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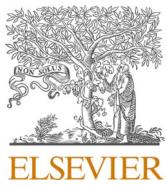
Review

# Out of place, scale and time? Navigating injustices across mission arenas of the German Energiewende

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A B S T R A C T

The uptake of transformative mission-oriented innovation policies has coincided with explicit calls to better understand their justice implications. Our qualitative meta-analysis addresses this 'justice deficit' by identifying, synthesizing, and reinterpreting empirical findings of 26 justice-related case studies that collectively draw from 1569 data points, and which pertain to the mission context of the German Energiewende. We review observations linked to four justice tenets (e.g., distributive justice) across four policy arenas of the mission (e.g., programmatic arena). The results reveal some of the multi-scalar, multi-spatial, and multi-temporal ways through which injustices are conduced and addressed. We argue that injustices should not be treated as apolitical side effects of 'neutral' missions but rather viewed as symptomatic of contested policymaking processes.

## 1. Introduction

Recent years have witnessed a global proliferation of transformative mission-oriented innovation policies (MOIP) to address urgent challenges like climate change, pollution, and pandemics. These cross-sectoral innovation policies act as policy mixes or packages that contain concrete and time-bound objectives to invoke major transformations of our societies [1–3]. Missions are policy approaches for 'direction-giving' [4] that promise to unite diverse stakeholders [5] by converging our understandings of problem definitions and solution framings [6]. A well-known example is the EU's NetZeroCities mission, which aims to create 100 climate-neutral cities by 2030. Not only do these policies aim to deliver *more* innovations, but they are especially aimed at promoting more *desirable* innovations [7].

Nonetheless, missions are oftentimes initiated, framed and legitimized as ambitious, urgent, and risk-taking approaches to transformative innovation that 'inherently' create winners and losers. The contexts in which these missions are embedded are characterised by deeply-rooted politics and power struggles [5,8], and the aspired transformations that they conduce can correspond with profound changes in the social order as labour shifts [9], power shifts [10], and value change unfold [11]. Amidst the US energy transition, for example,

the shut-down of coal plants in Appalachia and Utah corresponded with a loss of (intergenerational) identity, employment, and belonging, while inhabitants suffered from increased and unequal energy costs [12–14]. The transformative changes that missions aim to induce therefore fundamentally raise the stakes for many stakeholders, especially for those that are already vulnerable and marginalized. Against this background, scholars have warned that MOIPs can engender major justice implications that policymakers will need to reflect and act upon [8]. Perhaps more fundamentally, such mission policies naturally raise questions over whether their ends justify their means.

However, what the justice implications of MOIPs precisely entail remains unclear, which is symptomatic of a broader knowledge gap on missions' normative aspects [15,16]. In line with recent contributions to the mission debate [8,17,18], we view the associated injustices not as apolitical outcomes of 'neutral' policy interventions, but rather as the result of deliberate choices that foreground contested processes in policy arenas. While it may be naïve to expect that injustices can be avoided all together, current contributions to the academic debate on MOIP commonly overlook injustices, treat them as given, or depict them as inevitable side effects [16]. Some scholars go as far to suggest that this 'justice deficit' even holds for the broader domain of transformative innovation policy [19].

Such a dearth of socio-ethical considerations becomes problematic once it impedes a policymaker's moral reflection necessary for transformative missions to become fairer, more inclusive, and more equitable. Addressing this gap does not only have intrinsic normative value, but recent evidence goes further by suggesting that the perceived fairness of transformative policies strongly corresponds with their

legitimacy and acceptability, something missions require to succeed [20].

Accordingly, this paper responds to recent calls for a better understanding of mission justice [8,16,21]. Building on the literature of 'just transitions' and justice more broadly (e.g., [22–26]), we take *distributive, procedural, recognitional,* and *restorative justice* – four prominent justice
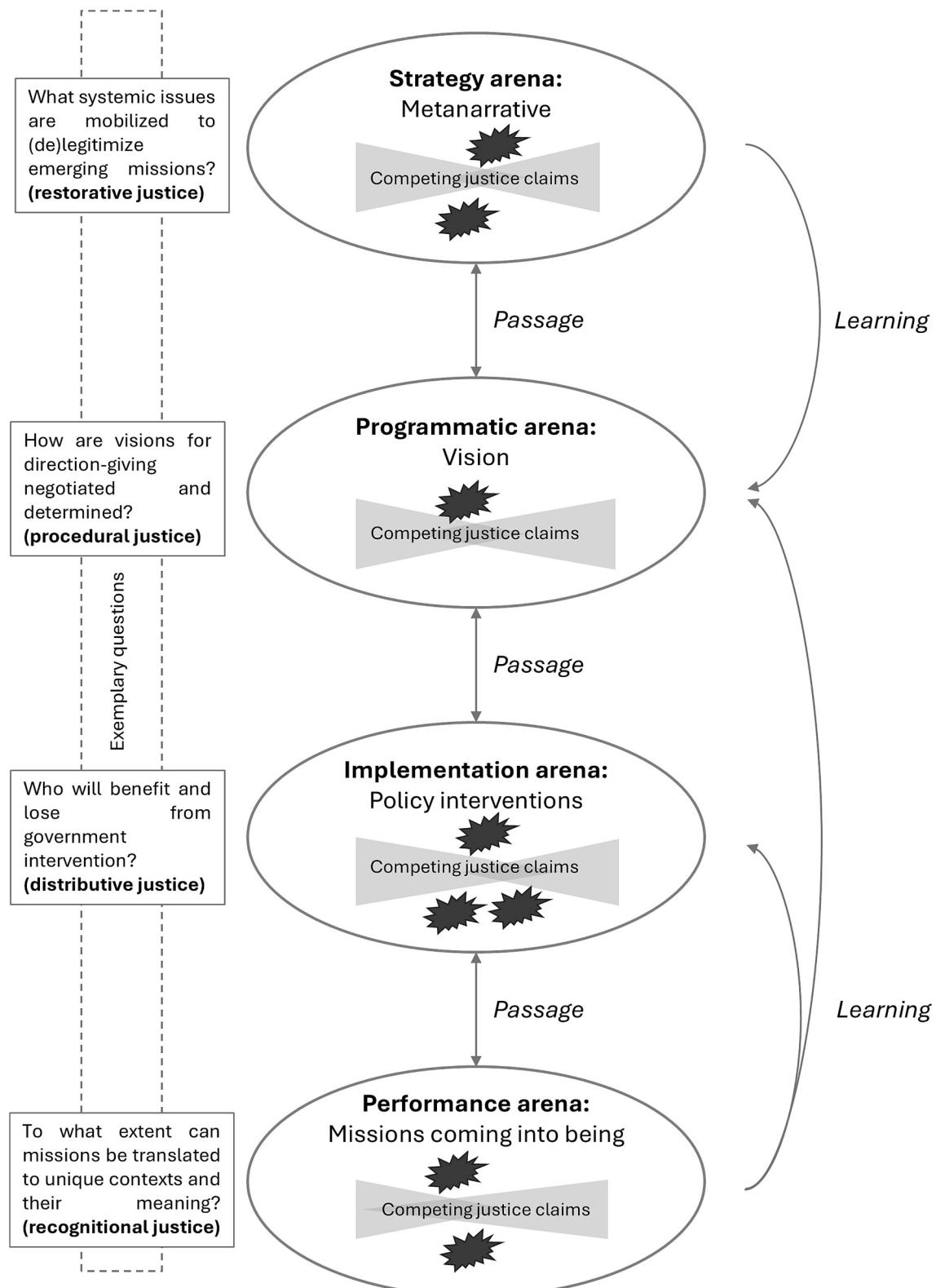


**Fig. 1.** Exemplary diagnostic questions capturing competing justice claims across mission arenas (adapted from Janssen et al. [27]).

tenets – as our entry point for the conceptualization of mission justice. We hypothesize that the associated injustices emerge as a result of scalar activities across various interrelated policy arenas of missions [27,28]. In this light, we ask *what kind of injustices emerge in mission arenas?*; *How do injustices in one arena make passage to another arena?*; And *what are some of the ways in which these injustices can be prevented or addressed?* To answer these questions, we turn to the German Energiewende as our empirical context. We conduct a qualitative meta-analysis of case studies on the Energiewende to aggregate empirical insights related to justice and reinterpret these through a MOIP lens. It is not our intention to establish an exhaustive inventory of justice claims, nor do we contend whether the Energiewende has handled justice tenets well or poorly. This would not only reduce complex normative phenomena to simple black-and-white questions, but it would also go against the ethical pluralism that forms the basis of our research, and which prevents us from making such definitive judgments. Instead, this study aims to reveal some of the scalar injustices that emerge across mission arenas to provide a more explicit and grounded understanding of the justice implications that MOIPs may engender. It furthermore aims to identify some of the ways through which MOIPs can prevent or address these injustices. We hope that such insights will help policymakers critically reflect on the design, implementation and evaluation of MOIPs.

