



Original research article

To wind up changed: Assessing the value of social conflict on onshore wind energy in transforming institutions in the Netherlands

Annemiek de Looze^{a,*}, Eefje Cuppen^{a,b}^a Leiden University, Faculty of Governance and Global Affairs, Institute of Public Administration, P.O. Box 13228, The Hague, Netherlands^b Rathenau Instituut, Anna van Saksenlaan 51, The Hague, Netherlands

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ABSTRACT

The energy transition is a complex challenge involving technological, political, behavioural, and social transformations. In this transition, social conflict frequently occurs regarding disagreements over how, when and where energy should be produced, transformed or transported. Recent literature argues for the potential value of social conflict when conflict is used to draw lessons and improve policy and projects to fit with the concerns of stakeholders. However, research in which the actual positive repercussions of multiple social conflicts are evaluated on a systemic level is lacking. In this paper we aim to empirically investigate if and how social conflict leads to institutional change. Our first research question is how institutional change as a result of social conflict can be assessed. To answer this question, we develop a framework combining the Ecologies of Participation framework with institutional change literature to evaluate the value of social conflict on institutional change regarding the objects (the 'what'), subjects (the 'who'), and models (the 'how') of participation. We apply this framework to the case of onshore wind energy in the Netherlands. Through a document analysis and semi-structured interviews, we answer the second research question: (how) did institutional change result from conflict occur for the Dutch transition to onshore wind energy between 2013 and 2022? We present our findings on which institutional changes occurred and discuss the dynamics allowing for or hindering institutional change. Our research contributes to a growing necessity to combine a systemic analysis of complex socio-technical processes with concrete measurements of change.

1. Introduction

To minimise global climate change, there is a need for a transition from the current fossil-fuelled energy system to a system based on renewable energy sources. This is a complex challenge which not only involves technological transformations, but also political, behavioural, and social changes concerning a wide variety of stakeholders [1–3]. Energy research, policy, and practice are increasingly shaped by the idea that public acceptability and engagement with the energy transition are required to improve the depth and speed of the energy transition [4–6]. This focus on citizen acceptance of renewable energy projects is a response to social conflict in which stakeholders such as policymakers, energy producers, and citizens disagree on how, how much, when, and where renewable energy should be produced [7]. Such conflict is unavoidable and inherent to the process, especially in the transition to onshore wind energy, due to the spatial impact of wind turbines on the landscape and the wide diversity of perspectives and values among

stakeholders. A common policy response is therefore to be conflict-averse [8].

Nonetheless, a growing stream of academic literature is viewing social conflict in relation to potential socio-technical change [9]. Here, conflict is regarded as a form of participation [10], namely self-organised participation [7], in which citizens voice their concerns over the incompatibility of their objectives with the objectives of policymakers or project developers. Although social conflict may potentially hinder the development of the energy transition, there is an increasing call for understanding conflict as a valuable source of learning [8,11]. This perspective acknowledges power and antagonism as fundamental 'political' attributes of the public sphere [12]. Instead of taking power for granted as it is, space is needed within democracy for open participation and 'conflictual consensus' in which a diversity of viewpoints, expectations, values, and demands are heard and taken into account in decision-making [9,10,12–14]. Social conflict is then seen as not just being caused by certain institutions – the rules, policies, norms, and

* Corresponding author.

E-mail address: a.m.m.de.looze@fgga.leidenuniv.nl (A. de Looze).<https://doi.org/10.1016/j.erss.2023.103195>

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values – that are incompatible with societal values and demands, but also having the potential to influence these institutions and change them [8,14]. Conflict should therefore not be avoided, but rather engaged with in such a way that it yields these positive, productive results [8,11].

Social conflicts are not isolated events, but rather impact each other and they may have spill-over effects on each other [15]. Although several studies have contributed to the idea of the “value of social conflicts”, research in which the actual positive repercussions of social conflict on a systemic level are evaluated is lacking. Instead, studies typically provide general remarks on how conflict can have potential positive consequences on policy [11], look at ‘critical moments’ of change [9], or focus on the context of single conflicts to argue for the value of social conflict [15]. However, there has been a call for studies that look into the role of conflict in orchestrating change [16] and we see the importance of developing a method to empirically assess if and how multiple social conflicts may jointly contribute to institutional change, both in the formal policies and procedures as well as in the informal societal norms and values that inform these formal institutions. We aim to answer two research questions contributing both conceptually and empirically. First, how can institutional change as a result of social conflict be assessed? Second, how did such institutional change resulting from conflict occur for the Dutch transition to onshore wind energy between 2013 and 2022?

In the next section, we elaborate on our conceptual framework, combining theories on backflow and institutional change with the ecologies of participation framework [17]. Section 3 then describes the methodology used to empirically apply the framework. Section 4 provides an overview of the institutional change observed for onshore wind projects in the Netherlands as a result of conflict. Section 5 consists of a discussion of the results and the conceptual framework, after which Section 6 provides a conclusion to the research.

