



Conflict management instruments for the energy transition

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ABSTRACT

The pressure to act on the energy transition and contribute to clean and affordable energy as one of the Sustainable Development Goals continues to rise. However, the energy transition is a socio-technical challenge that harbors considerable potential for social conflict. To address this issue, this article presents research that has developed a set of options for dealing with existing and possible future conflicts in the energy transition in Germany focussing on the electricity sector. The use of these conflict management instruments, including economic measures, adjustments to different laws, and measures to strengthen participation, can make the transition in this sector more resilient. To increase the chances that this desirable societal impact is achieved, the instruments were developed in a mutual science-practice learning process. The article describes this process which was inspired by transdisciplinary approaches and based on feedback workshops with a variety of practice actors. It concludes by emphasizing that there is a good chance of multiplier effects in relation to a published impulse paper on the key results of this process and promising conflict management instruments. The importance of energy and climate protection agencies participating in the workshops is also emphasized.

SPECIFICATIONS TABLE

Subject area	3301: Social Sciences (miscellaneous)
Category/categories of societal impact Sustainable Development Goals (SDGs) the research contributes to	Societal, Legal GOAL 7: Affordable and Clean Energy GOAL 13: Climate Action GOAL 10: Reduced Inequality
Related project reports	
	<i>SyKonaS - Akteurskonflikten in der Energiewende gegensteuern: Impulse für die Instrumentenentwicklung, 2024, Verbundvorhaben SyKonaS, Koordination: Zentrum für interdisziplinäre Risiko- und Innovationsforschung der Universität Stuttgart (ZIRIUS), doi: 10.18419/opus-14238; SyKonaS - Projektbericht Nr. 4, Entwicklung und Anpassung von Instrumenten zur Konfliktbearbeitung im Rahmen der Energiewende, 2024, Verbundvorhaben SyKonaS, doi.org/10.18419/opus-14085; SyKonaS - Projektbericht Nr. 3, Abschätzung gesellschaftlicher Konflikte in Energieszenarien, 2023, Verbundvorhaben SyKonaS, doi.org/10.18419/opus-13958</i>
Stage of research	The SyKonaS-Project is completed (end month: April 2024)

Societal impact: a more resilient design of energy transition paths

The energy transition is a socio-technical challenge that harbors considerable potential for social conflict. This is also the case in Germany, which has set itself the goal of becoming climate-neutral by 2045. A review of the German energy transition referring to the year 2023 points to a number of current developments that could jeopardize support for climate protection among the German population and harbor potential for conflict in relation to the energy transition as a whole [1]. These developments include the fact that climate protection has become less of a priority for the German population and that some people feel financially threatened by measures to achieve climate protection targets. In the electricity sector, the potential for conflict is also evident in the ongoing protests in parts of Germany by those affected by infrastructure projects such as wind turbines and power lines. At the same time, the pressure to act on the energy transition and contribute to affordable and clean energy as one of the Sustainable Development Goals continues to rise: climate change is progressing at an alarming rate [2], and Russia's war of aggression against Ukraine has shown how risky dependence on fossil fuel imports is. As a result, parts of the climate

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movement have increasingly taken measures of civil disobedience to demand further climate protection measures.

The research presented in this paper addresses energy transition conflicts as a political and legal field of action and has identified a range of potential instruments for dealing with existing and potential future social conflict in the electricity sector. The aim of the paper is to outline the approach the project has chosen to include practice actors and their expertise in regard to energy transition conflicts (see [Info box 1](#)) into the research process and thus increase the practical relevance and societal impact of the project results. The project (short title: SyKonaS, duration 2021–2024) was funded by the German Federal Ministry of Economic Affairs and Climate Action (BMWK).

While social conflicts are an important element of democratic societies, precautions must be taken to ensure that the achievement of the politically agreed energy transition goals are not seriously jeopardized [5]. The SyKonaS project aimed to develop a methodology to anticipate and address social conflicts relating to the energy transition before they manifest themselves more broadly and apply the methodology to the transformation of the electricity sector as an example. Using a scenario-based approach, core social conflicts should be identified and conflict management instruments newly or further developed to contribute to a more resilient design of energy transition paths in the electricity sector [6]. A central research question was which conflicts are particularly in need of action and development in terms of instruments to produce this positive societal impact. When addressing this question, the knowledge and perspectives of practice actors from politics, administration, business, organized civil society and the energy transition service sector should be taken into account. The following section describes the methodological approach and the procedure for this task.

