy conflicts rather than aiming at silencing and solving conflict. Kühne furthermore states that, especially in conflicts tightly connected to physical space, that there will always be competing interests over land use or landscapes [39]. Becker and Naumann develop an ideal typical conflict typology and criteria to systematically analyze local energy conflicts [40] in order to shift the focus to analyzing and developing the means to generate productive conflict management, rather than finding ways of avoiding conflict.

1.4. Research Gap and Outline of the Paper

While it seems increasingly clear that conflicts need to become the focus of attention academically, but also in an energy political context, key questions remain unaddressed. Based on qualitative research on local energy conflicts in Germany, the paper aims at presenting a framework that systematizes important categories for encouraging productive conflicts as well as aspects that impede such developments. These categories and aspects are embedded in local conditions, making conflicts typical on the one hand and very specific on the other. With our analytical framework we aim to provide a potential overview of the aspects that influence conflict dynamics. We argue that these aspects are present in every local conflict, however their impact and importance on the conflict dynamics vary according to the local context and their individual settings. Therefore, we first develop a conflict theoretical perspective on energy conflicts (Section 2). Based on Dahrendorf's conditions of conflict the categories of energy conflicts are systematized within an analytical framework (Section 3) and applied to empirical cases of conflicts (Section 4) regarding the energy transition in small municipalities in Germany (Section 5). After having discussed the empirical cases in the light of our framework (Section 6), we draw general conclusions (Section 7) for the understanding and practical handling of energy conflicts and for further research.

2. A Conflict Theoretical Perspective on Energy Conflicts

Energy transitions are never purely technical challenges, but are embedded in economic processes, political decision-making and social relations. They are, thus, socio-

technical transformation processes [41]. Socio-technical developments do not necessarily have to be conflictual. However, the development of our energy systems in particular shows that conflicts are often possible. The fact that conflicts are, so to speak, a social constant [42] of energy transitions can be discussed on the basis of various conflicts over locations (power plants, etc.), land use (wind farms, biomass farming, etc.) and networks (pipelines, etc.). Becker and Naumann [40] identified different types of local energy conflicts: distributional and procedural conflicts, land use and siting conflicts, identity conflicts, and technological conflicts. Empirically, these ideal types show themselves to be interrelated and overlapping. Normative question of procedural and distributional justice, for example, cut across conflicts over competing land uses or energy production technologies.

While conflict theory has played a rather marginalized role in research on renewable energy infrastructure deployment [11], as well as in studies of technology [43], in sociological theory conflicts have long been essential to conceptualizing and explaining social change. Here, conflicts are viewed as both a mode and a driver of social change [44] and serve as an integrative element of societies [45], rather than as a pathologic element that impedes societal functionality, as argued by theories stemming from structural-functionalist traditions and consensus oriented approaches to society.

Social conflicts are inherent to the pluralistic structure of modern societies where individual and collective interests from different social groups, classes or strata collide [42]. Herein lies the productive, creative und innovate potential of conflicts and their stimulating effects, not only for social, but also economic and technical development [43,46]. Hence, without social conflict, social advancement and adaption to an ever-changing environment would not be possible [47]. This holds also for technological changes [43] and changes in landscapes and the physical environment [39,48] that are omnipresent and part and parcel of the efforts to decarbonize society.

Technologies themselves are a vital part of conflict. They can trigger conflict, as we see in many conflicts around renewable energy deployment. They can also shape the way conflicts unfold and develop, as we see in new modes of communication and use of media. On the other hand, social conflict can be seen as a source of technological innovation (such as reducing night lighting on wind turbines) and it can be used by groups or individuals "to preserve or alter social relations" [43]. Technology can challenge existing hierarchies, serving as tools and techniques of empowerment—e.g., when new community-based actors enter the energy sector [37,49]—or the other way around, re-enforcing existing power structures and hierarchies—e.g., through ownership of renewable energy facilities by incumbent large-scale energy providers [37,50]. Technology, therefore, is not neutral, but "governed by the interests and ideas of certain groups in society" [43]. A conflict theoretical perspective sheds light on the elements of power and socially differentiated impacts and interests involved in changes, be they technological, spatial or social. It stresses the need to acknowledge competing or even antagonistic interests and sees conflicts as constitutive of modern societies and liberal democracies.

The institutionalization of conflicts lies at the heart of Ralf Dahrendorf's (1929–2009) conflict theory and therefore seems especially useful for analyzing energy conflicts. It stresses the legitimacy and even necessity of social conflicts where an active public is a key player, and calls not only for a constructive institutionalization of conflict, but also for institutionalized structures of political participation that allow every interested citizen to take part in the political process [51]. As drivers of social change and a constituent element of a liberal democracy, conflicts are indispensable for transformation processes, such as energy transitions. This can only function in a society whose institutions are consistently characterized in their internal order by the recognition and rational channeling of conflicts [47].

In this regard, a regulation of conflicts is inevitable. Neither the suppression of conflicts, which latently leads to an aggravation of the conflict, nor the final resolution of conflicts, which is not realistic due to the continual existence of conflicts of interest between social groups, represent an option for social coexistence [47]. This does not mean that a

solution cannot be found for local conflicts such as those pertaining to the construction of wind farms or other renewable energy infrastructures or related land-use issues. However, even if consensual solutions are found in specific cases, the structural conflicts between developers, political decision makers, landowner or residents remain [47]. So, an energy transition will not and should not proceed without conflict. Rather, it is important to create structures that steer conflicts in a productive direction.

However, not every dispute or fight can be classified as a conflict, and, in particular, not every conflict can be classified as a productive conflict. In order to gain a better understanding of factors influencing conflict dynamics it is important to differentiate between conflicts that are productive and conflicts that are destructive. Productive conflicts are non-violently regulated through granting basic rights to all parties involved and they focus on specific conflict objects. Conflicts tend to be more productive if they are acted out between organized groups that articulate collective interests and when every conflicting party not only abides by the rules of the game, but also acknowledges the legitimate interests of the opposing party [52].

Coser's [34] differentiation between ideal-typical realistic and nonrealistic conflicts proves useful to link the factors of productive conflicts with the dynamics and outcomes of conflict. Here, non-realistic conflicts focus on "tension release" rather than on productive engagement with the object of conflict and the conflict parties. In non-realistic conflicts there are no temporary or local solutions. Conflict is played out for the sake of conflict itself, rather than to alter a particular conflicting situation. The object of conflict becomes interchangeable, because the roots and causes of the conflict remain hidden. Hence, unrealistic conflicts are non-productive since the conflicting parties operating with hidden agendas are not transparent about their actual motives [47]. In energy conflicts this becomes evident when local energy conflicts serve as substitute conflicts for other frequently longstanding conflicts between actors and groups. This can be seen, for example, in the way right-wing populist parties raise the issue of the expansion of wind power without offering constructive, object-focused alternatives [53]. In energy conflicts it can be observed that, over time, conflicts that begin as realistic conflicts turn into non-realistic ones. Non-realistic elements may develop "where there are no adequate provisions for the carrying out of the struggle" [34], for example, through a lack of proper participation opportunities.