## 2. Conceptualizing mission justice

The concept of justice broadly refers to whether both human and non-human stakeholders are treated as fair, equitable, and respectful [25]. With the exception of a few studies [8,21,29], the debate on MOIP rarely explicitly engages with the concepts of justice and just transitions [16,19]. For our conceptualisation of mission justice, we can draw from the adjacent debate on just transitions, which bears particular relevance because it is likewise concerned with the notion of justice amidst sociotechnical change.

Although there is no universal definition of just transitions, the concept commonly refers to the theories, governance strategies, and perceptions of fairness in the transformations of systems [26]. The concept of just transitions encourages us to scrutinize how and why certain stakeholders benefit and suffer from transformations [23]. Answering such concerns in the wicked context of missions is difficult because stakeholders perceive, understand, and work with justice considerations in different ways [21]. As pointed out by several scholars, stakeholders rarely oppose the idea of justice itself, but opposition usually emerges from different interpretations of what justice means to them [30,31]. Mission justice should therefore be understood as an inherently plural concept that gives rise to conflicting justice claims of which each can be equally valid [32]. The (competing) perceptions of injustices are important for policymakers because they explain conflicts, trade-offs, and controversies that affect the legitimacy and ethical acceptability of missions.

Against this contested and plural notion of justice, mission scholars point at the inherent politics that explain the decisions that are conducive of injustices in mission contexts [8,17,18]. These politics take place in so-called mission arenas [33,34] (Fig. 1), which represent the political spaces in which invited and uninvited stakeholders negotiate, establish, and interpret the formulation, implementation, and evaluation of MOIP [35,36]. A distinction between mission arenas is particularly relevant for the justice debate, because they denote who is (not) involved and responsible for certain policymaking activities in mission contexts. Janssen et al. [27] and Klerkx et al. [28] differentiate between four of such mission arenas where stakeholder views can converge and diverge, namely the *strategy arena*, *programmatic arena*, *implementation arena*, and *performance arena*:

- In the strategy arena, actors (e.g., politicians) legitimize why and how government intervention is needed. Policy metanarratives are constructed that generically articulate stories to mobilize action and

inspire stakeholders. They identify and prioritize problems that require systemic intervention.
- The programmatic arena is concerned with the operationalization of the metanarrative into concrete visions and agendas, and the mobilization of necessary resources to do so. This arena usually involves sectoral ministries and interest groups that negotiate on the necessary course of action.
- The translation and enactment of the programmatic vision happen in the implementation arena where concrete policy instruments are designed and used across various levels of governance.
- Lastly, the performance arena refers to the space in which firms, citizens and other stakeholders are subjected to the policies and where such policies thus materialize.

The four mission arenas are hierarchical in the sense that each arena corresponds with a certain *scale* that is partly fixed (place-based and geographical) and partly flexible (relational and constructed) [37–39]. The relationship between scalar arenas depends on how governmental structures distribute political responsibilities across a given policy environment. Here, the strategy arena commonly represents the 'highest' scale (e.g., national level) whereas performance arenas at the 'lower' scale can be embedded in various regions and localities. This hierarchy of arenas generally implies that higher-level arenas are assigned political and moral responsibility for being sensitive and responsive to the concerns expressed in lower-level arenas. Janssen et al. [27] and Klerkx et al. [28] argue that mission arenas interact in at least two ways.

On the one hand, 'passage' can occur when meanings (e.g., perceptions of injustices) are transferred across arenas, influencing the degree to which normativity is shared among stakeholders. Passage can occur through carriers like policy documents or media outlets that convey justice-related information. As a result, the extent to which procedures in one arena are perceived as fair, inclusive and transparent can, in theory, determine whether competing justice claims emerge in different arenas. On the other hand, 'reflexive learning' takes place when stakeholders within and between arenas exchange views and learn from one another (e.g., through consultation or opposition). Intermediary organizations are typically well positioned to stimulate policy learning regarding how to deal with power inequalities and stakeholder conflict [28]. Hence, learning activities in one arena may help prevent, address, or restore injustices through decisions in other arenas. While differentiating between mission arenas provides analytical clarity, it commonly remains implicit how scalar injustices emerge and make passage across the four mission arenas.

Against this conceptual background, we understand *mission justice* as a guiding, scalar principle to ensure that missions are formulated, implemented, and evaluated across arenas in ways that promote fair, inclusive, and equitable transformations. Striving for mission justice can then be understood as 'the right thing to do' and may therefore be valuable in itself. Normative and evaluated approaches can use mission justice as a theoretical lens to investigate how missions are and should be governed [40].

In advancing our conceptualizing of mission justice, we build upon the four core tenets of just transitions (i.e., distributive, procedural, recognitional, and restorative justice) and link these to the four mission arenas (Fig. 1, Section 2.1.–2.4). Our conceptualization thus roughly describes the 'what', 'how', 'who', and 'for whom' of mission justice across various political spaces. Although justice tenets interact and overlap, each pertain to distinct concerns [41,42]. In what follows, we discuss and animate these four tenets of mission justice by partly drawing from the energy justice literature because our meta-analysis focuses on the Energiewende case.

### 2.1. Distributive justice

Distributive justice is concerned with how desirable and undesirable consequences are shared among stakeholders [25]. These consequences

can be tangible (e.g., profits and vaccines), but may also refer to intangible aspects (e.g., burdens and responsibilities). Economists commonly touch upon distributive justice implicitly when they discuss MOIP's potential to create public value and inclusive growth [43–46]. Such discussions are important for the governance of missions "in ways that are meaningful for the many, and not just profitable for the few" [47, p. 21]. In addition, distributive justice usually involves considerations of the risks and opportunities, costs and benefits, and winners and losers that such policies engender as also implicit in the work of [5]. For example, energy transitions have taken away jobs from coal plant workers in the performance arena who are forced to take up replacement jobs with sometimes lower wages [48] and longer commutes [12,49]. Determining fair distributions of risks and rewards remains difficult and partly depends on who is taking and determining such matters. Henrekson et al. [50], for example, points out that although "it is unproblematic for private actors to bear high risk, it is difficult to justify, in a democratic setting, that politicians and civil servants take risks with taxpayers' money in the same way" (p. 315). In addition, while mission policies commonly rest on utilitarian logics, such 'best-for-most' frames may conflict with other fairness-based approaches that, amongst others, can account for matters of vulnerability and capability of individual stakeholders. Distributive justice does not dictate that (in)tangible consequences should be shared evenly, because grand challenges "affect places in different ways and to different extents" [51, p. 56]. The fair allocation of outcomes therefore depends on context-specific considerations. What is more, the decades-long character of many MOIPs hints that intergenerational considerations have relevance for distributive justice as decisions in the present will greatly influence future generations [52,53].

### 2.2. Procedural justice

Procedural justice considers whether decision-making processes are inclusive, fair, and transparent [25,42]. The energy justice literature has captured various procedural injustices that emerged in the performance arena from insufficiently including communities who were requested to host wind turbines in their area (e.g., [54–57]). The democratization of missions can greatly promote procedural justice because collective decision-making has inherent normative value [8]. Such democratic processes are "essential for genuinely addressing the underlying challenge and harnessing the capacity and resources from various groups" [5, p. 442]. However, democratic processes do not necessarily ensure fair participation if enacted poorly [58–60] and "can even be paradoxical, reinforcing the problems that they intended to solve but [which are] now sanctioned or legitimized by the participatory process" [61, p. 15]. Pressing questions for procedurally just missions entail who is included and excluded in the programmatic arena during the formulation, implementation, and evaluation of missions [21] and "who determines the direction of transformative change?" [62, p. 1]. In practice, this would require early and equitable stakeholder engagement [40]. But as Janssen et al. [5] rightfully ask, "how much say do they [stakeholders] have in shaping these processes?" and "which interests are explicitly or implicitly prioritised, and how are they represented [?]" (p. 440). Although governments were conventionally 'picking winner' to safeguard national interests, policymakers increasingly lean towards 'picking the willing' for mission-oriented innovation [2]. In some cases, this could make sense if governments aim to accelerate transitions, but excluding any opposition (e.g., activists) could also raise procedural injustices. It is therefore unclear to what extent there is space for disagreement and conflict in mission-oriented contexts [5,63]. This becomes particularly problematic once governments are not well positioned to understand societal needs [64]. Especially in the programmatic and implementation arena where policymakers are relatively distant from everyday practices. Therefore, policymakers "may not always 'know best' or 'act best'" [15, p. 4] and are said to commonly prefer techno-centric approaches that neglect the complexity of problems and further reinforce socio-economic inequalities [65,66].