2. A framework for evaluating conflict powering institutional change

In this section, we introduce our conceptual framework (Fig. 1) by combining theories on institutional change with the ecologies of

participation (EoP) framework. Building a framework is necessary to help account for the complex relationship between conflict and change. Additionally, we use the framework to empirically assess change resulting from conflict and to delineate the types of changes we investigate. All the theories and elements that we combine in our framework build towards this lens through which we analyse institutional change resulting from conflict.

2.1. Institutional change

Our conceptual framework builds on the theoretical framework of overflowing and backflowing as presented by Pesch et al. [18], drawing upon Callon [21]. According to this framework, there is a set formal trajectory of assessment, or the “prevailing sets of rules that are part of dominant institutional practices” ([18], p. 826). This for example includes the (legal) procedures and policy plans, but also entails standards and tools used to assess the collective value of (energy) projects [18]. When this formal trajectory is no longer in line with the current social acceptability, norms and values, and demands from stakeholders, it may ‘flow over’, i.e., give rise to social conflict or other forms of self-organised participation in which citizens advocate for adaptations to the formal trajectory of assessment (top arrow in Fig. 1). Citizens might for example protest against a certain energy project, or they may more broadly advocate for the inclusion of underrepresented actors in the creation of the formal assessment trajectory. This representation of alternative claims, values, and demands is called the informal trajectory assessment [18]. If in turn this informal trajectory assessment leads to changes in the formal trajectory assessment, backflowing or ‘institutional change’ happens (bottom arrow in Fig. 1). Backflowing implies that there is a learning process, as the newly voiced values and objectives are channelled back to the formal trajectory of assessment to alter the institutions in such a way that (some of) these objectives are now embedded within the foundation of the system. The idea that previously unrepresented objectives ‘flow back’ to the institutional structure of the system implies that there is value in social conflict: the lessons learned from these conflicts and the perspectives articulated receive a place in the formal and informal institutions of the energy system.

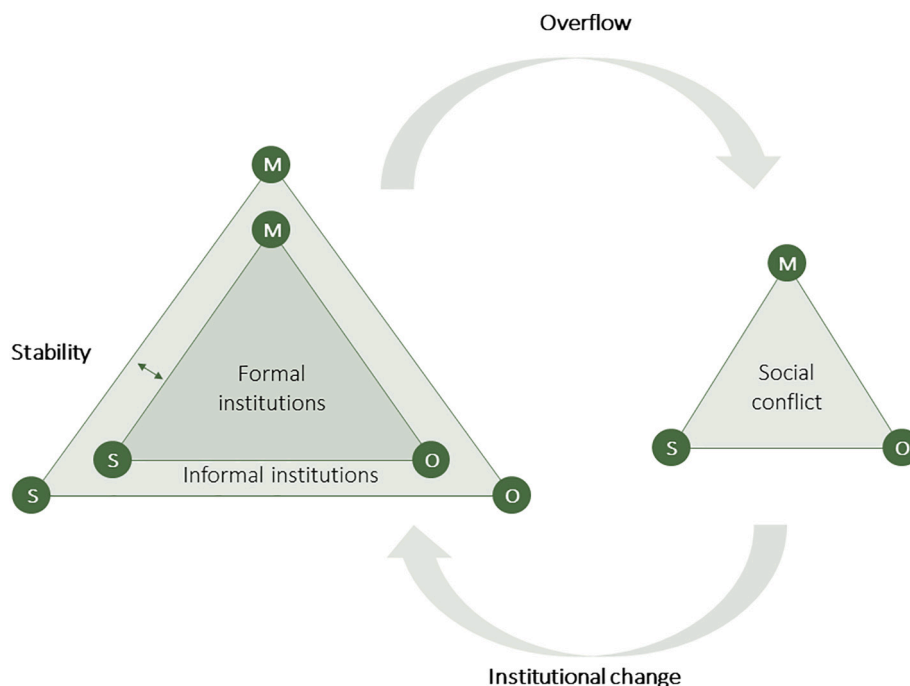


Fig. 1. Our conceptual framework of institutional change, visualised, inspired by Pesch et al. [18], Chilvers et al. [19], and Patterson [20]. S=Subjects, O=Objects, M = Models of Participation.

Institutions are commonly defined as social rules or “humanly devised constraints that shape human interaction” ([22], p. 3). This includes social rules that limit or enable certain types of behaviour. There is a distinction between formal and informal institutions, the former being limited to for example laws, constitutions, and policies, and the latter broadening the scope of institutions to include social norms, taboos, and conventions that shape human behaviour [22,23]. Formal institutions are often embedded in informal institutions (left triangles in Fig. 1). Institutional change entails a shift in both the formal and informal institutions within a society. Early theories on institutional change are embedded in economic theory and examine how and why institutions evolve and shape the possibilities for actors to come into power in the economic system [22]. The idea here is that institutions can constrain or allow certain forms of behaviour and thereby stimulate or impede (economic) growth and opportunities [24]. Institutions are seen as being rigid and providing a structured stability to societal interactions. Institutions can then reinforce themselves through an institutional lock-in in which current institutions strengthen themselves and leave little room for change.