By contrast, realistic conflicts are conflicts that are "object-oriented". They aim at a certain object and stem from unsatisfactory relations to it. Specific results related to the object are expected (e.g., installing or preventing renewable energy facilities, optimizing siting and size, developing a concept of profit-sharing, etc.). They aim at "chang[ing] the terms of interaction" [34] and alter the existing social arrangements, structures and power relations, e.g., when wind turbines are built, but ownership structures have changed or revenues are redistributed. However, with conflict and competing interests being a structural component of modern societies, solutions to conflicts can only be temporary and provisional.

A productive outcome of local conflicts could then be defined as an outcome that generates change that incorporates competing interests and has been achieved through a process in which competing interest groups have acknowledged and adhered to a set of institutionalized rules. One can say that conflicts that lead to a temporary consensus are realistic and productive. Productive conflicts could also mean that the conflict parties were able to accommodate both interests so that something changed in the status quo. Productive conflicts are needed to advance decarbonization of the economy and society. To this end, new structures such as ownership or decision-making structures emerge with as few losers as possible.

3. A Framework for Analyzing Conflict Dynamics

To analyze conditions that could encourage productive conflicts Dahrendorf developed a three-dimensional framework [42,47,48] consisting of three empirical conditions for conflict: conditions of organization, conditions of conflict and conditions of change (Table 1).

To specify the framework for local energy conflicts we operationalize each condition into specific aspects and categories that influence local conflict dynamics. These aspects and categories will be presented in the following. It should be noted, of course, that these analytical aspects and categories are interrelated in empirical reality.

Table 1. Framework for analyzing conflict dynamics (own representation following Dahrendorf [42].

Research Question	Examples of Manifestations and Influence Mechanisms	Aspects and Categories of the Conflict
"How do conflicting groups arise from the structure of society?" [42]	Parties, initiatives, associations, etc.; founders, leaders, ideology; technical, political and social conditions	Conditions of organization • Actors in the conflict • Resources and capital • Trust
"What forms can the struggles among such groups assume?" [42]	Forms of action: debate, legal dispute, protest, etc. Regulatory mechanisms Social, spatial mobility	Conditions of conflict • Institutions and governance • Spatiality of the conflict
"How does the conflict among such groups effect a change in the social structures?" [42]	Reinterpretation and restructuring of power relations: Capital, property, decision-making power; intensity of conflict, pressure potential of interest groups	Conditions of change • Change in participation structures • Change in economic structures

3.1. Conditions of Organization

Conditions of organization refer to the social and technical conditions that lead to the emergence of organized and collective representations of interests [42]. They can produce parties, initiatives or lobby groups and be shaped by leaders, ideologies and founding members, etc. Conditions of organization serve productive conflicts if all conflict parties recognize the conflict itself as useful and legitimate. The parties need to be transparent about their motives and interests in order not to drift into unrealistic and destructive conflict constellations [47]. Conditions of organization are operationalized into actors, resources, capital, and trust. They are manifested, for example, in citizen initiatives against wind turbines that merge to form larger regional interest groups, or even political parties [13], and their capacity to mobilize social, cultural and economic capital [15,54].

3.1.1. Actors in the Conflict

In energy conflicts we are faced with a variety of actors and stakeholders, roughly from the three societal spheres of politics, civil society and the market. Antagonistic interests of the different individual and collective actors may lead to conflicts. For residents and site communities land use, quality of life and local value creation are central [55]. The interests of project developers and operators, embedded in the logic of a capitalist market economy, aim at fast project realization and profit maximization. Political actors aim at retaining political power and meeting energy and climate political goals, e.g., through a speedy expansion of the renewable energy infrastructure. Becker and Naumann classify typical conflicting actor constellations in local energy conflicts: e.g., residents that benefit financially from the infrastructures vs. those that do not; local residents vs. non-local investors; new vs. old residents; civic initiatives vs. administrations and/or operators; new market actors vs. incumbent ones [40].

Personal attitudes and the organizational routines and cultures of project developers, as well as strong personal ties and long-standing personal relations and histories, lend a high relevance to the personal level and are decisive for conflict dynamics. It is apparent that citizens' initiatives against wind turbines are becoming increasingly professionalized [13] and are joining forces in regional and supra-regional alliances in order to pool resources and gain greater political weight [56]. Essential to their work and mobilization capacities, in addition to regional networking, are access to economic and social resources [15,57], expertise and the presence of leaders [21]. The initiatives are usually led by people who are highly respected within the local community, either because of their professional position (professors, teachers, entrepreneurs) or because they were already strongly involved in the community [13,21,54]. Some local individuals such as mayors

or farmers frequently play a crucial role in the development of renewables in municipalities [58] and the related conflicts.

3.1.2. Resources and Capital

In energy conflicts the financial resources of the actors vary greatly. Some companies have a lot of capital, some less. Some municipalities are very well endowed, others have hardly any resources of their own in order to undertake action. While there are citizens' initiatives that are provided with generous financial resources by local companies or private individuals, which make it possible to place large-scale and cost-intensive advertisements in newspapers or even commission expert opinions themselves, many initiatives operate with a small budget and rely mainly on small donations and the initiative of their members. Thus, power is decisive for designing and implementing the energy transition [49] and for understanding the dynamics of local energy conflicts. The availability and distribution of capital and resources influences conflict dynamics.

Bourdieu's threefold concept of capital as a means to exercise power helps to address the multiple facets of the influence actors exercise in local energy conflicts [59]. Economic capital appears not only in the shape of money needed to invest in projects or in revenues, buts also in the form of land ownership that puts landowners in powerful positions within local energy conflicts. Kühne stresses that life chances and the opportunity to fight for one's interests is especially evident in spatial conflicts, since, e.g., right to use or rent land can have long-term impacts on individual life chances [39]. The question of owning land suitable for renewable energy production is a crucial one since here one can decide upon things that strongly impact the lives of others (visual impact, change in landscape, etc.) and could even improve individual living conditions through accumulating capital by renting it to renewable energy developers. In their study on community benefits from wind parks in UK Kerr et al. show that community ownership of land suitable for renewable energy generation is a decisive element in local energy conflicts [60]. Besides economic capital, knowledge and social relations are crucial to assert the communities' interest in negotiation processes [60].

Hence, there are more forms of capital that can be mobilized and used than economic capital. Social capital is based on enactment of relationships and mutual acknowledgement of belonging to the same group, whatever this group may be [59]. This includes, for example, establishing long-term relationships with business partners in the wind energy industry, or being on good terms with people in a municipal administration who belong to the same sports club or group of friends. Social capital can help to attract followers for one's own aims. If I am well connected, and equipped with traditional or charismatic authority [61], I am in a good position to gather support for my cause, be it a climate neutral community or preventing wind farms from being built. Citizen initiatives with contact to political actors can significantly influence the institutional framework for renewable energies and therewith exert significant influence on energy political decisions. Strong networks increase the impact of protests and can significantly shift conflict dynamics [56]. Cultural capital in the form of cultural knowledge and academic titles or social capital in the form of social networks and support are crucial forms of capital that ensure authority, help to fulfill one's interests and shape conflict dynamics [56]. These forms of capital can be transferred to one another; meaning that economic capital can be transformed into social capital, for example, or cultural capital can be monetarized and transformed into economic capital [59]. This becomes evident, for example, when citizen initiatives are able to launch media campaigns or hire a lawyer to take legal action against construction permissions [21,54,57].