### 2.3. Recognitional justice

Recognitional justice refers to whether stakeholders are appropriately considered, represented, and respected [67,68]. Policymakers are urged to recognize heterogeneous stakeholder values and worldviews [42] because MOIP "runs the risk of providing a one-size-fits-all approach" [6, p. 475] that leans on "taken-for-granted problem definitions … while marginalizing opposing voices or discarding complex trade-offs" (ibid.). The wicked context in which missions operate means that we cannot assume consensus on problem definitions and solution framings, and as such, recognitional justice demands that policymakers reflexively broaden their views on problems and solutions (e.g., [6,63,69]). Politicians in the strategy arena may nevertheless render missions as monolithic visions to discursively conceal divergent views that oppose hegemony, and which could crumble the legitimacy of government intervention. If done non-reflexively, missions can legitimize controversial technologies as crucial solutions for grand challenges, and by doing so, undermine (latent) societal concerns [66]. For example, the implementation of wind turbines is sometimes met with protestors in the performance arena whom are oftentimes stereotyped as NIMBYs (i.e., not-in-my-backyard) and whom are sidelined as misinformed, conservative, emotional, and self-interested 'empty vessels'; a view that fails to recognize the genuine concerns local stakeholders may have [40,70]. Implicit proponents of recognitional justice argue that it is precisely contestation that underlines the imperative of stakeholder deliberation [71] because disagreement is rarely resolved through *more* scientific facts [72]. In recognizing stakeholders, policymakers will need to discard stereotypical and narrow assumptions [62,73] and may need to apply a more context-led approach to missions [74] through processes of that have been labelled as 'anchoring' [75], 'regioning' [36], and 'localisation' [76]. These processes commonly involve consultations with civil and industrial stakeholders to determine how national ambitions can be translated and implemented in ways that do justice to local contexts.

### 2.4. Restorative justice

In contrast to distributive, procedural, and recognitional justice, restorative justice is a relatively new tenet of justice, which calls for a greater attention to the past. It underscores one's responsibility to rectify historical wrongdoings, for example, through forms of decolonisation [42,77]. Restoration can be pursued through material means (e.g., financial compensation) but nearly always involves relational efforts to rebuild trust [24]. For instance, the extraction of natural gas in the Dutch Groningen region induced earthquakes that damaged local housing, and which sparked controversies in the implementation arena over the ways, timing, and adequacy of (non-)monetary forms of compensation [31]. Such restorative and backward-looking forms of (in) justices are oftentimes neglected in the mission debate, which seemingly contrasts the overarching mission logic "to change part of a system when changes in ecological, political, social or economic conditions make the existing system untenable" [78, p. 2]. Therefore, Kok & Klerkx [8] call for a better understanding of restorative mission justice to rectify the historical "damages done to ecosystems … and the associated colonial (market and institutional) structures of global trade and oppression that have come with the technologies and practices developed" (p.4). However, breaking free from such structures will likely elicit opposition from incumbents who thrive under the continuity of growth-oriented paradigms [69]. Simultaneously, politicians in the strategy arena may reassign responsibilities for restoration to others as ways of circumventing matters of political accountability.

## 3. Method

To understand how distributive, procedural, recognitional and restorative injustices emerge across the four mission arenas, this paper selects the German Energiewende as its empirical environment. By means of a qualitative meta-analysis, we identify, synthesize, and reinterpret findings from case studies that pertain to this mission context, but which have not yet been considered through the lens of MOIP. Section 3.1. first explains why we selected the Energiewende for this study, after which Section 3.2. discusses the methodological considerations for our meta-analysis.

### 3.1. Germany's Energiewende

The Energiewende is Germany's cross-sectoral mission for its energy transition. Its political and legal roots stretch back to the 20th century, but it was formally launched in 2010 by the Federal Ministry for Economic Affairs and Energy. The Energiewende is commonly viewed as a typical transformative mission because of its clear objectives to transform socio-technical systems in response to societal challenges [2,79–81]. Some scholar have even described it as "one of the world's most ambitious and comprehensive national energy transition initiatives" to exist [82, p. 1]. The Energiewende is an integrative mission that comprises prominent policy documents (e.g., Renewable Energy Act and the *Energiekonzept*) and policy instruments (e.g., feed-in tariffs). Although the mission was formulated in the strategy arena at a national level, its implementation strongly relies on the efforts that are enacted in the implementation arenas of the German federal states (Länder).

The mission strategy aims to reduce greenhouse gas emissions to 88 % (relative to 1990) by 2040, to be carbon-neutral by 2045, and to increase the total share of renewable energy to 80 % by 2030. In order to accomplish this, four main objectives have been introduced in the programmatic arena, namely: addressing climate change (1), phasing-out nuclear energy (2), promoting energy security and autonomy (3), and increasing the competitiveness and growth of the energy industry (4). Over the course of a decade, the mission has booked a number of successes and faced various challenges. While the stop on nuclear energy in 2023 is oftentimes praised as a major achievement, the Energiewende received criticism for a fixation on wind energy while overlooking the transport and heating sectors [82]. In contrast to the mission goals, recent years have even sparked renewed interest in coal energy to promote energy security in light of Russia's invasion of Ukraine [83]. Despite historical upheaval, Germans now generally concur with the overarching mission that was formulated and envisioned in the strategy and programmatic arena [84], but specific policy instruments and the ways these are implemented remain highly disputed [85].

The Energiewende is a particularly relevant mission-context to study injustices across mission arenas, because of the salient controversies that it has triggered around issues of energy security, energy affordability, employment, and the speed of such disruptive socio-technical changes [86]. As a result, a wide range of studies point at the conflicts and protests that are symptomatic of public discontent (e.g., [85,87–89]). In this study, we conduct a qualitative meta-analysis to select and utilize the various case studies from the rich literature on the Energiewende to capture injustices that possibly loom in mission arenas.

### 3.2. Qualitative meta-analysis

The Energiewende is one of the most extensively studied mission-oriented transitions to date and has culminated into a large and rich corpus of case studies that are conducive for an empirically grounded review. To identify, synthesize, and better understand injustices across arenas of the Energiewende, we therefore conducted a *qualitative meta-analysis* (QMA) [90,91]. QMA is a type of systematic literature review that was developed in the late 1980s to increase the comprehensiveness of qualitative case studies [92,93]. It aggregates insights that have a direct or indirect relevance to a phenomenon of interest. Since QMA only considers qualitative aspects of existing studies, it is particularly well-suited for analysing justice-related phenomena, which are inherently (inter-)subjective, perceptive, contested and plural in nature. As such, QMA is well-designed to aggregate qualitative insights that explicate and empirically ground our understanding of mission justice.

We followed the four stages of QMA: study selection, appraisal, data preparation, and analysis [91,94]. For the first step, this study adopted the PRISMA framework [95] to systematically identify relevant case studies pertaining to the Energiewende (Fig. 2). We first collected any English and German academic articles and reviews from Scopus that contained the term 'Energiewende' in combination with 'justice' or any other related word. The following search query was used:

TITLE-ABS-KEY (Energiewende AND ("justice" OR "solidarity" OR "freedom" OR "respect" OR "trust" OR "democracy" OR "exclusion" OR "power" OR "participation" OR "engagement" OR "inclusion" OR "risk" OR "harm" OR "benefit" OR "ethic\*" OR "responsib\*" OR "equality" OR "equity" OR "fair" OR "transparan\*")) AND (LIMIT-TO (LANGUAGE,"English") OR LIMIT-TO (LANGUAGE,"German")) AND (LIMIT-TO (DOCTYPE,"ar") OR LIMIT-TO (DOCTYPE,"re"))

In the second step, the identified studies are appraised to determine their relevancy for inclusion. This number of cases can be as few as two [96] but usually entail around 10 cases because this allows for enough depth to accurately portray qualitative experiences [94,97]. We included case studies if they are empirical (1), qualitative (2), peer-reviewed (3), focused on the German Energiewende (4), and presented sufficient information (5). Case studies are also required to focus on at least one of the four justice tenets as described in Section 2 (6). Similar to Hoon [98], we used this second step to familiarize ourselves with each study's research topic, theoretical focus and research method (as reported in Section 4.1.). This inventory additionally helped us reflect on the validity of cases. Our appraisal resulted in the selection of 26 case studies (Appendix I) that collectively draw from at least 1569 data points (e.g., interviews).

The third step entails the data preparation, which refers to the initial coding of data that is deemed relevant. This study focused on findings that relate to the four justice tenets as outlined in Section 2 (i.e., distributive, procedural, recognitional, and restorative justice). Structural coding on the sentence and paragraph level was employed to identify these justice-related findings. We followed [16] by coding any statements that broadly described observations and claims related to the (un)fair distribution of beneficial and harmful impacts (distributive justice); (un)fair and (un)transparent decision-making processes (procedural justice); the (in)adequate representation and recognition of identities, values and worldviews (recognitional justice); and the (un)responsiveness to historical wrongdoing (restorative justice). Methodological experts have emphasized the importance of retaining the context of primary studies to promote the validity of QMA [90,91,99,100] and avoid insights from being "distorted into clarity" [101, p. 1]. In response, we have used descriptive coding to determine to what German state, region, or municipality justice insights pertain.