Nonetheless, institutional change is possible when actors react to the set of opportunities that is handed to them by the current institutions and push for change [22]. Actors can (collectively) exert ownership and influence over institutions and thereby continuously introduce, alter, replace, contest, or reject institutions [25,26]. This has led to the coining of the term “institutional work”, meaning the process through which actors purposely or unintentionally influence these institutional structures [27]. Changes in institutions can furthermore be instigated by competition and learning within and among different actors and organisations, exogenous pressures such as conflict or crisis events, changes in the authority balances, and/or changes in underlying norms, values, and beliefs [28]. Especially the idea that large-scale, fast institutional change is often caused by exogenous shocks has been widely supported in environmental governance literature [29,30]. This idea is grounded in ‘punctuated equilibrium’ theory which argues that periods of stability may be interrupted by fast-paced radical change due to an environmental, political, social, or economic crisis situation [29]. Another perspective on institutional change, on the contrary, suggests that incremental changes and developments are most important in shaping the institutional framework. Incremental change implies that rules or the meaning of rules are gradually reinterpreted, developed, or contested to fit the changing norms and values in society [31]. The focus here is on slow, endogenous changes, rather than quick, exogenous influences. It is more difficult to observe the outcomes of such changes as the analysis of incremental institutional change dives more deeply into the change-permitting or self-reinforcing properties of institutions, rather than the nature of external factors [32]. More recent work, however, argues for a combination of exogenous and endogenous rapid shocks and gradual development [33]. In this paper, we adopt this approach, i.e., seeing institutional change as something that slowly evolves but may be pushed by societal shocks (such as social conflict).

2.2. Objects, subjects, and models of participation

To further demarcate which institutions we examine, we add the ecologies of participation (EoP) framework to our framework. This framework helps in narrowing down the focus of our analysis of institutional change to three main categories in which change can occur, whilst accounting for the complexity and interrelatedness of social conflict and institutions. The EoP framework has been introduced by Chilvers et al. as a way to understand the “dynamics of diverse inter-relating collectives and spaces of participation and their interactions with wider systems and political cultures” ([15], p. 200). This reflects a recent academic shift from studying public participation in sustainability policy and projects in isolation on a case-study level, towards understanding participation in a holistic way, being part of a wider socio-technical system [34–37]. This move is necessary, as participation

is becoming increasingly complex, with many stakeholders being involved who have (sometimes shifting) roles in, values of, and contributions to the energy system. In addition, these stakeholders are continuously being influenced by as well as influencing the socio-technical system. The EoP framework reflects the idea that participatory practices occurring within a system, including social conflict as a way of self-invited participation, continuously co-produce and revise the ‘what, who, and how’, or the ‘objects, subjects, and models’ of public participation [17,38]:

- Objects (what): issue(s) actors address, citizens’ reasons for participation within (including opposing) a project.
- Subjects (who): actors who participate and systems in place that determine which actors can participate, including for example concerns over procedural justice and opportunities for a diversity of stakeholders to contribute to decision-making during all phases of a project.
- Models (how): ways in which actors have the ability to participate, including a wide scope of types of participatory methods, ranging from more passive to very active invited and self-organised participation.

These three aspects often overlap in their definitions and effects on participatory processes. Public participation, including social conflict, is not seen as a fixed activity, but rather as a wider, dynamic process in which a multitude of public engagement practices address energy-related issues and thereby “actively produce meanings, knowing, doings, and/or forms of social organisation” ([21], p. 202). Within an EoP, these participatory practices furthermore influence and are influenced by the institutions within which participation occurs. The EoP framework helps us restrict institutional change to the changing institutions regarding the objects, subjects, and models of participation as a result of social conflict on onshore wind energy (left triangle in Fig. 1).

2.3. Social conflict

The EoP framework can be applied as a lens through which to examine social conflict on onshore wind energy, as causes of conflict can be categorised in objects, subjects, and models of participation. Over the past decades, a large body of international academic research has investigated the reasons for social conflict, opposition, and (lack of) public acceptance of renewable energy sources, particularly of wind energy. The underlying reasons or issues leading up to controversies may vary per region and per case [39]. In addition, oftentimes social conflict is the product of various issues that build up over time and across societal issues, such as lack of trust in institutions and democracy, and social injustices [7]. Nonetheless, a couple of significant reasons for conflict can be identified that largely pertain to wind energy conflicts overall and that researchers continue to identify when studying various, diverse cases of onshore wind energy conflicts. Although many of these main reasons extend beyond one of the three categories of the EoP framework, they can roughly be divided in objects, subjects, and models of participation (right triangle in Fig. 1). We have summarised this academic literature and categorised the causes of conflict in Table 1.