3.1.3. Trust

Trust, as manifested in resources and actors, is a central aspect of the organizational conditions. There is both quantitative and qualitative evidence that trust in key actors and institutions plays a central role in the perception of renewable energy projects and

local energy conflicts [62–68]. Trust in local stakeholders, for example, can have a positive impact on the perception of fairness [26,62] and stakeholder engagement processes [67,69]. Participation formats may both help to strengthen trust in relevant stakeholders, institutions and individuals and positively affect the assessment of the outcomes [15,68,69]. At the same time they may increase mistrust if participation formats are perceived as unfair [21].

Anthony Giddens defines trust "as confidence in the reliability of a person or system, regarding a given set of outcomes or events" [70] and distinguishes two forms: The first form relates to abstract trust in expert systems (e.g., institutions) or universal symbolic tokens (e.g., money), and is established through faceless commitment where no personal interaction takes place. In the case of local energy development this involves, for example, trust in the general legal system and other rules governing the planning or approval of energy infrastructures, as well as trust in the general framework conditions of the energy market in the context of the expansion of renewable energies.

The second aspect of trust is personal trust in individual actors such as political representatives or individual experts (scientists, professionals, etc.) [68]. This is established through facework commitment based on copresence and interaction. Both aspects of trust are strongly intertwined. Part of this personal trust individual actors receive is derived from trust in the institutions of the abstract systems they represent, while abstract systems depend on the performance of their representatives. Giddens develops five criteria for establishing trust in expert systems. Besides unflappability and "an attitude of 'business-as-usual'" [70], he names credibility, reliability and integrity as main aspects of trust that need to be mediated/conveyed by expert individuals.

So, for example, it may be a matter of personal trust if one knows a specific person in the planning or permission administration well, or even an employee of the company that is to erect wind turbines on site. Beyond that, however, it is also about trust in these people as representatives of an expert administrative or economic body. One trusts the administration to decide according to the appropriate rules. One trusts the local councilors in their professional function to decide in the interest of the community, etc.

For Giddens, the prime condition for the need for trust is not a lack of power but a lack of full information [70]. It is a medium to reduce complexity and to deal with uncertainty in situations where not enough information is available or the information available is very complex [67]. It is thus a key condition for great transformation processes such as the decarbonization, that require radical action facing both high risks and high levels of uncertainties [69,71]. Local energy conflicts, being complex administrative processes involving complex political decision making on various governance levels, are loaded with expert knowledge and build upon information drawn from different scientific disciplines. The information given can usually not be checked, verified or falsified by lay people, but needs to be trusted as being reliable in the sense that it is obtained according to institution-alized rules. While it is indisputable that critical questioning, different perspectives and conflicting facts are needed in any conflict and are indispensable for an adequate problem definition [11,72], a general trust in expert systems, that everything basically follows certain rules, is necessary. There is, for example, a stark difference between climate-sceptic arguments that do not withstand academic peer review (as a common practice in science) and alternative scientifically acknowledged expert knowledge that does not support dominant discourses (see, e.g., [50]).

3.2. Conditions of Conflict

Conditions of conflict address the context in which conflict occurs. They refer to the forms the conflict can take, such as debates, protests or legal disputes, and mechanisms that regulate conflicts. Productive conditions of conflicts are characterized by conflict parties that acknowledge the institutionalized rules of the game and a focus on visible manifestations [47] of the conflict that can be addressed to generate temporary and provisional conflict solutions. Conditions of conflict can be operationalized into institutions, the governance framework and the spatiality of the conflict context.

3.2.1. Institutions and Governance

Institutional frameworks shape socio-technical transitions [73] in as much as they shape local conflicts over these transitions. Institutions, however, are not a set of strict rules, frameworks and organizational structures, but rather are constantly re-enacted by actors that interpret and re-shape them through practice and agency. There is no structure that does not derive from agency, and no agency can exist without the imprint of structures [74]. This view helps us not only understand the context-specific effects of institutional frameworks, but also to focus on the importance of actors and their governance settings in constellations that, at first glance, seem to be strongly formalized. State regulations (e.g., rules on the distance of wind turbines to residential areas or laws on financial participation regarding the installation of wind farms), policies (such as deployment goals or licensing practices) or federal directives (national climate goals and laws), set the scene for local energy conflicts. They are formal institutions in the field of renewable energy development. At the same time rather informal institutions such as community benefits arrangements [60] between project developers and host communities may influence the course of local conflicts, although their impact results from practices rather than from legal requirements.

In addition to these institutions, how problems are addressed and decisions implemented depends on the respective governance constellation of actors in a policy field [75] in general, as well as in the specific local action arena. In terms of multilevel governance this not only concerns state actors, but also policy networks that reach beyond the boundaries of state organizational structures and are scaled differently in the multilevel system [76]. In the multi-level governance of the energy transition, actors and their agency play a role in shaping the institutional policy framework at the EU, federal and state levels. Beyond that, however, agency matters in the formal arena of the site-based institutionalization of the energy transition through planning and approval authorities and their procedures. Governance actors are also important for conflict resolution, for the creation of community organizations and for the discursive framing of the expansion of renewable energies [60,77].

In the German energy transition debate, collaboration between political-administrative, economic and civil-society actors is generally regarded as a prerequisite for a sustainable and conflict-reduced transformation of the energy system. Collaborative governance is seen as a means of reducing conflict and gaining acceptance [78]. This, of course, overlooks the fact that all modes of governance—whether hierarchical state action, market-based action, or cooperative action—can resolve or induce conflicts. Energy conflicts can ignite not only over concrete infrastructure measures, but also over apparent solutions such as community benefits schemes or financial participation measures [21]. New forms of organization, such as the establishment of energy cooperatives or the shift toward communal ownership in the course of remunicipalization [79], can contribute to solving conflicts. They can, however, also be the cause of conflicts.

Conflict intensity is at its peak, Dahrendorf argues, if interests are collectively organized—as in local initiatives against wind turbines—but the political structure does not integrate them as conflict actors [47]. On an individual, subjective level, this shows for example when citizen initiatives claim that they are not taken seriously by their political representatives or local or regional administration The question of how to integrate protest actors in renewable energy infrastructure planning has been addressed by authors focusing on acceptance, on procedural justice or on the critique of acceptance research alike [11,19,26,33,80–82].