The last and fourth step concerns the formal data analysis. We conducted a deductive thematic analysis that falls into a descriptive-interpretive approach. Open coding was utilized to *describe* observations of injustices within case studies (see earlier coding rules). In QMA, such codes are sometimes referred to as 'meaning units' [90,91]. We *interpreted* each code by linking these findings to each mission arenas (i. e., strategy, programmatic, implementation, and performance arena). Following Section 2, the codes were linked to the strategy arena when they were associated with the space in which stakeholders (de)legitimize the mission and governmental intervention in the first place (e.g., through parliamentary notions, speeches, nation-wide protests). Codes related to the programmatic arena pertained to spaces in which visions for transformation were articulated and negotiated (e.g., national road maps, ministerial reports, large infrastructural plans). The
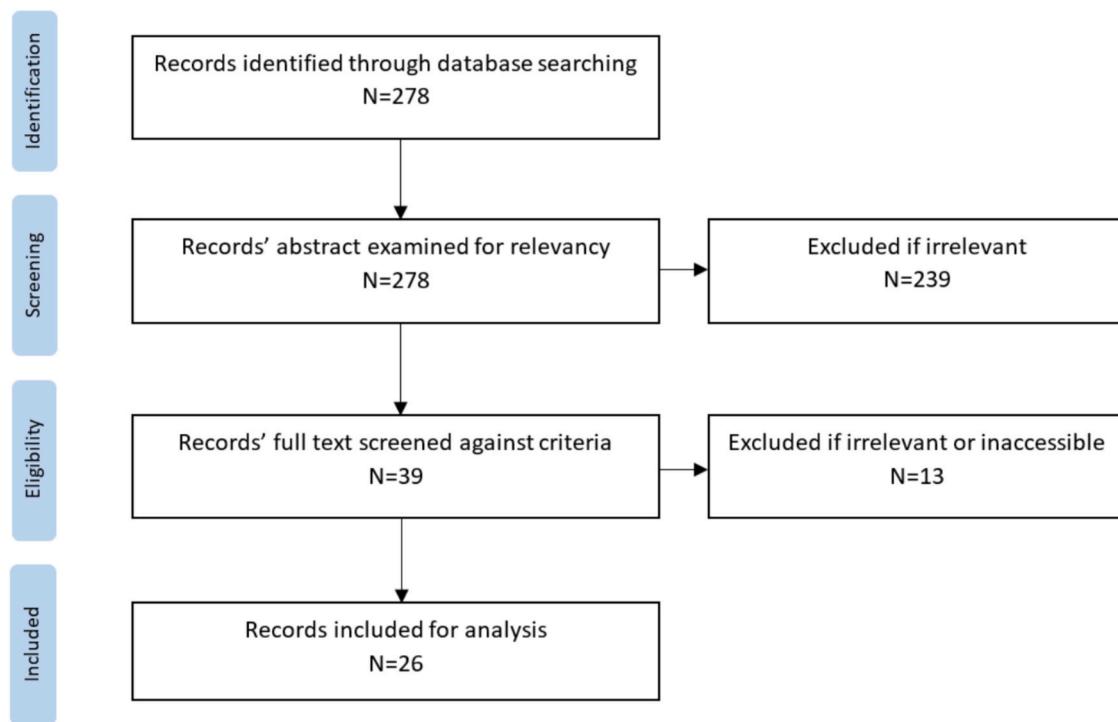
**Fig. 2.** Record identification, screening, eligibility, and inclusion. Based on Moher et al. [95].

implementation arena is relevant when justice-related codes apply to the space in which concrete policy interventions across policy (sub-)domains were formulated and set out to enact the mission strategy and vision (e.g., mission teams, policy instruments, opposition to novel institutions). Lastly, codes were linked to the performance arena if they related to the space were policy intervention and infrastructural developments materialize (e.g., innovation projects, citizen deliberations, local realities). As such, each observation was linked to *at least* one justice tenet and one mission arena. For instance, interviewee 4, 10, and 14 of Rehner & McCauley's case study [102] make distributive justice claims over the effect of feed-in tariffs on low-income households. In this case, interview quotations were linked to both distributive justice and the implementation arena where the enactment of policy interventions take place. As Kerker et al. [103] point out: "distinguishing between (political) scales [or arenas] referred to in complaints about injustices is not always straight-forward, particularly for issues that impact both individuals (micro) and society at large (meso)" (p.6). Our thematic analysis was therefore conducted by two coders, who discussed any coding discrepancies until inter-coder agreement was reached but we simultaneously recognize that codes may apply to multiple tenets and arenas. QMA sometimes involves an auditor who has not been involved in the coding process, but who checks the results for their validity *ex post* [91]. This role was taken up by the third author.

## 4. Results

In line with guidelines for qualitative meta-analyses, Section 4.1 first describes our selection of case studies after which Section 4.2 reviews justice observations across the four mission arenas of the Energiewende.

### 4.1. Brief description of case studies

Our sample covers 26 articles published between 2015 and 2024 (Appendix I). Implicit and explicit justice tenets are examined through qualitative (multi-)case studies that explore themes such as social acceptance, opposition, and participatory governance. Amongst others, they pertain to topics like nuclear phase-outs, grid expansions, and wind energy projects. The data collection of our sample draws from at least 1569 data points (e.g., interviews, workshops, news articles), with most studies triangulating data (although transparency in reporting sample sizes and methodological approaches varied significantly). Articles primarily report insights in relation to distributive justice (55 codes) and procedural justice (51 codes) while forms of recognitional justice (5 codes) and restorative justice (5 codes) remain largely absent (Table 1). Most justice observations come to the front in the performance arena (46 codes), programmatic arena (31 codes), and implementation arena (25 codes), with relatively little focus on the strategy arena of the Energiewende (14 codes).

### 4.2. Injustice across mission arenas of the Energiewende

In what follows, this section synthesizes justice observations pertaining to each mission arena. An overview of the major justice claims is presented in Tables 2–5.

#### 4.2.1. Strategy arena: Missions as emerging policy metanarrative

The strategic arena is the space in which the Energiewende was initiated and legitimized [27]. This never happened in a policy vacuum but was linked to historical developments that can be traced back to the 1960s [104]. Continuous and committed protests throughout the 1970s, political lobbying, and two nuclear catastrophes gave rise to fierce socio-

**Table 1**
Thematic focus expressed in the number of articles (frequency of codes) linked to justice tenets and mission arenas.

| | Distributive justice | Procedural justice | Recognitional justice | Restorative justice |
|---|---|---|---|---|
| Strategy arena | 3 (5) | 3 (8) | 1 (1) | 0 (0) |
| Programmatic arena | 7 (22) | 5 (7) | 0 (0) | 1 (2) |
| Implementation arena | 6 (9) | 11 (13) | 2 (2) | 1 (1) |
| Performance arena | 10 (19) | 10 (23) | 2 (2) | 1 (2) |

**Table 2**
Scalar justice observations in the strategy arena.

|  | Distributive justice | Procedural justice | Recognitional justice | Restorative justice |
|---|---|---|---|---|
| Strategy arena | Environmental hazards and (intergenerational) societal risks over nuclear meltdowns, waste, and smog legitimized targets for the phase-out of nuclear and fossil-based energy. | Nation-wide debates over the role and influence of new entrants on strategic decisions.<br><br>Social movements and activists protested in favour of climate action. | Major protests across the nation opposed nuclear energy as public concerns were insufficiently recognized by politicians. | – |

political debates on the threats of climate change and the distributive injustices associated with nuclear power, which ultimately sparked and legitimized the emergence of the Energiewende [104–106]. Rehner & McCauley [102] find that these debates were especially dominated by the issue of nuclear waste (expert interviewee 1, 2 & 6) and that "continued engagement in an activity which produces waste for which there is no solution to manage the inherent dangers will subsequently be bequeathed to potentially hundreds of future generations, is morally reprehensible" (ibid., policy expert interviewee 10). Intergenerational forms of distributive justice claims were made as various interviewees argued that "[the distribution of] burdens between present and future generations is unjust because living generations are depriving future generations of their livelihoods though excessive consumption and lifestyles" [103, p. 9]. Paul [106] points out that the nation-wide, civic opposition against nuclear power is not only about energy perse, but that it is also a symptom of a broader democracy deficit in relation to meaningful participation in decision-making. Rehner & McCauley [102] additionally observe that the mission's metanarrative contained difficult trade-offs between various forms of distributive injustice. For instance, several expert interviewees pointed out that while a nuclear-phase out may pose radiation and melt-down risks, alternative technologies such as coal plants and wind turbines impose national health risks like smog and noise, respectively. In return, experts interviewees in favour of the Energiewende strongly emphasized that a transition would lead to job creation, innovation, and greater industrial competitiveness [107]. Over time, the mission's metanarrative increasingly emphasized the involvement of energy cooperatives, citizens' energy groups, firms and other new entrants which commonly led to fierce debates about the role that such new actors should play in the transition [105]. The German Federal Government aimed for social acceptance through deliberative fora and public campaigns to ensure support for the transition and its

required research and innovation [108]. The discourses in the strategic arena had performative power over how stakeholders took in positions throughout the transition. Gailing [105], for instance, denotes the consistent emphasis on 'prosumers' to highlight that citizens would be empowered as both producers and consumers of energy.