Institutional change resulting from conflict and addressing objects, subjects, and models of participation is not a structured process. It is instead dependent on the dynamic interaction of many of such objects, subjects, and models of participation [19,23]. To account for this complexity, we combine the abovementioned theories into our conceptual framework (Fig. 1). We adopt this framework to identify changes in the institutions regarding the objects, subjects, and models of participation within the transition to onshore wind energy in the Netherlands between 2013 and 2022. In addition, we use this framework to investigate how these changes of institutions were caused by the combination of multiple social conflicts regarding onshore wind energy, i.e., to investigate the potential of social conflict to lead to institutional

Table 1
Themes in opposition to wind energy.

Category	Most observed themes in opposition to wind energy	Sources
Objects (the 'what')	Health and annoyance (noise, vibration, flicker, visual hindrance)	[40–43]
	Nature conservation (ecological impacts)	[5,40,44–46]
	Landscape (emotional connection to landscape)	[6,40,44]
	Economy (impact on tourism, reduced property values, exacerbation of inequality, distributive injustice)	[40,44,46–52]
Subjects (the 'who')	Diversity (lack of variety in types of actors who (can) participate in energy projects; missing perspectives in decision-making; lack of acknowledgement of local diversity in national policy)	[4,45]
	Justice (recognitional (values and concerns are not considered), procedural (no equal/fair chance of shaping decision-making process, and distributive (costs and benefits not equally distributed))	[46,53,54]
	Trust (decision-making process perceived to be unfair and untransparent; little faith in policymakers and project developers)	[43]
	Communication (lack of open, clear communication about project; lack of transparency on citizens' influence on the project)	[39,43,46,52]
Models (the 'how')	Consultation ('pseudo-participation'; not embedding citizen input in actual decision-making)	[5,39,43]
	Active participation (participation limited to planning stage of projects; limited intensity, frequency, and duration of participation)	[5,55]

change on a system level.

3. Methodology

To investigate the changes in the objects, subjects, and models of participation on onshore wind energy in the Netherlands and the relationship between these changes and social conflict, we adopted an explorative, qualitative approach consisting of document analysis and semi-structured interviews.

3.1. Focus country

We chose the Netherlands as our focus country because onshore wind conflicts are extremely prevalent here. The Netherlands has for a long time focused on utilising wind energy to meet its renewable energy targets, and has recently set a goal for generating 35 terawatt-hours of onshore renewable energy by 2030, with a large focus on wind energy. All causes of conflict as identified from the literature in Table 1 are present or have been present in the past in the Netherlands. Two causes of conflict play an especially important role in the Netherlands. First, an emotional connection to the landscape has historically been one of the most important objects of conflict: the Netherlands is a small country in which space is scarce. The few areas that are not yet occupied by infrastructure are treasured by local residents. Furthermore, especially issues of justice are important: citizens feel as if they do not have a fair chance of shaping decision-making procedures and end up bearing the burdens of wind turbines without receiving the benefits. Conflict on onshore wind energy in the Netherlands has received a lot of media and political attention, and there are only few cases in which an onshore wind park has been built without any conflict. In addition to conflicts being frequent, they are increasingly becoming more intense, which may be attributed to the resisting citizens becoming more informed on how to effectively block the development of an onshore wind park.

The Netherlands is therefore a suitable focus country. It encompasses all the main causes of conflict as identified in international academic

literature and has faced years of frequent and rather intense social conflict which has had the potential to inform renewed policies and approaches, making it a suitable focus country for analysing institutional change.

3.2. Data collection

We conducted a document analysis of Dutch policy agreements, codes of conduct, procedures, and evaluation reports published between 2013 and 2022 (Table 2). Documents were selected based on initial exploratory desk research and conversations with involved stakeholders into the most prominent policy changes regarding onshore wind energy. A snowballing technique was used in which references within documents helped identify other important (policy) documents and actors. Both prescribing and evaluating documents were included, as the former reveals what norms and values are becoming more important, and the latter assesses whether these norms and recommendations are actually being implemented in practice.

Additionally, we conducted semi-structured interviews of 45–90 min with seventeen experts on the Dutch policy field regarding institutional change, social conflict, onshore wind energy, citizen participation, and energy transition policy (Table 3). The goal of the interviews was twofold: 1) to obtain a comprehensive understanding of both social conflict and institutional change with regards to onshore wind energy; and 2) to hear a variety of perspectives on if and how social conflict contributed to this institutional change, i.e., if and how backflowing occurred. Therefore, the aim was to interview a diverse set of interviewees, covering both research and practice fields and reflecting policymaking, research, consultancy, and interest groups. All interviewees have a national focus but also bring in experience from regional and local cases. Nonetheless, the interview questions steered towards integrating and translating this case-specific experience into a more national context and reflecting on broader changes in Dutch society.