3.2.2. Spatiality of the Conflict

A key aspect of the non-linearity of an energy transition is its spatiality [68,83,84]. A phenomenon like the German Energiewende (Energy Transition) could indeed be described as a nation state phenomenon. However, it is ultimately composed of numerous, very different local and regional energy transitions. Regions where opencast lignite mines are located, or where natural gas is produced, have different actor constellations, infrastructural

endowments, and discursive practices compared to the new energy landscapes dominated by wind farms, photovoltaic plants, or biomass cultivation. However, even the new regions of renewable electricity production differ from each other: In many East German regions, wind farms are not owned by the local population and generate less local value added compared to many West German regions [85,86]. A wind farm can thus be interpreted as an object of hatred or the starting point of "colonization" in one region, and as an anchor for economically viable and sustainable rural development in another [4].

Social conflict is embedded in physical spaces [39]. However, local communities are not just affected differently in a physical sense. In addition, value creation and benefits, as well as the negative effects from renewable energies, are also distributed differently across Germany. While locally added value through business taxes, e.g., is high in regions with high shares of locally owned turbines, energy costs are also significantly higher in regions with a high share of renewable energy being fed into the grid. These space-related aspects influence local debates on energy infrastructure and shed light on spatial injustices that affect conflict dynamics. There are huge differences when it comes to the local interpretation and enactment of renewables. In places where wind power is attractive for local communities, minimum distance regulations cause other reactions than in communities with strong opposition. Ambitious or moderate climate goals cause a variety of effects depending on the place and the people involved.

3.3. Conditions of Change

Conditions of change focus on the extent and the location of the changes, the degree of social change and the change in power relations that have been triggered. It is largely influenced by the resources interest groups can muster and what pressure they can put on their counterparts [42]. Conditions of change can range from changes in decision making regimes to regime changes and revolutions. We operationalize the conditions for change in local energy conflicts into changes in participation and in economic structures.

3.3.1. Change in Participation Structures

Participation in the field of infrastructure development was established in order to increase the legitimacy of location decisions and to make these decisions. Furthermore, participation is intended to ensure that location decisions can be influenced by everyone, or at least by public interest groups. The reinterpretation and restructuring of power relations does not lie at the heart of participative governance due to the fact that the formal roles and the rules and conditions of resource distribution are in general not an issue of participation. One could say that these participation processes are "invited participation" in the form of top-down arrangements organized by project developers, planning agencies or academia aimed at pacifying local conflicts [11].

In contrast, however, there are forms of self-organized participation that aim at challenging structural inequalities and power relations within the participation process [11]. Whether participation contributes to change strongly depends on the rules of the game within the institutional framework (How can power imbalances be levelled?), but also on actors (Will project developers and planning administrations do more than necessary?), their power and trust. The success of participation in the sense of a possible reinterpretation and restructuring of power relations thus depends on the respective organizational culture and the will of individual actors to use room for maneuver to pacify a potential conflict. In a negative case, however, participation processes can also be the cause of conflicts over renewable energies that would otherwise not have arisen. This is especially true if procedural justice is not sufficiently observed [21,22,26].

3.3.2. Change in Economic Structures

Economic conditions in local communities are important for the way the installation of renewable energy infrastructures is conducted. Issues of profit from the revenues of the use of the infrastructures and economic power related to land ownership are examples

of the economic characteristics of the socio-material processes of local energy transitions. These economic issues are intertwined with issues of financial participation: How willing are profit making actors to share their revenues among residents and communities as a form of compensation for the burdens? Are there even regulations that ensure this profit benefits the municipalities and citizens involved?

The decentralized installation of renewable energy infrastructure is not automatically associated with decentralized value creation and decentrally distributed benefits. Renewable energy infrastructure differs from other public service infrastructure, such as heat or water infrastructure, in the sense that it does not initially provide a direct benefit to the local host communities themselves. Rural areas in particular are often an "installation space" [87] for profitable renewable energy infrastructure, without the communities in which the infrastructures are located being able to actively participate in their design and value creation.

The question therefore arises whether rural areas are to be mere "installation spaces", to which the task of energy production is 'handed over' by external planning and investment decisions—with all the positive and negative consequences for regional economic power as well as the transformation of landscapes—or whether they are to be actively shaped by the actors. The shaping of the energy transition refers not only to the physical-spatial aspects of infrastructures and landscapes, but also to social or economic questions: Is it only the external investors who profit from the energy transition or also the local population? Are there efforts to increase the number of community owned energy infrastructures or of energy cooperatives [65,66,88,89]? Do questions of distributional energy justice [87,90,91] play an adequate role? Solutions for a more equitable distribution of wind power revenues [88,92–94] between landowners, operators, and affected communities and residents seem necessary in order to shape the transformation processes in the context of energy transition in a way that the generation of profits does not lead to destructive conflicts. New technical solutions for sector coupling also offer further opportunities for local profit.

4. Methodology and Case Selection

To analyze the dynamics of local energy conflicts a qualitative, case study-based research design [95] was chosen. The cases studies were conducted on municipalities in Germany where wind power projects were in the planning or development phase. The aim was to contact experts involved in the energy conflict, predominantly mayors and project developers. The analysis is based on 13 semi-structured interviews. They included large narrative sections to obtain detailed insights into the respondents' perspectives on both wind power and renewable energy in general, and the development of the local project in particular. Each interview was between sixty and ninety minutes long. In addition to the interviews, local newspapers served as an important source for background information and a qualitative media analysis. Furthermore, participatory observation took place at information, participation, or mediation events in the municipalities [96]. A field diary was kept that captured the atmosphere and first impressions of the encounters [96]. The data was coded according to Flick's approach of thematic coding [97], which proves suitable for case-based analysis and in order to "assess the social distribution of perspectives on the issue under study" [97].

The five cases were selected based on their current state of conflict (Table 2). We aimed at a diverse sample that included both cases of destructive and productive conflicts and various degrees of conflict intensity. All the municipalities are located in rural areas in Germany. We have pseudonymized their toponyms and only use these pseudonyms in the following.

Table 2. The selected case studies.

Municipality	Summary	Type of Conflict
Himmelhausen	Himmelhausen is a municipality in which the local council decided to have wind turbines erected within its environs. The area is partly owned by the municipality and by the state. A citizen initiative against wind turbines was formed from which a local political party and a nature conservation organization emerged. The project was halted due to massive resistance and moved to the neighboring community. After more than ten years the case is still pending. In the course of the legal process, the project has been downsized to two wind turbines. In late 2021 the annual financial compensation for another neighboring wind farm was offered to the municipality, but this offer was declined.	Destructive conflict
Niederberg	Niederberg hosts a repowering project of eight turbines, with three standing on municipal land. It is the first municipality in which a state law for mandatory financial participation for municipalities and residents came into practice. The municipality decided against financial participation and only a few entitled residents decided in favor.	Destructive conflict
Weggendorf	Weggendorf opposed the plans for a wind farm built on land of the local agricultural cooperative. After a change in legal regulations that allowed for innovative solutions that benefited the municipality, the mayor supported the plans.	Conflict turned constructive
Salmern	Salmern was one of four municipalities in the respective state in which a jointly operated community wind farm was planned. After legal objections from residents and nature conservation groups, from an initial 19 planned turbines, 12 are now either in operation or still in the licensing process. In Salmern, the mayor had been a vigorous opponent of wind energy and dropped out of the municipal wind farm. However, attitudes changed after positive experiences with a new project developer that developed a solar park in the municipality and with neighboring municipalities profiting significantly from renewable energies.	Conflict turned constructive
Siebenhagen	Siebenhagen hosts 16 wind turbines. Most turbines are built on municipal land. The revenues through land lease are significant and the municipality itself owns two turbines. The project has been developed in close cooperation between the municipality and the project developer and is now jointly operated by the municipality and a regional energy supplier.	Constructive conflict