### 4.2.2. Programmatic arena: Missions as a vision

In the programmatic arena, stakeholders are concerned with the establishment of policy programmes, agendas, and visions to meet the goals set in the strategic arena [27]. To reach the targets of the Energiewende, Germany envisioned an expansion of biomass power, reduction of feed-in tariffs for wind turbines, shut down of all nuclear plants, and an increase in wind energy capacities [104]. Such ideas are commonly weighed against matters of energy security (1), economic feasibility (2), environmental compatibility (3), and increasingly more against societal acceptance (4), but difficult trade-offs are often inevitable [102].

Leipprand & Flachsland [107] find that proponents (e.g., green NGOs and various think tanks) and antagonists (e.g., trade unions) of the Energiewende use similar but contradicting framings to support or oppose trade-offs for the vision. Yet, nearly all of them expect future energy production to be more decentralized by moving away from a few central energy systems [102,109,110]. Some political parties like the Christian Democratic Union advocated for an energy and cost-efficient decentralization through renewable energy companies, whereas more progressive parties like Die Linke prioritized the uptake of smaller, local and community-led energy projects [109]. While both sides expressed disagreement, the general belief emerged that the 'big four' companies (RWE, Vattenfall, E.ON, and EnBW) should be challenged by multiple smaller sources such as municipality, cooperatives, and small businesses [111]. This would shift power and ownership to a larger and more diverse set of stakeholders, potentially promoting procedural justice amidst the Energiewende.

The national vision was later complemented by additional targets, legislation, and research and innovation programmes of federal states [112]. In some cases, this was a response to the uneven distribution of financial burdens resulting from the national energy policy (ibid.). The German Ethics Commission on a Safe Energy Supply and other influential actors underlined that the Energiewende should be a collective, coordinated, and efficient effort of states to limit the expansion of energy grids and to keep consumer costs low (ibid.). In such processes, however, energy incumbents have attempted to undermine the participation of less influential stakeholders which arguably corresponded with procedural injustices. One interviewee of the Rosa Luxemburg Stiftung, for example, claims that "there are increasing attempts of big energy corporations to take over the Energiewende, to steer it into another direction and to slow it down at the same time. And that is reflected in increasing investments into offshore wind energy" [106].

An analysis of 280 citizen initiatives pertaining to the Energiewende shows that while 49 initiatives question *whether* the transition is needed,

**Table 3**
Scalar justice observations in the programmatic arena.

|  | Distributive justice | Procedural justice | Recognitional justice | Restorative justice |
|---|---|---|---|---|
| Programmatic arena | Justice claims assert that the envisioned SüdLink will unfairly distribute burdens across certain regions.<br><br>Decentralized energy production is expected to affect a higher number of (non-)humans than just a few centralized power plants would.<br><br>The planned closure of lignite plants and mines is claimed to result in massive job losses. | 100+ citizen initiatives have been established to better express concerns over wind farms in certain regions.<br><br>Justice claims assert that big energy companies have unfair opportunities in shaping the vision for the Energiewende. | – | Potential economic declines associated with visions for the Energiewende insufficiently recognize the historical setbacks that some regions have already suffered (e.g., Lusatia). |

139 challenge *how* this transition is envisioned [113]. In particular the vision for one of the largest grid expansions, known as the SüdLink, was deemed necessary by the government to transport energy from the windy North to the high-use South but sparked strong objections in the implementation and performance arena where such visions needed to be enacted [113–115]. Civic movements (particularly in Hesse) criticized the vision's emphasis on wind energy for disturbing the natural environment and threatening human health, calling it "ecological and economic senselessness" [113] (citizen initiative 13). Wind critics confronted the rather deterministic focus on decentralized wind energy in the programmatic arena, and advocated for the consideration of other options than wind energy or the limited expansion of bioenergy plants and electricity grids [105]. While the government viewed the SüdLink and its overhead transmission lines as imperative for the Energiewende, Galvin [114] reports that Southern Bavaria has untapped potential for wind energy and dam power storage that has not seriously been considered.

The programmatic arena was also characterised by fierce debates over unemployment and Germany's industrial competitiveness [116]. Status quo defenders argue that the intention to close lignite plants and the associated mines would result in distributive injustices such as massive job losses, structural disruptions, and hence give rise to existential fears as regional livelihoods will be threatened and overburdened. This was especially deemed problematic for regions that already experience historical setbacks (e.g., Lusatia). With this vision, EnBW argues, "the economic outlook for conventional generation facilities in Germany has worsened considerably" [117]. Leipprand & Flaschland [107] quote the President of the Mining, Chemical and Energy Workers' Union who stated: "we now see that one wants to reach the climate targets … solely at our expense". Status quo defenders claimed that the Energiewende represented a threat to energy security and that reliable coals plants are needed [107]. Compensating a nuclear-phase out with fossil-fuelled power meant that a reduction of greenhouse gas emissions as a form of environmental justice could not be achieved [102].

Ultimately, the Russia-Ukraine war has urged Germany to reassess its vision for the Energiewende as to allocate greater priority to energy security and sovereignty, meaning that Russian gas imports needed to be reduced while alternatives like renewables, domestic lignite, and US liquefied natural gas received (renewed) interests [118]. As the Spokesman of the far right-wing AfD party claimed: "Yes, it is important to talk about nature conservation, too. But the well-being of people must have priority here. I repeat myself: we are talking about basic services here, and a state must guarantee those" [118, p. 6]. Germany's reliance on Russia therefore sparked novel debates over the importance of sustainability in relation to distributive justice.

### 4.2.3. Implementation arena: Mission-oriented policy interventions

In the implementation arena, visions are enacted through policy interventions and other actions [27]. The federal states are largely responsible for the Energiewende's implementation, with the aim of translating national strategies to regional conditions and also seize benefits like job opportunities [107,112]. While the metanarrative and vision are now widely supported, the financial and practical implementation at the regional and local level has met greater opposition [118].

Conflict in this arena was largely sparked by the envisioned SüdLink overhead transmission lines that needed to be implemented at the regional level [119]. A public consultation in 2014 about this infrastructure received over 26,000 responses of which many respondents expressed the need for a more distributively just and decentralized system that would make the corridor no longer necessary [120]. Opposition in Lower Franconia (largely situated in Bavaria and Baden-Württemberg) was particularly intense and has been referred to as "trouble at the end of the line". Regional actors feared unfair competition of the SüdLink with local renewable energy producers, particularly after already having experienced job losses from nuclear shutdowns [114, p. 114]. The implementation of the SüdLink was experienced as a procedurally unjust and as a "centralized decision made by the Federal government under pressure from vested interests, with no attempt to gain insights from locals or involve them in the initial decision making" (ibid., p. 120) that led to an 'us versus them' sentiment [115]. While one citizen argued that these lines "make much more sense than an underground power line because of the lower costs. The Bavarians have insisted on underground lines. And the others are paying for it now, so all the citizens of Germany are paying for it." [103] (interviewee IA5).

Conflict in the implementation arenas often emerged because it was in many cases unclear for citizens whether municipalities and federal states act on behalf of local or national interests, which allegedly hinders accountability for political responsibilities [119]. Various interviewees of Kerker [103] outlined that it is procedurally unjust and undemocratic if there are no possibilities for them to participate in decision-making. "There is a widespread knowledge [of Energiewende issues] in Germany, also with non-experts… so, people who do not engage with energy professionally can and do contribute to the debate as well" [106] (interviewee 1; independent researcher and writer). Disagreement also emerged over how to address other potential procedural injustices. While some civic interviewees demanded public participation at various policy arenas, others feared standstills as a result of too much involvement [103].