Table 2
Documents.

Year	Document	Explanation
2013	Energy Agreement	National agreement among 47 parties on energy savings, sustainable energy, and additional employment.
2014	NWEA Code of Conduct for Support and Participation in Onshore Wind	Agreement among members of Dutch Wind Energy Association (NWEA) on basic principles of participation and communication on onshore wind projects.
2014–2021	RVO yearly Evaluation Onshore Wind	Annual review of the status and progress of onshore wind projects.
2018	Green Deal Participation of the Environment in Sustainable Energy Projects	Guidelines on improving participation in sustainable energy projects.
2019	Climate Agreement	National agreement on how to achieve climate goals.
2019	Participation Range	Overview of process participation in onshore solar and wind projects.
2020	NWEA Code of Conduct Acceptance and Participation Onshore Wind	Agreement among members of Dutch Wind Energy Association (NWEA) on basic principles of participation and communication on onshore wind projects.
2020–2021	Yearly Evaluation Participation	Annual review of the status and progress of participation in onshore renewable energy projects.
2021	KWINK Group Qualitative Monitor Participation Renewable Onshore Energy	Qualitative evaluation of the status and progress of participation in onshore renewable energy projects.

Table 3
Interviewees.

ID	Organisation	Expertise
I1	Delft University of Technology	Governance of energy transition
I2	Delft University of Technology	Conflict resolution
I3	Ministry of Economic Affairs and Climate Policy (EZK)	Energy policy
I4	Interest Group for Local Residents Wind Turbines & National Platform for Citizen Participation and Government Policy	Citizen participation, conflict
I5	Netherlands Environmental Assessment Agency (PBL)	Living environment policy, citizen behaviour
I6	PBL	Energy policy
I7	Tilburg University	Conflict
I8	National Programme Regional Energy Strategies (NPRES)	Local ownership
I9	KWINK Groep	Energy transition
I10	Learning Platform Energy & Environment	Collaboration, energy network
I11	Energie Samen	Energy cooperations
I12	EZK	Citizen participation
I13	Netherlands Wind Energy Association	Onshore wind, participation
I14	Netherlands Enterprise Agency (RVO)	Onshore energy
I15	RVO	Sustainable energy
I16	NPRES	Wind energy
I17	Utrecht University	Energy transition law

3.3. Data analysis

We thematically coded both the documents and interview transcripts using ATLAS.ti (version 22). Our themes were based on our conceptual framework and our literature review of the causes of conflict as displayed in Table 1. As we were interested in identifying institutional change that reflected the causes of conflict, our codes corresponded to the themes identified in Table 1 (second column), grouped in the three main categories: objects, subjects, and models of participation. In addition to these codes, we added some codes inductively when themes were identified that were not yet reflected in Table 1. The unit of coding consisted of individual sentences, although when this improved clarity of the coded section, two sentences were coded as one.

Data analysis was done by categorising the coded sentences into the framework and manually looking through the coded sentences per category. Based on this, general trends of institutional change regarding objects, subjects, and models of participation were identified. Additionally, the interviewees' answers to the interview questions if and how conflict led to institutional change were identified and compared. Rather than examining individual observations, we looked for patterns and generally recurring themes. We analysed whether and which observed changes corresponded with the causes of conflict, as well as which of these themes were not reflected in changing institutions. We examined both formal institutional change, i.e., changing policies and rules as specified in official documents, as well as informal institutional change, which we found reflected in the terminology used in documents and a general changing mindset described by interviewees.

4. Results

In this section, we elaborate on the general patterns regarding formal and informal institutional change (or a lack thereof) regarding objects, subjects, and models of participation as a consequence of social conflict, as found in the document analysis and interviews. Overall, the interviewees agreed that “the intensity of [Dutch wind energy] conflicts has made room for change. People don't change for no reason. And the conflict is the reason to change” (I4). Many of these changes are found in the terminology used in the documents to describe the energy transition and display a change in norms and values by policymakers and project developers on what wind energy should look like. Interviewees confirmed this informal institutional change by reflecting on a changing

mindset and enforcing social norms, both among project developers and policymakers: “[they] are very much aware of the damage a conflict can have on a community when it really escalates [...] and there is the sincere will and wish not to have that in one's own community” (I7). Additionally, many of these changes have been formalised into binding policies and mandatory procedures to address these objects.

4.1. Objects

For the objects (the ‘what’), meaning the issues actors address to oppose onshore wind energy, the main causes of conflict as identified in the literature (Table 1) were fears of negative economic repercussions to the area, ecological impacts of wind turbines, annoyances and concerns over health impacts of wind turbines regarding their noise, vibration, flicker, and visual hindrance, and an emotional connection to the landscape in which the wind turbines would be placed. For the first two objects, we observed both formal and informal institutional change. For the latter two, institutional change was limited.