The multi-actor feedback workshop method

SyKonaS was interdisciplinary (collaboration of social sciences, law, economics and engineering) and took also a transdisciplinary approach. It was committed to this perspective: Complex real-world problems require an adequate problem description (here, energy transition-related social conflicts) and solutions (here, conflict management instruments) that incorporate practical knowledge, views and preferences of relevant practice actors. Practice actors can significantly increase the social effectiveness of scientific results in such research areas. This has been shown in the literature on transdisciplinary research [7]. One of the project tasks was therefore specifically to organize an exchange that would lead to a mutual learning process between science and practice and thus increase the practical relevance of the research results and chances of practical implementation of conflict management instruments found to be particularly relevant (see [Fig. 1](#)).

Methodologically, this took place via dialog-based and moderated feedback workshops. The participants in the four workshops were made up of pre-defined groupings of practice actors, whose interest, knowledge and experience in relation to energy transition conflicts could be identified in advance. The feedback workshops were held at two points in the course of the project, at which preliminary results were available for these central research questions (see [Fig. 1](#)): What are existing or potential future core social conflicts in the electricity sector, where is there a particular need for newly or further developed conflict management instruments? Which conflict instrument options are considered to be particularly relevant and effective and should therefore be prioritized for dissemination to the relevant stakeholder communities and examined in greater depth in further studies, for example with regard to legal feasibility and design? [Table 1](#) provides an overview of design aspects of the feedback workshops.

Results and implications: prioritization and specification of instrument options and multiplier effects

Due to the large number of conflict issues identified from the

literature and energy scenarios, SyKonaS had to prioritize when selecting overarching conflict areas to be focused on in the development of conflict management instruments. The workshops have expanded the information basis for prioritizing conflict areas, for the specific design of individual instruments and for selecting the instruments which were explained in more detail in an impulse paper. This is explained here by way of example for the conflict area “fairness and cost/burden sharing”. One reason why this conflict field was selected by the project as a core area of conflict was that the first three workshops each concluded that the associated issues deserve much more attention than is currently the case in German energy transition policy and have great potential as a driver of conflict. A series of instrument options for this area of conflict were then put up for discussion at the fourth workshop. The focus was on questions of a fair or more even distribution of locations and thus the location-related burdens of renewable energy plants (see [Table 2](#)).

The first instrument option (“*Capping the amount...*”) was discussed intensively in comparison with the other options. Initially there was a controversial exchange, particularly between actors from agriculture and organized civil society, who often take different positions on the energy transition issue. In the course of the discussion, participants developed a specific variant of this conflict management instrument, which finally met with broad approval. This variant combines capping with payments to affected municipalities. A limit is set for the amount of lease payments and, if this limit is exceeded, a fixed percentage of the lease amount is to be paid to the local authorities by being passed on by the project developer to the local authorities concerned. This can have positive financial effects for the local authorities. At the same time, it prevents lease levels from rising very sharply and, as a result, the distribution of the costs or burdens of the energy transition being perceived as even less fair. This variant is among the instrument options that are explained in more detail in the SyKonaS impulse paper “Akteurskonflikten in der Energiewende gegensteuern: Impulse für die Instrumentenentwicklung”¹ [8]. This project publication has practice actors as the main target group.² The presented instruments include economic measures such as financial incentives/compensations, changes to energy sector regulations, adjustments to lease law, nature conservation law and planning law, as well as measures to strengthen financial and procedural participation in the energy transition.

Practice actors could not discuss the full range of instrument options newly or further developed by the project in the fourth workshop. This is mainly due to the time constraints of dialog-based workshops, and it is a limitation of the methodology that should be mentioned here. For example, some participants in the last workshop complained that instruments on “social cost and burden sharing of energy transition measures”, the third conflict topic identified by SyKonaS in the conflict area of “Fairness and cost/burden distribution”, were not put up for discussion. The project team refrained from doing so because instruments in this area have already been dealt with in detail in the literature and discussed widely in the political arena. On the other hand, the “participation” area of conflict, although widely discussed in academic literature and politics, was one key subject of the workshop. Several participants in the previous workshops had called for this conflict area to be made a priority. One reason given for this was that there was a conflict of objectives between “carefully implemented participation” and “accelerated energy transition” and that an accelerated energy transition, as called for by the German government, should not lead to democratic principles and requirements being neglected. In the view of these practice actors, conflict management instruments in the field of participation should try to address this conflict of objectives.

¹ In English translation: “Managing Stakeholder Conflicts in the Energy Transition: Impulses for the Development of Instruments”.

² The SyKonaS impulse paper was produced in an accessible and visually appealing format and sent to all workshop participants and other relevant actors.

Info box 1
SyKonaS-terminology.