Next to the SüdLink and democratic deficits, upheaval in the implementation arena furthermore reflected fears over unfair distribution of energy costs, as portrayed by one interviewee who argues that "in the end, we are the ones who suffer and have to pay more, simply because politicians are raising taxes. It's becoming more and more" [103] (interviewee IL7). Another interviewee states: "challenges to energy security will not find expression through black-outs or brown-outs but will lead to higher energy costs" [102] (interviewee 3). Feed-in

**Table 4**
Scalar justice observations in the implementation arena.

| | Distributive justice | Procedural justice | Recognitional justice | Restorative justice |
|---|---|---|---|---|
| Implementation arena | Policy instruments (e.g., feed-in tariffs) for implementation would disproportionally affect low-income households and reinforce energy poverty.<br><br>Implementation of renewable energy is deemed rather disorganized, resulting in a spatially uneven diffusion, and as a result, an unfair distribution of economic benefits.<br><br>The SüdLink's top-down implementation in the form of overhead transmission lines across regions, as opposed to (rerouted) underground lines, is believed to unnecessarily disrupt landscapes. | Democratic processes for policy decisions are deemed inadequate in certain Länder.<br><br>Untransparent concession processes unfairly benefit experienced and powerful companies over local, new entrants. | Regional identities and cultural imprints are believed to be inequitably considered in policymaking (e.g., subsidization). | Businesses and consumers in some regions call for financial compensation to rectify uneven and unfair electricity prices. |

tariffs, for instance, have both accelerated the Energiewende and led to distributively unjust increases in energy prices for end-consumers [102] (expert interviewee 4 & 10). It is especially low-income households who are disproportionately affected as they pay a larger share of their income on electricity bills (ibid.; expert interviewee 14). Policymakers in this arena are well-positioned to address some of the distributive injustices because they have the responsibility to both implement national missions while safeguarding regional needs. Rehner & McCauley [102] point out that they could mitigate unfair energy prices if feed-in tariffs would consider the different financial capabilities of different income groups. Citizens plead for an 'ability-to-pay principle' in which financially strong stakeholders will contribute to a greater degree [103].

Authors have also suggested other policy actions to mitigate injustices that stem from regional structural change. This includes the development and support of renewable energy businesses in the area of former mines and coal plants, investments in the regional infrastructure and tourism, and financial compensation, re-training or early retirement schemes for former coal industry employees [107]. While some interventions like subsidies for households can be helpful, the intense emotional responses of residents that have re-experienced some historical injustices (e.g., in Lusatia) hint that restorative injustices are not easily or sufficiently addressed [103]. "Indigenous issues have to do with local people's sense that the project would compromise the economic integrity of a region that was already under threat economically, by greatly reducing the demand for locally produced renewable energy" [114, p. 122].

### 4.2.4. Performance arena: Missions coming into being

The performance arena is the space in which strategies, visions, and policies are enacted and come into being [27]. The Energiewende gave way to numerous local energy projects that collectively account for almost half of Germany's renewable energy capacity, and which greatly shifted power from few energy firms to local energy communities [105,120]. Larger infrastructure projects primarily took place in rural areas, where resources for wind, solar, and bioenergy are more ubiquitous [105]. Municipalities often used referenda to poll public opinion, most of which resulted in a slight vote against these large projects [121]. In some regions (e.g., Hesse) the idea of these projects (e.g., grid expansion) are entirely rejected whereas in other regions (e.g., North Rhine-Westphalia and Brandenburg) civic movements mostly advocated for alternatives such as buried cabling, alternative routing, and relocations [113]. As one movement phrases: "We are for the Energiewende, but in an ecologically, economically, and humanly meaningful form: i.e. high-voltage direct current buried cabling" (citizen

initiative 22). The performance arena is particularly relevant because communities across the nation respond to injustices at different moments and in distinct ways [111] as has been captured for regions like Brandenburg [87,105,111], North Rhine-Westphalia [110], and Lusatia [103,122].

In the latter region, a coal-phase out resulted into potential restorative injustices because such job losses would succeed historical setbacks that followed from the German reunification [103]. "It would be just like 1990: You work, you produce, you're fully in the market and suddenly, overnight, two-thirds of all factories are closed" (ibid., civic interviewee IL8). As Kerker et al. [103] points out: "German regions are not merely economic concerns but are deeply intertwined with their historical experiences and cultural identity. Economic disparities are exacerbated by the historical context of these regions, where past injustices and marginalization continue to shape present-day challenges." (p.8).

A more detailed account is provided for the municipality of Engelsberg (located in Baden-Württemberg), which launched a referendum in 2012 for the installation of three wind turbines after already having conducted six public consultations with residents. While vocal opposition was close to non-existent amidst what the local media, Pforzeimer Zeitung, phrased as a "piece of living democracy" [123], only a slight majority of 58,8 % voted in favour of the project and the local politicians "did not interpret the vote from a procedural or strategic point of view ('how high is the protest potential?'), but [rather] from a conventional political one ('we have been supported')" (ibid., p. 219). As Reusswig et al. [123] puts it: "The arena had been measured, and the respective strength of the 'camps' had become revealed now" (p.219). One of the civic opponents commented "We did not know how many else in Engelsbrand were against the project. Are we a small minority of crazy critics, are we many? For whom do we speak finally? The vote made it clear: we are many, and it was worth fighting" [123] (civic interviewee W). As the author concludes: "the vote had a double effect: a *reassuring* one for the proponents, and a *mobilising* one for the opponents" [123, p. 219]. In such cases, civic opposition was commonly framed under the idea of NIMBY (Not-In-My-Back-Yard) to discredit them as emotional, ignorant, and selfish, thus simplifying or even disregarding the actual multi-tenet justice concerns that local residents had [123]. The municipality did not directly approach the critics bilaterally, who now gained the impression that only a few outsiders would profit while residents would have to bear the wind turbines' burdens. Residents later accused Juwi (the project developer) of bribing local politicians and viewed the project developer as "a foreign firm, only seeking profit, and sacrificing not only the beauty of the landscape and the health of the citizens, but

**Table 5**
Scalar justice observations in the performance arena.

| | Distributive justice | Procedural justice | Recognitional justice | Restorative justice |
|---|---|---|---|---|
| Performance arena | The livelihoods of farmers, plant workers, and miners are impaired without (fair) compensation or alternatives. | Local referenda commonly focus on majority votes, but inadequately respond to minority concerns. | Some residents (e.g., Lower Franconians) feel insufficiently represented and understood during decisions, resulting in a fear for one's local identity and community. | Experiences of past injustices succeed and exacerbate present-day concerns over job and identity loss (e.g., Lusatia). |
| | Communities argue that their local neighborhoods and countrysides are unnecessarily disrupted by transmission lines, wind turbines, and monoculture. | Local decision-making processes are sometimes perceived as opaque, biased, and untrustworthy, favoring interests of (external) investors over those of local citizens. | | |
| | Energy projects commonly benefit external investors but do not sufficiently benefit local companies and residents | | | |
| | Low-income households pay a greater share of their income to power, further reinforcing inequality and energy poverty. | | | |

also undermining the rule of law in Germany" [123, p. 220]. The start of municipal elections in 2014 provided a window of opportunity for local movements to establish its own electoral party (Lebenswertes Engelsbrand), ultimately overthrowing vested political parties and relocating the designated wind turbines with 1 km away from the community.

Also in states like Bavaria, civic opposition in combination with bureaucratic hurdles and limited available land hindered the construction of wind turbines [118]. One civic movement advocated that "local people must be better integrated [in decision-making processes]. They frequently feel passed over when it comes to transforming their home environment by planting wind farms" [113] (citizen initiative 2). Bavaria is moreover known for their opposition to grid extensions and view it "as unnecessary for the energy provision of Southern Germany. It profits only the firms behind it […]; moreover, as it will be used to carry power generated from lignite and nuclear sources in Eastern Europe, it contradicts the essence of a sustainable energy transition" [113] (citizen initiative 1). As some interviewees of Galvin [114] point out "We've got farmers whose fields will have to be dug up. […] They fear long-term loss of earnings" (Interviewee 6), and "we [Lower Franconians] get nothing form this transmission line, only that it runs through our land" (Interviewee 5). Lower Franconians are known for their distinct cultural heritage, and Galvin argues that providing them with more decision-making power could have addressed both procedural and recognitional injustices as it would "support their way of life, whiles also reinforcing their sense of identity and community" (ibid., p. 120). Over time, however, civic opposition was increasingly deemed illegitimate with the start of the Russia-Ukraine war [118]. As *Die Welt* stated: "In view of the energy dependence on Russia, the energy transition can of course be accelerated. In particular, the expansion of power lines, which is being fought by the population, could be pushed forward. Distance requirements for wind turbines will be more difficult to justify. What are a few more whirring wind turbines when war and peace are at stake?" [118] (news article 81). Some civic moments reinforced support by starting to emphasize local job creation and the importance of nature conservation, demonstrating how perceptions of distributive justice can change over time [113].

Large cities were likewise not exempt from civil discontent. Civic opposition in Berlin, for example, was not so much concerned with changes in the landscape, but rather with matters of procedural justice in relation to democracy, energy ownership, and equity [111,124,125]. In Germany, network operators manage local energy grids with periodic renewals of their concessions [124]. Once these concessions needed to be renewed, powerful social movements (e.g., Attac) and NGOs (e.g., PowerShift) emerged as a response to democratic deficits and the appeal for a re-municipalisation of power utilities to regain control over incumbents such as Vattenfall [111]. Despite substantial civic support through a petition for such changes in Berlin's energy system (600.000+ voters), no re-municipalisation took place due to a defensive campaign of Vattenfall in combination with local politics and institutional barriers in the tendering process [111,124]. Incumbents claimed excessive grid prices for new concessionaires, refused to hand over relevant data, and campaigned against severe job loss and inefficiencies [126].