Within the main energy policy documents and codes of conduct, there has been a strong shift away from a purely market-driven economic focus on the benefits of wind energy for boosting the Dutch economy, improving the competitiveness of the industry, increasing exports and employment, and generating energy affordability. Instead, the Code of Conduct and wind evaluations from 2015 onwards pressed for a more equal division of revenues through environment and planning funds, local resident schemes, and more local distribution of revenues. According to the interviewees and participation evaluations, these means of redistributing profits have increasingly been adopted by municipalities and project developers, especially since 2021.

The importance of safeguarding nature areas, which was already mentioned in the Energy Agreement (2013), became increasingly important and sparked an increase in ecological analyses, impact studies, and nature-inclusive wind projects. In 2021, the Council of State decided that according to European law, an elaborate environmental impact assessment should take place for wind turbines [56]. This resulted in delays in wind projects, but also instigated a programme by the Dutch state to help local governments and project developers prepare for these assessments.

For the objects health and annoyance and landscape, institutional change was limited. Increased technological innovation has been successful in lessening (perceived) health and annoyance effects due to noise, vibration, flicker and visual hindrance, but institutional change enforcing these innovative tools has been lacking. For landscape concerns, interviewees and evaluation reports did observe formal institutional change towards an increase in area-oriented spatial planning to limit the disturbance of wind turbines to the landscape and to compensate disturbances through additional improvements to the landscape. However, interviewees commented that despite these formal changes, such compensation does not offset the reality of the landscape being affected and citizens being hindered by that. “[T]here will always be some resistance because of that” (I3) and “that will only become more difficult, because we have less and less space left and all the easy locations will be gone soon” (I12). In other words, the institutional change that occurred regarding landscape concerns has not been effective in mitigating this concern.

4.2. Subjects

With regards to the subjects, meaning the actors who participate in wind energy policymaking and projects and the systems in place that determine which actors can participate, the main causes of conflict as identified in the literature (Table 1) included a lack of diversity, justice, and trust in decision-making procedures and energy projects. There have been a few large, visible changes in the specific actors who have a voice in the transition to onshore wind energy and several more gradual changes in the institutions that determine opportunities to participate.

The main formal institutional change has been the decentralisation of energy policy in the Netherlands from national, centralised policy-making to provincial control, to the launching of the Regional Energy Strategies (RES) in 2019. The move to the RES means that thirty regions in the Netherlands are now responsible for investigating how and where onshore renewable energy can best be generated within their region and for recording this in a document (the RES). The RES was launched after provinces and municipalities realised that national energy planning was not working well and resulted in conflicts. They pressured for a change from a centralised to a more decentralised approach which “comes directly from the experiences they’ve had before that” (I13). The RES leaves more room for local, inclusive approaches to wind energy, but decision-making might become more difficult as the RES regions are not a formal layer of government.

Generally, the projects and (national) policymaking on onshore wind energy have largely opened up to include a wider and more diverse variety of stakeholders. The Energy Agreement already provided a first step in this as more than 40 organisations from different fields contributed to creating and signing the agreement. Nonetheless, citizen groups were still missing from this picture. Citizens were included more in national policymaking from 2013 onwards, when the Interest Group for Local Residents Wind Turbines (NLVOW) was founded. Interviewees mentioned that although the aim for inclusion is formally present in official documents, in practice two groups are often not included: citizens who disagree and citizens who are difficult to reach. Furthermore, many of the targets on inclusion in for example the Codes of Conduct are nonspecific and very much open to interpretation, making it difficult to measure whether and to what extent inclusion is happening.

Furthermore, there has been an increase in collaborative approaches among governments, project developers, citizens, and nature organisations, for example in the joint development of agreements, participation plans, wind projects, and the founding of learning platforms to “facilitate that people have conversations, expand their network, and share knowledge, to help in approaching things differently and looking at things differently” (I10). Additionally, there has been a bundling of strengths to press for institutional change, mostly by citizens in the founding of the NLVOW (2013) and of cooperative energy initiatives in *Energie Samen* (2018). Their bundled voices have helped in developing informal institutional change regarding inclusion of citizens into formal institutional change, namely through the formal inclusion of citizens in policymaking and the inclusion of a 50 % local ownership target in the national Climate Agreement.

Justice has also become an important concept in onshore wind energy projects and policymaking, although not all aspects of justice are addressed equally in formal and informal institutions. The focus in the past ten years has been on distributive justice and the wish to keep burdens and benefits in the same place, i.e., to have local citizens profit financially from wind energy generation, because they also carry the burdens of a wind turbine. This was well represented in formal institutions through a change from mostly focusing on financial compensation to alternative ways of achieving distributive justice, such as in the form of co-ownership, local resident schemes and local environment and planning funds. From 2017 onwards in the yearly evaluations of wind projects, justice was increasingly defined as meeting social pre-conditions and having wind projects contribute to the local community on a larger scale, for example through adding social value, strengthening communities, and introducing integrated solutions. Explicit formal targets for this are lacking, but it does reflect informal institutional change.