5. Case Studies of Rural Energy Conflicts in German Municipalities

5.1. Himmelhausen: A Destructive Conflict

In Himmelhausen the municipal council wanted to actively engage in renewable energy installation. Initially there had been a motivated group consisting of local council members and active citizens that advocated wind power in the municipality. An energy cooperative already existed and the municipality had been active in climate policies before. The community is located in an economically strong region. Furthermore, the municipality owns part of the land that is designated for wind power development, giving the municipality significant power over what will happen there. The mayor placed considerable emphasis on a transparent process. The municipality was informed regularly and the whole process is documented on the municipality website. The public was regularly invited to the local council meeting, in which the state of the process was discussed and objections could be raised. The project developer was chosen on the basis of their experience of wind energy in forests and their proposals for financial participation and citizen involvement in the planning process.

Shortly after the project developer was chosen a citizens' initiative against wind turbines in the municipality was established. Founding members were respected personalities in the community, such as a professor and local entrepreneurs. The citizens' initiative was well endowed as active individuals could not only draw on substantial private financial resources, but were also able to issue large advertisements in local newspapers. They organized large counter events for which they invited speakers from across Germany. The citizens' initiative also drew on social and cultural capital in the form of far-reaching networks and highly respected leading figures within the local community that where rhetorically very strong and dominated debates. A local party was founded for the upcoming local elections that emerged from the citizens' initiative against wind turbines and became the largest party on the municipal council.

When the conflict started to escalate the initiative called for a public mediation process between the opponents and proponents of the wind farm. It was agreed upon and the local council supported the process. In the public mediation meetings, the citizens' initiative drew on personalized and emotionalized rhetoric to undermine the trust in the supporters of wind power. They stressed that the project developer was a fraudster and that the project would never be economically successful. These arguments, coming from entrepreneurs and a professor, were very important in the first phase of the conflict. The representatives of the citizens' initiative did also not shy away from personal accusations and counterfactual claims.

The mayor and the citizens in favor of wind power tried hard to ensure a maximum of transparency and fact-based knowledge (e.g., with regard to climate change, energy transition and the impacts of wind turbines). While these actors were also well-known and respected residents, they showed signs of resignation over the process. They also stated that a rational and fair debate was not possible anymore and withdrew from the process before a consensual paper could be drafted. They claimed that the initiative did not show any signs of compromise and that their only goal was to prevent the wind turbines from being built. The project developer was invited as a guest to all meetings. After physical threats he decided he would no longer be present at the mediation process.

Financial participation opportunities for residents and the municipality had been a prerequisite in negotiations between the project developer and the local council. This did not lead to more acceptance, but instead to more mistrust, as the citizens' initiative claimed that the project developer was not a trustworthy business partner and that the project could never be economically profitable. The state government supported the expansion of wind energy, however, there were no special rules on financial participation. Since 2021 a federal law has provided project developers with the opportunity to compensate municipalities. Based on this, the municipality was offered annual compensation payments for a wind farm in a neighboring municipality. This was also declined by the then-acting local council. Besides allegations of fraud and economic malinvestment, nature conservation claims

were also strong within the initiative. The forest serves as a designated recreational area. Its importance for the residents was often stressed. Furthermore, the red kite becomes a symbol for the struggle against the wind farm, as is often the case in anti-wind protests in Germany.

The energy conflict in Himmelhausen can be interpreted as a destructive conflict. It did not lead to a temporary consensual solution in which both conflicting parties had their interests reflected. The citizens' initiative did not acknowledge the interests of the other conflict partners in economic progress, communal value creation, or activities to mitigate climate change. Himmelhausen also illustrates the importance of trust and the impact of seeding mistrust in local conflicts. A small group of prominent local figures were able to influence a conflict in such a way that it not only ultimately impeded the project, but also caused massive rifts in the social relations in the local community.

5.2. Niederberg: A Destructive Conflict

Niederberg hosts a repowering project of eight turbines, with three having been erected on municipal land. In general, the mayor and the municipal administration are very supportive of renewable energies; they even plan further municipally initiated projects. For the mayor, who was only recently newly elected, participation opportunities are a necessity for implementing the German energy transition. However, the mayor feels overwhelmed by the complexities of the task having only an honorary mandate and resources are very restricted when it comes to making informed decisions. He explains that it is difficult for him to push new projects or to gather the necessary information and partners. Though the municipality owns the land where the repowering takes place, the rental contract was signed by the previous mayor. The mayor is dissatisfied with the amount of rent as he subsequently found out that the rent the municipality receives is significantly lower than the usual amount.

The project developer, who is mandated to carry out the repowering project, and thus the first implementation of a new participation law in the state, is a municipal energy provider from outside the region. The mayor claims that there has not been any contact with the project developer, he does not receive information about the recent developments. Though the turbines had already been in test operation the mayor did not know when the offer would be announced, or what it would look like. Consequently, from the side of the mayor, there is no trust in the project developer. With a lack of trust in the contract partner and a lack of expertise and resources to make an informed investment decision in the interests of the municipality, and thus generate added value, is difficult.

Niederberg is the first municipality where a state law on mandatory financial participation has been put into practice. The state is very supportive of the project and the project developer, aiming at making it a lighthouse project for local financial participation in wind power projects. Being the first project to implement the new law, there are currently no established routines on how to put it into practice. However, the following examples show that it is not only a matter of institutions, but also a matter of agency when it comes to how one operates with the given frameworks.

To inform the public about the different financial participation opportunities an event was organized in which the project and the investment possibilities where introduced. There had been no additional information or exchange events for the local municipality. The participation process resulted in a rather sobering experience. The host municipality did not make an investment in the wind turbines due to financial constraints. Only one other neighboring municipality did. Out of about 5600 eligible residents, only 20 invested. The project operator is cited as stating that the costs of the participation process far exceeded the local investment.

The conflict in Niederberg can be seen as a conflict without productive outcome. The interests of the conflicting party were barely taken into consideration, the institutional framework and legal requirements did not facilitate the municipality in bringing their interest in more communication and transparency to the fore. Financial participation in the

form of requisite investments does not seem to be a driver for a more productive conflict, instead it has the potential to reinforce structural inequalities between companies and municipalities that are economically weaker.