## 5. Discussion

This paper focused on the justice deficit of mission-oriented innovation policy (MOIP) by examining how distributive, procedural, recognitional, and restorative injustices were induced and addressed across mission arenas of the German Energiewende. We applied a qualitative meta-analysis to identify, synthesize, and reinterpret findings of 26 justice-related case studies that pertain to this mission context, but which have not yet been considered through a mission lens. Section 5.1 first discusses our main findings in relation to our research questions, after which Section 5.2 discusses the theoretical implications of our work for MOIP. Hereafter, Section 5.3. points out limitations relevant for the interpretation of our work.

### 5.1. Findings

In answering what kind of injustices emerge in mission arenas (RQ1), we find that justice concerns form major drivers in the strategic arena for the legitimization of the Energiewende. For example, Germany's coal and nuclear phase-out was motivated by concerns over distributive justice (both environmental and intergenerational). Despite historical turbulence in the strategic arena, our meta-analysis indicates that the current opposition for the Energiewende is not so much rooted in *whether* the mission is required but rather *how* it is envisioned, implemented, and performed in the respective arenas. Amongst others, the perceived injustices relate to how human lives are affected in unequal and possibly unfair ways, while citizens generally have limited influence and say over how decisions are taken (see Tables 2–5). In some cases, regional identities and historical wrongdoing are insufficiently recognized and considered. A substantial proportion of these observed injustices are of a distributive and procedural nature – which is consistent with the uneven coverage of the broader energy justice literature [127]. On the one hand, this could mean that (energy) missions are more likely to induce some forms of injustice over others. On the other hand, such skewed observations could also reflect bias in current research on the Energiewende. It is also noteworthy that there are limited accounts of injustices concerning non-human actors. Such a human-centric focus may promote social justice but can be at odds with eco-authoritarian frameworks that assign priority to environmental goals over social ones. An exclusive emphasis on either social justice or environmental justice is therefore insufficient and "in many cases, there are no 'win-win' scenarios" [19, p. 1].

When considering how injustices make passage from one mission arena to another (RQ2), we find that justice observations are most prevalent in the performance arena while the policy decisions leading up to them are rooted in 'higher level' arenas. For example, local residents sometimes felt excluded from policymaking processes, while having to unfairly bear the corresponding burdens (e.g., financial). Another vivid example hereof is the initiation of the North-South SüdLink transmission lines that were envisioned in the programmatic arena, but which experienced resistance by locals across various performance arenas as these lines disrupted their communal landscapes. Such examples of mission injustices confirm our hypothesis that policy decisions in 'higher level' arenas can induce injustices after they find passage to 'lower level' arenas, indicating that mission justice should be viewed as a *multi*-scalar phenomenon. Hence, "what is described simply as Energiewende is actually a generic term for a multitude of energy struggles, on different scales [or arenas], which are led by a multitude of actors through diverse means" [128, p. 1]. As the work of Paul [106] suggests, conflict and energy struggles thus take place across all arenas of the Energiewende and co-produce overarching perceptions of injustice.

The results hint at a number of ways mission injustices can be prevented or addressed (RQ3). Scholars suggest that this requires reflexive learning, as a central policy mechanism, to better understand activities across mission arenas [21,27,28]. This would in turn help prevent and address injustices imposed on others. In many cases, doing so means that the MOIPs that are envisioned and enacted in the programmatic and implementation arenas would need to reflect or be adapted to local socio-spatial contexts that are associated with performance arenas. However, our studies report how difficult the necessary reflexive learning is in practice. For example, Reusswig et al. [123] and Moss et al. [111] describe how opposition in Engelsberg and Berlin, respectively, emerged as small movements that were symptomatic of local procedural and recognitional injustices. Their small, latent but powerful disposition suggests that perceived injustices are challenging to sense and that simultaneously "it is not the total number of opposition that counts, but the ability [of actors] to mobilise local critical masses" [123, p. 225]. While justice-related case studies for the Energiewende rarely capture policy learning processes explicitly, they do point at various policy instruments that foreground learning, and which could help address or

prevent mission injustices. For instance, subsidies and compensation schemes, that are established upon an ability-to-pay principle, are commonly mentioned as a means to relief unfairly distributed financial burdens [102,103,107,118]. However, even if policymakers succeed in sensing and understanding injustices, they likely face complex and contested trade-offs when addressing them. For instance, Germany's nuclear phase-out was compensated with fossil-based energy, suggesting that responses to one type of injustice (e.g., safety concerns over nuclear power) may exacerbate other injustices (e.g., environmental concerns). Shaping "a just transformation [therefore] requires awareness and consideration of various (sometimes contradictory) justice perceptions" [103, p. 10].

### 5.2. Theoretical implications

In terms of theoretical implications, our qualitative meta-analysis shows the significantly different justice dynamics across contexts. Germany shares similarities with the notion of decentralized governance as it is characterized by federal states that each have the legislative authority to substantiate national agendas and complement national policies in their respective regions. This means that Germany has many diverse implementation and performance arenas that are spatially distributed across the country, each acting as unique "pre-formatted carriers of social structures and processes" [89, p. 2]. Arenas at different places therefore express dissimilar justice concerns. In other words, our work implies that no such thing as a *single* implementation and performance arena exists in Germany, but rather that these are plural and spatially diverse. Against such multi-spatial and multi-scalar arenas, our analysis shows that granting actors (e.g., local authorities) the option to set their own targets and strategies in the programmatic, implementation, and performance arenas allows them to give greater interpretation and substance to the mission strategy through processes of 'anchoring' [75], 'regioning' [36], and 'localisation' [76]. In contrast, national solutions like the SüdLink demonstrate how top-down policy decisions can collide with the local realities of residents in regions like Lower Franconia. There seems to be a need for multi-spatial and multi-scalar mission governance, which resonates with the argument of Wanzenböck and Frenken [51] that missions are most likely to thrive once decisions are taken as closely as possible to the citizen. This can do greater justice to local contexts, if this is balanced against the need for horizontal coordination as suggested by work of [112]. Cases like those of Engelsberg and Berlin show that the success of translation depends on the institutional landscape and especially the political willingness of decision-makers to sense and respond to local concerns.

Multi-spatiality and multi-scalarity furthermore hint at the relevance of multiple temporalities when considering the inception, perception and resolution of injustices because time (*chronos*) and timing (*kairos*) are likewise social, plural, and contested across space and scale [129]. Multi-temporality draws attention to the different meanings stakeholders assign to time-related notions (e.g., 'urgency', 'fast/slow', 'accelerating'). Different arenas are therefore associated with distinct temporal views. Intergenerational justice concerns expressed in the strategy arena of the Energiewende, for instance, exemplify how the respective stakeholders operate on decade-long time horizons while many performance arenas express claims in relation to the 'here and now'. Such temporal differences across space and scale lead to different judgments over the right timing of justice-making (e.g., when restoration is appropriate). Put differently, when injustices are created, experienced, and addressed across different mission arenas and ensue passage, they relate to time and temporality in different ways. Conflicts can then arise when actors proceed from different temporal dimensions and engage with justice-making practices that are arrhythmic with the temporalities of other actors. As a result, "the passage of time [and timing] makes it more difficult to scrutinize a decision-maker's performance, to detect mistakes and abuses, and to correct them" [130, p. 52]. Following Stirling et al. [131], we argue that a greater recognition of

temporal, spatial, and scalar complexities would help policymakers reconstruct missions from relatively monothetic 'one-size-fits-all' policy approaches to more polythetic ones that allow for multiple and diverse ways of delivering mission justice. All of this suggests that an understanding of mission justice requires scrutiny of how justice-making and arena politics differ across time, space and scale (Fig. 3). Only then can be determined whether transformative missions are conducive of just transitions.

### 5.3. Limitations

Several limitations should be accounted for. Similar to other cross-sectoral MOIP packages, the Energiewende is a relatively large unit of analysis. While our system-wide analysis identified, synthesized, and reinterpreted major justice-related observations from 26 cases studies that draw from at least 1569 data points, we recognize that such an analytical breadth may come at the cost of its analytical depth. Our non-exhaustive analysis should therefore be viewed as a system analysis, rather than a sectoral or instrument-specific analysis, aimed at providing a more explicit and grounded understanding of the justice implications that MOIPs may engender.

Closely related is the limited ability of our analysis to identify spillovers of injustices beyond our delineated mission context. We speculate that injustices in relation to the Energiewende may have cascading effects to other domains. For instance, the unequal rise of energy prices may affect a household's disposable income, which in turn can affect the extent to which certain communities have access to a healthy, affordable, and culturally sensitive diets (sometimes labelled as food justice [132,133]). In other words, an injustice captured by our analysis may in turn have complex, non-linear effects on 'external' systems, which should be taken into account when interpreting our work.