With regards to trust and transparency, changes can be observed as well. An earlier wind evaluation (2014) observed a hesitance from project developers and governments to provide detailed information on bottlenecks and uncertainties of projects, mainly because they were afraid that projects would then be cancelled as a result of negative framing in the media. However, this led to reduced trust in projects when these bottlenecks eventually came to light and a reduced trust in science and policymaking in general: “if people have a concern about

something but they can’t prove it, that doesn’t necessarily take away that concern. Then there must be a lot of trust in the explanation, and I think you see diminished trust in science there” (I12). In addition, interviewees mentioned that until around 2015, there were many different projects and policy plans without clear guidelines or structured direction on how to execute these projects. From 2015 onwards, more clarity and transparency on project development was provided, both by governments and by project developers, as a result of the Codes of Conduct in which open communication and transparency is required from all stakeholders involved.

4.3. Models of participation

For models of participation, the main causes of conflict as identified in the literature (Table 1) were related to different levels of participation – communication, consultation, and active participation – and issues of limited impact related to these levels. Institutional change was observed mostly as a shift from communication as a primary model of participation towards active participation becoming the norm. Most of these changes were reflected in formal documents, yet they lack binding commitment and specific procedures or evaluation tools.

For communication as a model of participation, the main causes of conflict were a lack of open, clear communication about the project and citizens’ potential influence on the project. To combat these issues, there has been a main formal change in the timing of communication. Early and open communication about wind projects has become the required norm: “the code of conduct also says that you should inform the surrounding area as soon as you intend to get started with a wind farm” (I13). Whereas this used to be the task of project developers, governments are now also demanded to take responsibility in communicating this well, especially when it concerns communication around spatial procedures.

Another change has occurred in what should be communicated. Whereas earlier, the focus was on mostly communicating what would happen and where, this has shifted to include information on what leeway still exists within those plans and what the relevance and necessity of the onshore wind projects are and why there is a wider societal value or need to implement these projects. These changes in the norms are mostly reflected in the codes of conduct, but the yearly evaluations reflect that there is still a need for clearer communication procedures and one line of communication between project developers and governmental bodies at all levels of government (national, provincial, regional, local).

In addition to changes in communication, a shift has occurred to include citizens more actively through consultation models. The interviewees mentioned that between 2013 and 2022, citizens’ wishes, knowledge, and concerns were actively and increasingly sought out and taken into consideration by project developers and municipalities through sounding boards, dialogue sessions, and kitchen table conversations at different stages of a wind energy project. This is increasingly being formally embedded in national law and policymaking, such as in the development of the Environment and Planning Act (expected in 2024) in which such forms of participation become a mandatory part of energy projects.

Moreover, the need for active participation of citizens has become the norm, as can be seen from the Codes of Conduct, Green Deal, Climate Agreement, RES, and national, provincial, and municipal environment and planning visions, and the upcoming Environment and Planning Act. These documents have explicit chapters devoted to active participation methods, including process participation, co-ownership, financial shares, environment and planning funds, local resident schemes, or a combination of these. These documents stress the need to commence active participation from the start to inform policymaking, rather than only being adopted near the realisation phase of a project. Nonetheless, the yearly evaluations mostly focus on financial participation, mainly local ownership, whilst process participation is often not measured.

Initial models of financial participation were limited to financial compensation for projects or financial revenues for individual citizens or farmers who would make their land accessible for wind projects. This exacerbated perceived inequalities in local communities when some citizens would profit whilst others would only be disadvantaged by a wind project and resulted in increased tension and social conflict. In the past few years, financial participation has moved towards achieving social revenue, i.e., benefits for local communities through shares, bonds, and other forms of co-ownership, local environment and planning funds, and local resident schemes (such as discounts on energy for citizens living nearby a wind project). The largest formal institutional change has been the goal within the Climate Agreement that for large-scale generation of renewable electricity on land, the aim is to achieve 50 % ownership of the local environment. This is an aim, so not a hard requirement, but interviewees mentioned that it is being taken seriously: “We are now seeing the first provinces that include the pursuit of local ownership in their environment and planning vision and policies. Then you can still argue that there is no legal basis, so we cannot legally impose or enforce that goal, but the obligation to make an effort is getting stronger in this way” (I8). Moreover, such an aim results in an entire “secondary support market” (I11) in which energy cooperatives receive more attention and support from e.g., consultancies who now understand that this aim of 50 % of the market is a large share and that energy cooperatives should therefore be included more.