5.3. Weggendorf: A Conflict Turned Constructive

In Weggendorf the licensing process for a wind farm is currently underway. A specific site has been designated as suitable for wind energy development by the regional planning authority. The owner of this area is a local agricultural cooperative. Nevertheless, the mayor is very critical of wind farm development within the borders of the municipality and the atmosphere in the local community is quite negative towards the installation of new wind turbines. During the regional planning procedures many objections were articulated from within the community that eventually led to the rejection of one site within the borders of the municipality due to nature conservation concerns. However, one site remains. Although many residents have attended information events organized by the regional planning authority, and many residents opposed the designation of land in their vicinity, there is as yet no active citizens' initiative against the development as such.

Although very critical of wind power development, the mayor remains constructive when it comes to aspects such as legal regulation, and acknowledges—not owning the land—that the municipality has no means to prevent the project. He states that if he cannot prevent it from being built, the municipality has to make the best out of it. The mayor has a very clear opinion on the conditions under which he would endorse such a project. Financial benefits are not in the mayor's interest, rather, he argues for substantial infrastructural development that goes far beyond regular benefit schemes. However, he felt deceived in the early stages of the project planning. The project developer suggested various options for benefitting the community, such as charging stations for electric vehicles, that did not accord with the mayors' key interest in a new bypass road. There was a conflictual relationship between the mayor and the developer and the head of the agricultural cooperative during the first field visit. The head of the cooperative claims that his company depends on the additional income in order to keep the cooperative economically stable. The personal relationship between the mayor and the landowner, a local farmer who provides jobs in the local community and used to do substantial voluntary community work, suffered heavily at that time. After years of negotiation the relationship between the mayor, the local land owner, and the developer was very tense and not only defined by mutual mistrust but outright anger. In this case, the project developer is a local company that works together with the regional energy supplier.

In the course of the conflict a new company was added to the project consortium that aims at developing an innovative power2X plant. New legal regulations have paved the way for these innovative projects in the field of sector coupling that have assisted the project developer, together with other partners, in planning an energy infrastructure development beyond mere wind energy generation. The project operator offered to develop of small scale "energy factories", where wind power is directly transformed into hydrogen and e-fuels, to the local community. This project would enable the demanded road infrastructure to be realized. Financial benefits play no role in their argumentation, not even prospective business taxes and jobs resulting from the energy factory. For them, individual and eventually "unconventional" solutions for locally added value are the key to raising community acceptance.

Through these changes, it is ultimately a conflict that has developed productively. The initial strong opposition from the community was based on the fact that the community's interests were not adequately considered. However, formal institutional changes in the general legislation then allowed for other forms of economic value creation beyond pure energy production. For the community, this means more value creation, and the landowner receives the necessary lease payments. The technological development towards sector coupling and the associated institutional innovations increased the will to cooperate among all parties involved and consensual solutions could be found.

5.4. Salmern: A Conflict Turned Constructive

The energy conflict in Salmern concerns a number of existing renewable energy projects. More than ten years ago, a community wind farm was planned that aimed at shared ownership by four neighboring municipalities and a regional energy provider. Initially, Salmern was part of the project, but dropped out after a new mayor was elected. At the time of election, the mayor was a vigorous opponent of the wind farm. He also used to be active in a citizens' initiative strongly arguing against wind turbines. In the municipality the mayor looks after the interests of the residents and the social infrastructure. He is well respected and is a strong voice for the municipality's interests. Hence, the atmosphere in the local community towards wind turbines developed in a rather negative and critical direction. Given the mayor's general opposition to the project, his focus was on preventing all wind energy development in the vicinity, especially given the fact that it was within the vista of a newly planned residential area. He was afraid that the building plots would not be sold if there was a wind farm within sight. In course of time the community wind farm—now consisting of just three municipalities—was constructed; despite this there were no problems selling the building plots and developing the houses.

There is a sense of distrust on the part of the mayor towards the investor. He does not feel taken seriously and accuses the developer of not being fully sincere. Furthermore, he states that he could even imagine supporting such a project if there was another developer who the municipality could work in a better and more productive way. Consequently, the mayor is not against renewable energy in general. He explains that the burden of wind turbines would be "easier to bear" if the municipality were to profit directly. At the same time, the municipal council aims to install solar panels on a municipally owned field near a railway line. Therefore, the mayor sought contact to another project developer, who was already active in a municipality in the region and who was known for generous participation models in favor of this municipality. Here, the mayor states that there is a good and respectful relationship and is very proud of the project that promises the municipality extra income. While the local council developed local land-use plans for institutionalizing the solar project, resistance within the village arose. A number of individuals distributed flyers against the solar project. The mayor recalls that he went directly to the protagonists to talk to them, to explain the project and to make clear to them that he is not willing to accept any false information being distributed in the local community. He claims that this ended opposition to the project. This example shows that the mayor has significant social capital and charisma when it comes to convincing the municipality of his arguments. It was the mayor's actions that both led to opposition to the wind farms and ended opposition to the solar project.

Furthermore, another long-planned wind farm in the neighboring municipalities started to materialize. It became clear how much profit the neighboring municipalities could make from either being part of the community wind farm or developing wind turbines on municipal land. The mayor admits that more and more municipalities around Salmern profit from wind power and now openly regrets the decision to drop out of the community wind farm years before. He even asked the project developer to re-involve the municipality in further projects. He also requested that the regional planning authority re-include a formerly designated area for wind power development in the regional plan. It had been previously removed due to the mayor's opposition. The municipality is now even eligible to participate in another wind farm project.

The municipality made its own specific and self-determined steps for more renewable energy production. In this respect, the municipality not only has land over which it can decide, it also has the power to voice and assert its interests. Trust or a relationship with project developers played a role at various stages in the process. The mayor dropped out of the community wind farm because of a bad relationship with the project developer. Over time, experience, both with financial participation in renewable energy projects and project developers, changed. The relationship with the project developer from the municipality-initiated solar park is reportedly good and based on mutual trust. It shows that the ability

to act and to make one's own decisions about project partners is important for developing trustful business relationships.

Trust in institutions and processes is also apparent in the municipality's request to re-enter the community wind farm. In general, the community wind farm was considered a lighthouse project in the state for municipality-based wind power development. However, only after the state law on financial participation brought visible benefits to neighboring municipalities and to the municipality itself, did this also help to positively engage the mayor with wind turbines also on municipal land. A destructive conflict turned productive. An essential spatial reason for this development was the positive development in Salmern's neighboring municipalities.