"Energy transition conflicts [social conflicts] are disputes between at least two stakeholders about political, economic, social, technical, ecological and/or global issues or perspectives on the energy transition in general or its implementation at local level. In these conflicts, contradictory goals, interests and/or perceptions of the actors on a topic face each other and at least one of the actors feels directly or indirectly disadvantaged if the other actor succeeds in asserting her/his goals/interests. At the same time, there is pressure to act now or in the future to respond to these contradictions in some way." [3] (emphasis in bold added; we translated the quote from German into English)

Practice actors are "actors to whom the results of the research are directed [...] and who, in relation to the topic under investigation, have practical expertise that complements the research expertise of the researchers". [4] (we translated the quote from German into English)

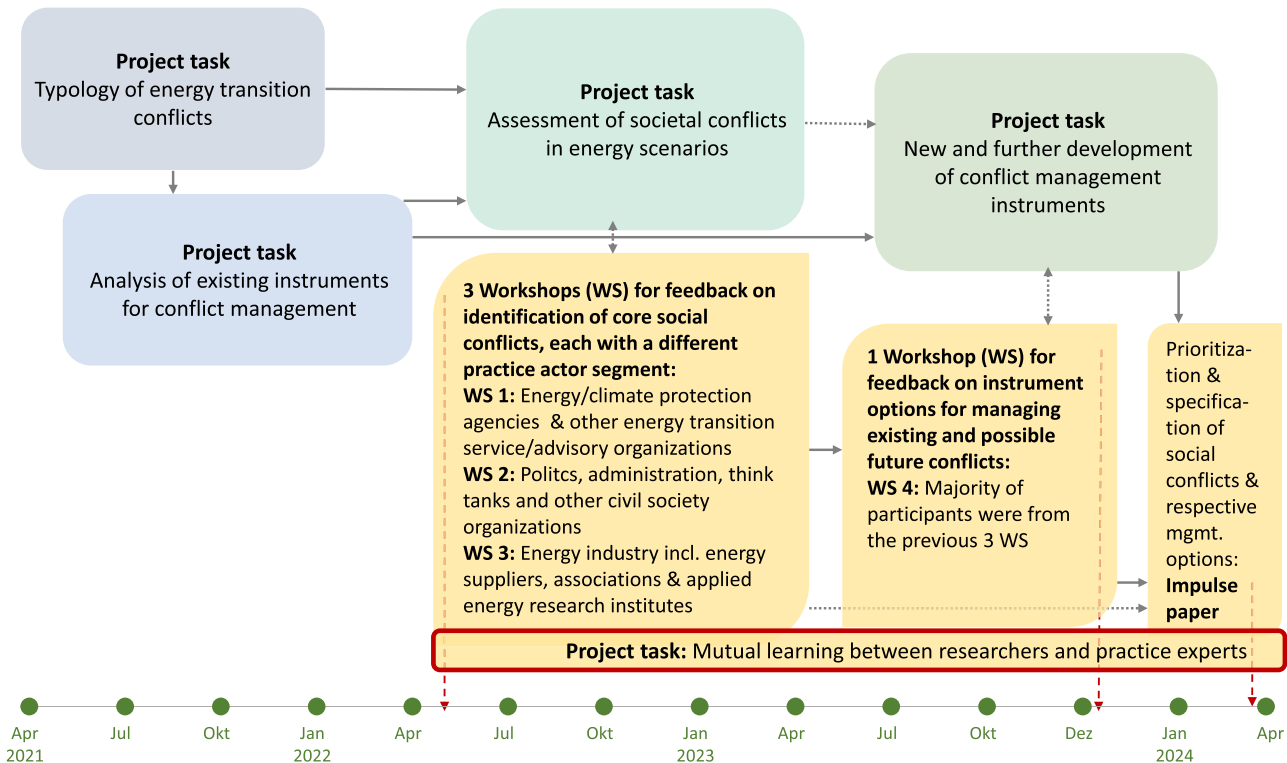


Fig. 1. Workshop-based mutual learning process for the development of conflict management instruments.

It is also a limitation that the response to the impulse paper could not be examined in the project's lifetime. It is a well-known challenge of research aimed at societal impact that such impact often only becomes visible after a longer period of time - whereby the multitude of contextual factors also make it difficult to attribute certain effects to specific research projects. However, there is reason to assume that workshop participants will act as multipliers for the impulse paper. It is true that only some of the contents of this publication could be discussed in more detail with them. However, their preferences for setting priorities can be found in the publication, in the selection of areas of conflict and in the different degree of detail in which instruments are described. The participants will therefore find themselves reflected in the content of the publication.

Another favorable prerequisite for multiplier effects is the high participation of energy and climate protection agencies in the feedback workshops. These intermediary organizations are playing an increasingly important role as "transmission belts for the success of the energy transition" [9]. In addition to agencies at national level, it is primarily regional and local agencies that implement the energy and climate protection policies of the federal and state governments in local projects by providing information, advice, campaigns and regional networks.