5. Discussion

Overall, the results have shown the institutional changes resulting from conflict that have occurred for the Dutch transition to onshore wind energy between 2013 and 2022. We focused our analysis on the objects, subjects, and models of participation, which helped us delineate where change did and did not occur. Our results suggest that previous conflicts and the arguments and values that arose during these conflicts have been used as a source of information by project developers and policymakers to change policies and approaches.

Despite the abovementioned observed institutional changes regarding objects, subjects, and models of participation, interviewees reflected that there has not been enough institutional change to address all the concerns as arisen during social conflict. Formal institutional change was limited, especially concerning the subjects and models of participation. For these categories, conflict was often based on more abstract topics such as feelings of injustice, emotional concerns or fears, and (political) distrust and discontent. For such issues, it is difficult to determine whether change and learning from conflict has occurred: e.g., how to measure whether a process is more just? Who determines what is just? For these issues, informal institutional change was found in abundance: non-binding social norms, values, and conventions regarding what participation ought to look like and how policymakers and project developers ought to behave were detected in many of the documents and confirmed by the interviewees. However, these norms were oftentimes not accompanied with formal rules on what this meant in practice. Guidelines were kept ambiguous, resulting in different interpretations and levels of commitment among different policymakers and project developers. This lack of concrete expression also complicated the monitoring and evaluation of agreed-upon codes of conduct. In other words, conflict resulted in informal institutional change, but the extent to which these norms and values were applied in practice was dubious.

Some interviewees mentioned that this lack of formal change is a result of the limited operational capacity of stakeholders, such as civil servants, to really change their practices. Others mentioned that the growing bitterness of conflict makes it more difficult for policymakers and project developers to alter their behaviour, as the critiques they have to deal with are extreme. Their initial positive ambitions to change processes then often quickly fade. Overcoming these issues requires first of all more operational capacity of civil servants to address these issues,

and second more support for policymakers and project developers to learn how to deal with conflict in such a way that it can yield positive, productive results. Additionally, some interviewees argued that conflict does lead to institutional change, but that it is an iterative process in which the right decisions cannot always be made from the start, which calls for the importance of a long-term approach to renewable energy projects in which lessons from earlier projects are taken into account in new projects. Furthermore, a lack of observed change might be a result of the complexity of the process of institutional change in which change is driven by both exogenous and endogenous ruptures and developments [33]. This makes it difficult to determine the relationship between conflict and change, as sometimes there is already a gradual, growing societal tendency towards a certain change. Conflicts might then give a boost to these developments, but there is not always a direct observable relationship between conflict and institutional change.

Through this research, we built a framework combining institutional change literature with the EoP framework and theories of overflow and backflow. Institutional change leads to new overflow when changed or improved institutions do not fit with the ever-changing societal reality they are embedded in. This iterative process is at the core of the EoP framework: continuous coproduction and mutual influence of participatory practices and institutions are key to describing a system as complex as the transition to onshore wind energy [19]. Nonetheless, we found that the EoP framework, despite its value in being able to explain broader dynamics within a complex system, also faces a problem of being too nonspecific to empirically apply. As an analytical tool, the EoP framework then becomes problematic. To overcome this issue, we combined institutional change theory with the EoP framework. By doing this, we managed to operationalise institutional change in such a way that we were able to systematically evaluate the relationship between conflict and change. It has resulted in a conceptual framework that enables us to comprehend distinct changes and developments while still allowing for a systemic analysis that does not reduce the complexity of the processes of social conflict and institutional change. We see an opportunity for future research to apply such systemic analyses with measurable indicators to other complex socio-technical energy challenges.

6. Conclusion

In this paper we aimed to answer two research questions and thereby have a conceptual and an empirical contribution. First, there has been a call for more systemic analyses of the impact of conflict on socio-technical systems and the policies underlying these systems [9,16,19]. We aimed to fill this gap in the literature through the building of a framework with which to evaluate institutional change as a result of multiple social conflicts. With this, we answered the research question: how can institutional change as a result of social conflict be assessed? Our framework has been successful in explaining broad dynamics in a complex socio-technical system, while identifying specific institutional changes resulting from social conflict. Our approach and conceptual framework could further be applied to other socio-technical transitions to better understand how institutional change develops and potentially results from social conflict. Our second research question was: how did institutional change resulting from conflict occur for the Dutch transition to onshore wind energy between 2013 and 2022? We empirically applied our framework to the case of institutional change resulting from conflict in the Dutch transition to onshore wind energy. We found a wide variety of institutional changes regarding objects, subjects, and models of participation that evolved between 2013 and 2022 as a result of social conflict on onshore wind energy. Most of these concern informal institutional changes of norms and values and assumptions of what participation ought to look like. More specific, binding guidelines and rules, i.e., formal institutional changes, are still lagging behind. These results confirm the idea that social conflict can have positive value and lead to institutional change, but also address the need for a more open attitude

towards social conflict to utilise it to its full potential.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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