5.5. Siebenhagen: A Productive Conflict

Siebenhagen hosts a wind farm with 16 turbines. It is jointly owned by the host municipality and a regional energy supplier and has been developed in close collaboration between the two. The mayor is highly motivated to generate substantial income for the municipality. He is outspoken and highly respected in the local community. He recalls an incident where a group of anti-wind activists from neighboring villages came to an information event on the planned wind farm. When the activists started questioning the project in an unconstructive, polemic way, they were "kicked out" by the residents. Since then, no further attempt to form a local anti-wind initiative in the village have emerged, even though neighboring initiatives tried to disrupt the process. The wind farm developer was chosen by the local council. The developer focuses on strong local value creation in all his projects; the company is operator of many of these projects, not only serving as a developer who works on behalf of other companies or investments funds that do not usually engage with the needs of the host municipality. Besides offering substantial financial participation and ownership schemes, the developer also places great emphasis on collaboration with the local council and on information for the residents. For example, the municipality was able to discuss the number, height and placing of the turbines within the wind farm. The municipality was able to argue for a certain shape and for not planning the maximum possible height, but rather somewhat lower in order to minimize the visual impact of the installations. Due to these advantages there are no important actors in the local community that are actively against wind turbine development. The municipality owns most of the land where the wind farm was planned. Initially, these portions of land were not designated as an area formally suitable for wind energy development, so that the regional planning authority had to make an exception for this municipality in order to reward their positive engagement. This shows how the productive management of local conflicts can lead to governance actors in the multi-level system even adjusting their formally institutionalized regulations—in this case in the field of regional planning.

As an owner of the site, the municipality was able to choose their business partners and negotiate with project developers to gain the best conditions for the municipality in terms of procedural and financial participation. As a result, besides owning the municipality's own turbines, their percentage of shares in the turbines is higher than required by the state law. Additionally, the municipality took over their share of the wind farm after construction and testing and, therefore, did not have to take any risks in the construction phase. As a landowner, the municipality receives a fixed annual monetary amount from the lease of the land, regardless of the wind farm's productivity. This not only generates significant and secure municipal income, but it also makes investment less risky. The mayor is a highly influential person in the local community and very determined to bring added value to the community. This gives them the power to prevent anti-wind initiatives gaining ground. This is true even though they are very active and frequently dominate local politics in the villages around Siebenhagen.

Within the local community there does not seem to be any mistrust between residents and key stakeholders such as the mayor and the project developer. The latter are very committed to bringing the project forward and faced significant initial difficulties with

the licensing authorities within the governance system. Both the mayor and the project developer described their relationship as very friendly, constructive and trustful. Developer and mayor both stated that it was their mutual trust and close business relationship that was crucial in convincing the planning authority to make the exception.

The specific spatiality of the situation preventing a potential conflict was characterized by a key figure (the mayor) who was able to contribute municipally owned resources (the land) in order to assert local interests. Putting a municipality in a strong position to act in terms of resources and capital seems to be a good starting point for positively dealing with potential conflicts around renewable energy expansion. Here, community capital and trust lead to a maximization of community benefits and created a local lighthouse promoting wind power as a source of community benefits in the region.

6. Discussion

In the following, we discuss productive conflict conditions based on the basic conflict aspects and categories from the framework presented in Section 3.

Local energy conflicts are not only numerous, but also highly diverse. Each of the five cases presented in this paper is in itself specific and individual. While institutional or spatial contexts might be similar across landscapes or states, actor constellations, personalities and communities are specific, dynamic and highly complex. Local histories interfere with social relations and structural conditions. These aspects are not easy to grasp. Nonetheless, some elements are present in almost all local energy conflicts. Depending on the case, some elements are more dominant than others, however, we argue that they all have explanatory value for understanding local energy conflicts. They are also entry points for constructively dealing with the conflicts.

The decarbonization of our energy systems takes place in specific socio-spatial constellations. Rural municipalities are emblematic spaces for the success of an energy transition towards renewable energies. Our case studies have shown that this will not take place without conflicts, but that there are opportunities for turning these conflicts into productive ones. With our conflict-theoretical perspective informed by sociological theory, especially Ralf Dahrendorf's, we could see conflicts as a constitutive aspect of the socio-technical transition processes taking place at the level of municipalities in rural Germany.

The case studies showed that the actors in the conflict, with their personal attitudes as mayors, project developers or members of citizens' initiatives, are decisive for conflict dynamics. The personal level is an important condition for the organization of productive conflicts. Conflicts can run along different lines: between the developer and the municipality (here the mayor often serves as the essential contact person or negotiation partner), between the municipality and the regional planning authority, between municipalities and landowners and so on. In order to understand the conflict dynamics, it is indispensable to understand the role of the "human factor" in the networks and processes of renewable energy development. Mayors, often charismatic leaders, play an essential role in determining whether a conflict can be transformed from destructive to productive, or whether a conflict remains path-dependent and there is no way out of its destructive trajectory. As persuaders, these key figures [98] can leave their mark on the development in a community, whether as proponents, opponents, or skillful exploiters of the opportunities offered by an energy transition.

Some conflicts are destructive primarily because populist positions have gained ground. Actors then often argue in a personalized fashion and advocate anti-elitist, anti-democratic and/or anti-scientific positions [53,99]. Conflicts will remain destructive when untruths are spread, such as the denial of man-made climate change. However, we have also seen cases where these voices were present, but could not prevail. Here, these actors could not mobilize their capital and were not seen as leaders and the majority of the respective population trusted other actors. When conflicts become productive, however, this does not necessarily lead to a strong expansion of renewable energies. As we see in Siebenhagen, the number and height of the turbines was reduced, and with this the

capacity for energy generation. However, the interests of both the community and the project developer were considered.

Our examples have shown that resources and capital play an enormous role in the conflicts. In particular, the question of who owns the land on which wind farm development is to take place is eminently significant. If, for example, municipalities can act as land owners, this increases their opportunities to appear with a strong position in the procedures and negotiations. They can improve the conditions for greater municipal participation in the procedures or push for new solutions with greater value creation (especially in the context of sector coupling). However, in some cases, the municipality owns only parts of the land (e.g., in Niederberg) or none at all (e.g., in Weggendorf). As a result, it has no possibility of intervening in the selection of the project developer and hardly at all in the project design (only indirectly via land use plans). Furthermore, land ownership can also strengthen the position of private actors, whether for or against the construction of the wind turbines. Resources and land ownership are a positive prerequisite, but can also be used to obstruct, as in Himmelhausen.

Himmelhausen also shows the importance of trust and the significance of fostering mistrust in local conflicts. A small group of prominent local figures were able to influence a conflict in such a way that it ultimately blocked the project. Trust and social capital are seemingly soft factors. They are of enormous importance and impact in local energy conflicts. Trust between mayors, landowners, and project developers is an important aspect that can also be changed in the course of a conflict. Trust can grow when examples perceived as positive are realized in neighboring communities, when conditions for financial participation improve, or when new infrastructural solutions are tested that benefit multiple stakeholders. On the other hand, with a lack of trust in a contract partner and a lack of expertise and resources to make an informed decision, it is difficult for a municipality to make an investment decision in its interests and generate added value [100].

The conflicts are always embedded in specific spatial situations. Their social dynamics turn the spatial environment of a wind farm development into a socio-spatial setting. The geographical uniqueness of each socio-spatial setting co-defines the conditions of conflict in a specific way. For example, if it is a community in a saturated region, this increases the opportunities to use financial and social capital for local wind farm development—or to use the capital for obstruction. Local conflicts must be linked back to state and federal policy decisions in order to be institutionalized, for example in planning or energy law. However, conflicts cannot be controlled or predicted solely through the institutionalization of conflict resolution and develop their own dynamics, which depend on both their structural and organizational context [15,101]. Even supposedly optimal conflict conditions are no guarantee of constructive resolution, but must always be seen in interplay with the local organizational conditions [13,21].