These organizations often have in-depth knowledge of conflicts that arise, for example, in connection with infrastructure projects for the expansion of renewable energies at regional and local level, and of the potential of possible measures to resolve or deal with such conflicts. SyKonaS was not focused on the analysis of individual cases, but rather on the identification of areas of conflict and the associated conflict topics. It was therefore advantageous to attach particular importance to recruiting practice actors/multipliers who have contacts and experience with actors at the local level and at the same time can abstract from the specifics of individual cases.

In summary, SyKonaS has reached a broad audience through the systematic involvement of various practice actors. Through the feedback workshops, these actors were able to acquire further contextual and practical knowledge regarding conflict potential and instruments in a mutual science-practice learning process. They can use this knowledge to have a forward-looking impact in their respective fields of activity and strengthen efforts to further develop promising instrument options and pave the way for an energy transition that is supported by society as a whole.

Table 1
Design aspects of the multi-actor feedback workshops.

Workshops (WS)	Workshops 1–3	Workshop 4
Title	Understanding and anticipating social conflicts in the energy transition.	Addressing social conflicts in the energy transition: Instruments for conflict minimization and management.
Purpose	Obtain feedback and advice on the basis of the experience and expertise of a diversity of practice actors regarding the plausibility of what the project has identified as core (existing or possible future) social conflicts. Main analytical basis: assessment of conflicts in selected energy transition scenarios using a literature-based conflict typology and set of conflict indicators.	Obtain feedback and advice on the basis of the experience and expertise of a diversity of practice actors regarding the plausibility of what the project has identified as instrument options for minimization and management of core social conflicts and regarding the question of what priorities should be set for the options. Main analytical basis: literature-based identification of gaps and challenges that existing instruments do not yet sufficiently address, linking the results with the analysis of the energy transition scenarios and integrating the results of the three previous WS.
Recruitment	Mapping of relevant practice actors; recruitment criteria: diversity of practice fields (politics, administration, service-organizations, economy, organized civil society) and practice levels (federal and state level); personal invitation letters.	Participants were recruited from the three previous WS at which the fourth WS had already been announced. The last WS thus brought together a wide variety of practice actors and enabled a degree of continuity in workshop participation that supported the interaction and learning process in the feedback workshops. It also corresponded to the explicit wish of the participants of the first three WS to also discuss conflict solutions and not to stop at identifying core conflicts; personal (re-) invitation letters.
Conduct	Event dates: May 19, 24 and 31, 2022; three WS with equal structure, each with a different practice actor segment to enable intensive discussions for all actor groups (see Fig. 1); no. of participants from practice: 14–19 per WS; online, in response to COVID–19; project presentation on core conflicts followed by small group-feedback sessions using pre-defined guiding questions, reporting back and plenary discussion; participants received presentation slides and additional information on the project's methodical approach to conflict analysis in advance.	Event date: Dec 5, 2023; the majority of participants in this WS were from the three previous WS, with some new participants recruited; no. of participants from practice: 23; online, based on the positive experience with this format of the previous WS; project presentation on instrument options followed by small group-feedback sessions using pre-defined guiding questions, reporting back and plenary discussion; participants received presentation slides in advance.
Outcomes	WS-report with an overview of the feedback, reflections and suggestions from the group and plenary discussions sent to all participants after validation feedback loop; use of the WS-results for prioritization of social conflicts and development of respective conflict management options.	Project-internal WS-report that was used together with the reports from the previous WS to further prioritize and develop conflict management options and present these instrument options in an impulse paper that was published in March 2024 and sent to all WS-participants and further multipliers.

Table 2
Fairness-related instrument options dealt with at the fourth workshop.

Conflict area "Fairness and cost/burden distribution"	
Conflict topic	Instrument options
Landowners: Unequal treatment and profit distribution	<ul style="list-style-type: none"> – Capping the amount of lease payments to landowners of renewable energy installations – Further development of area pooling models – Obligatory lease payments to land neighbours – Preferential financial participation of neighbours
Regions: Cost and burden sharing of energy transition measures	<ul style="list-style-type: none"> – Transferring land certificate trading to renewable energy expansion – Linking funding structures for rural areas to the expansion of renewable energies – Promotion and support of regional development concepts

Ethics

"The Authors have read and follow the ethical requirements for publication in Societal Impacts and confirm that the current work does not involve human subjects, animal experiments, or any data collected from social media platforms."

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CRedit authorship contribution statement

Marion Dreyer: Writing – review & editing, Writing – original draft.
Christian D. León: Writing – review & editing, Writing – original draft.
Andreas Püttner: Writing – review & editing, Writing – original draft.

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.

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