An institutional framework and legal requirements for financial participation in the revenues of wind farms are an important prerequisite for turning destructive local conflicts into productive ones. They facilitate the municipality in bringing their interests for more economic welfare to the fore [92]. However, here too, as our analyses have shown, it depends on the individual case: Financial participation does not necessarily serve as a driver for a more productive conflict, sometimes it even has the potential to reinforce structural inequalities between stakeholders in the conflict [100]. Individual and collective agency in dealing with formal rules, whether in planning law or financial participation laws, is a major factor in conflicts. If the legal impulses are communicated and perceived as an opportunity to improve living conditions in the community, they can contribute to a productive course of the conflict.

The conditions of change in terms of participation and economy are important for understanding the conflicts. However, as our case studies have shown, these conditions of change only develop their meaning in the context of the previously discussed conditions of organization and conditions of conflict. In contrast to the understanding of acceptance research, participation is not the sole key to the "success" of conflict resolution, but an

arena for conflict dynamics. Whether participation contributes to change strongly depends on the rules of the game within the institutional framework (how can power imbalances in the procedures be levelled?), but also on the actor constellations (will project developers and municipalities collaborate?) and their mutual trust. The institutionalized structures of participation should allow every interested citizen to take part in the political process of renewable energy development.

7. Conclusions

The paper offers a three-dimensional framework to analyze local energy conflicts. It consists of seven categories that are important to understand and explain local energy conflicts. At the same time, the framework with its wide range of analytical aspects should allow for openness in order to be able to grasp the complexities and individual conditions of empirical cases and their dynamics. With the help of the framework, it is not possible to predict whether a conflict will develop in a productive way or whether it will become destructive. Nevertheless, it offers an opportunity to explore possible courses of conflict.

With respect to conflict aspects in the empirical field of renewable energy expansion, we have identified positive and negative conditions. These are summarized in Figure 1.

Conditions of conflict in local energy conflicts

Productive conflict
- Community ownership of the construction site
- Supportive actors in the local council (esp. mayors)
- Open-minded project developers (participation, trust, collaboration, etc.)
- Legal certainty of land use planning (e.g. regional planning)
- Options for local value creation and community benefits
- **Space and power for negotiating interests of the host municipality**

✓ Problem-solving orientation
✓ Willingness to compromise among conflict actors
✓ Recognition of opponent's interests

Unproductive conflict
- External landowners with no attachment to the local community
- Strong opposition in the local council
- Active anti-wind initiatives
- Project developers that do not engage with local community / only do what is legally required
- Unclear status of land use planning (e.g. regional planning)
- No benefits for community and residents
- **No space for municipalities to argue for their interests**

❖ Destructive conflict development
❖ No willingness to compromise among conflict actors
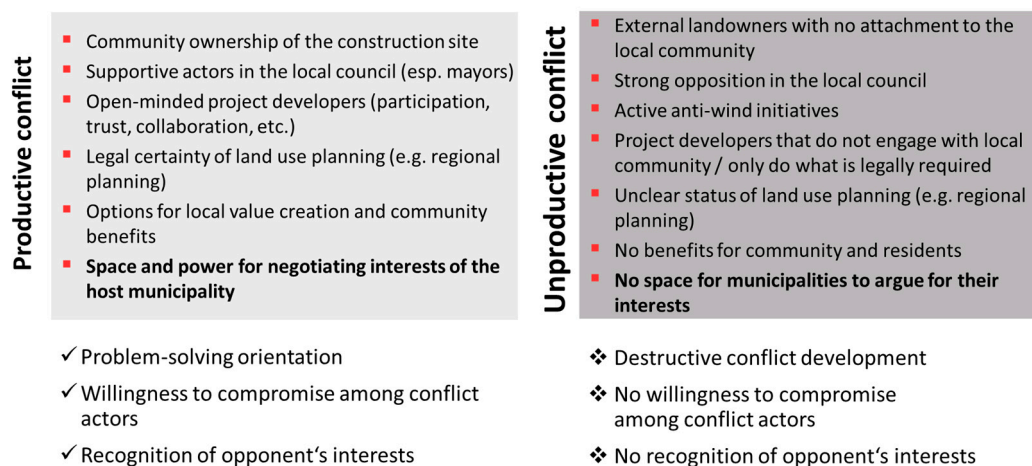❖ No recognition of opponent's interests

Figure 1. Local conflict conditions in the development of renewable energy infrastructures. Source: Own representation.

These conditions can certainly be influenced and managed, so that there are opportunities for a constructive outcome to these conflicts. To manage local energy conflicts the relationship of the actors, their experience and willingness to engage with each other are most crucial. Awareness of community interests and a desire to involve relevant local actors in planning and operation is central to the course of the conflict. Project developers who refuse to engage in a dialog with local communities and residents trigger mistrust and are criticized for their non-transparent approach. At the same time, there must also be a willingness to collaborate with project developers on the side of the municipality. This is more likely to be the case in communities where the population and community representatives have a fundamentally positive attitude toward wind turbines than in communities that are critical of wind power. If citizens' initiatives against wind power plants are active in the communities, these additionally strengthen the effect. Recognition of the rules of the game, i.e., the legal framework, as well as a benevolent acknowledgement of the interests of the respective counterparts, are hardly to be found in such constellations and make it more difficult to deal constructively with the conflict.

However, further research has to be carried out in order to gain a deeper understanding of how to productively deal with local energy conflicts. The need for further research arises from the gaps in our analysis and the other considerations documented here. In

particular, it would be important to place more focus on the role of participation and financial involvement as conditions of change, now that conflict dynamics related to personal factors as well as the conditions of the institutional framework can be better understood. In this context, it would be important to discuss the aspects of participation in both procedures as well as revenues from the financial income from renewable energy production, however, not as schematic solutions for gaining acceptance, but as aspects among several others which can change conflicts into productive conflicts.

To this end, we have provided our results from the present study. A stronger systematization of institutional frameworks (e.g., according to the federal states regulations, to the planning requirements of regional planning authorities, or according to national energy policies) would also help to gain an understanding of which institutionalizations and forms of governance are particularly promising in terms of shaping productive conflict processes. Finally, it is necessary to broaden the conflict-theoretical perspective to include aspects of justice. Recent approaches to energy justice highlight the importance of distributive, procedural and recognition justice in social scientific energy research [91,102,103]. While much research has been done that reflects on financial and procedural participation in the light of distributional and procedural fairness [18,22,26,28,60,62,80,104], a critical perspective that includes aspects of recognition justice and structural injustices is still lacking [105]. Combining our conflict theoretical perspective with these justice dimensions would help to understand local energy conflicts even better.

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