Lastly, qualitative meta-analyses are sometimes critiqued for their staleness over time. Social phenomena and experiences evolve, and limited guidance exists for when qualitative syntheses become outdated. We therefore emphasize that our findings reflect the multiple temporalities of the included case studies, and recognize that policymaking specific to the Energiewende may have conduced, prevented, or addressed injustices in novel, more recent ways.

## 6. Concluding remarks and future research

This study aimed to illuminate some of the scalar justice implications of mission-oriented innovation policy (MOIP). It did so by studying insight related to distributive, procedural, recognitional, and restorative justice across the strategic, programmatic, implementation, and performance arena of the German Energiewende mission. We conducted a qualitative meta-analysis of 26 justice-related case studies, that collectively draw from at least 1569 data points (e.g., interviews), to aggregate empirical insights and reinterpret these through a MOIP lens.

Our analysis revealed some of the ways through which mission injustices are conduced, make passage, and form objects of policy learning at different mission arenas across scale, space, and time. We therefore conclude that mission justice is a multi-scalar, multi-spatial, and multi-temporal phenomenon, capturing the plural ways in which injustices are caused, perceived, and addressed across arenas. Given the central role that justice has played in the Energiewende, our results furthermore underscore that injustices should not be viewed as inevitable 'side effects' of missions. Instead, they are politically negotiated outcomes of deliberate policymaking processes that, in some cases, may be symptomatic of policy failures. Reframing injustices as such, shifts them from passive byproducts to preventable outcomes, and attributes mission injustice to the decisions for which policymakers are responsible. It additionally invites critical examination of mission governance, potentially cultivating forms of accountability. Preventing injustices would thus require that their consideration becomes an integral and moral part
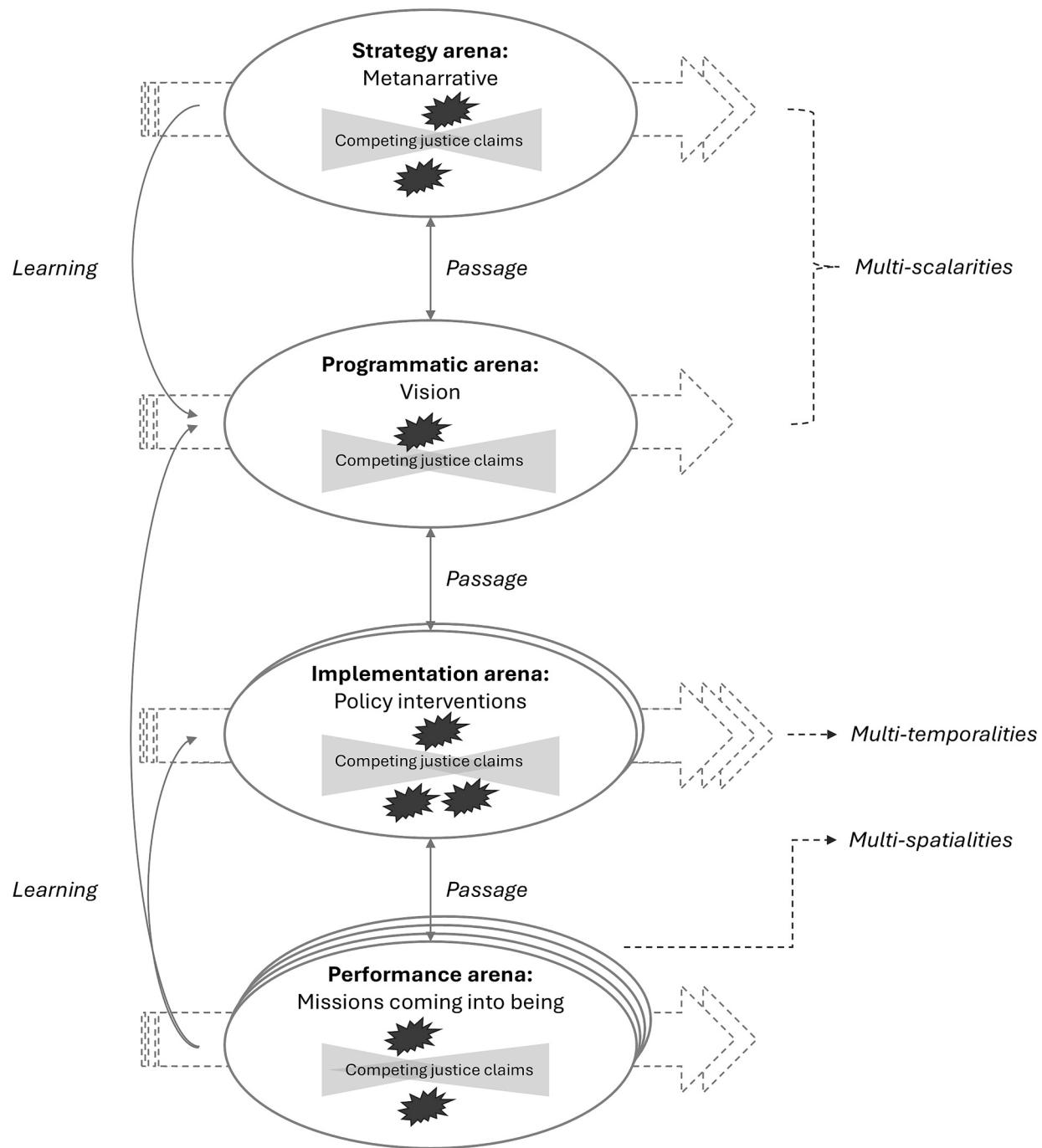
**Fig. 3.** Competing justice claims across multi-scalar, multi-spatial and multi-temporal mission arenas. Here, multiple circles denote a multitude of possible arena spaces, whereas different arrows signify plural temporalities associated with them.

of a mission's formulation and design. This is imperative because the pursuit of unjust transitions is not sustainable – at least not in the social sense – and would therefore undermine the transformative intentions of many MOIPs. In some cases, this means that missions should not be treated as a mere mix of supply and demand policies, but rather as a broader transformative approach that is interwoven with a constellation of other policy instruments (e.g., compensation schemes) from different domains to address injustices.

Future research can advance our analysis by deepening our understanding of the multi-spatial and multi-temporal nature of multi-scalar justice dynamics of mission contexts. In the case of the Energiewende, for instance, justice perceptions changed in response to the Ukraine-Russia war as energy autonomy and resilience gained greater

importance for some stakeholders in comparison to initial concerns over transmission lines and wind turbines [118]. Such events radically change the way justice is perceived and pursued across space, scale, and time. Longitudinal and historical analyses that acknowledge changing justice considerations across such dimensions could provide more insights into how competing justice claims within and beyond mission arenas can be navigated by policymakers. Ultimately, we hope that these insights will support moral reflection necessary for missions to become more just. Such insights and reflection would not so much help answer the question *whether* 'the ends justify the means', but rather *how* both ends and means of MOIP can be formulated and implemented in ways that are fairer, more equitable, and more respectful to both humans and non-humans in urgent challenge-led contexts.

## CRediT authorship contribution statement

**Martijn Wiarda:** Writing – original draft, Validation, Supervision, Project administration, Methodology, Investigation, Formal analysis, Conceptualization. **Elisa Rodríguez-Gironés:** Writing – review & editing, Writing – original draft, Validation, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Neelke Doorn:** Writing – review & editing, Validation, Project administration, Methodology, Funding acquisition, Conceptualization.

## 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.

## Appendix I. – Case studies

| Reference | Topic | Data collection |
| --- | --- | --- |
| Arifi & Winkel, 2021 | Local opposition to wind energy expansion | Grey literature ($n =$ undisclosed), semi-structured interviews ($n = 27$), participant observation |
| Berlo et al., 2017 | Preservation strategies of municipal utilities | Grey and academic literature ($n =$ undisclosed) |
| Borshchevska, 2018 | Competitiveness and energy transition risks in the German industrial sector | Grey literature ($n = 218$) |
| Ferguson-Cradler, 2022 | Corporate strategy in response to the nuclear phase-out | Grey and academic literature on four utilities ($n =$ undisclosed) |
| Fink et al., 2022 | Alignment of local and state-level political party positions on grid expansion | Party programs and publications for parties in twelve municipalities ($n = 39$) |
| Funcke & Ruppert-Winkel, 2020 | Discourse coalitions surrounding the (de)centralization of the German electricity system | 'Helicopter' interviews ($n = 11$), in-depths interviews ($n = 14$), and grey literature ($n = 300$) |
| Gailing, 2016 | Exploring power relations in the Energiewende | Grey literature ($n =$ undisclosed), semi-structured interviews ($n = 5$), two stakeholder workshops (30 participants total), a focus group ($n = 7$) |
| Galvin, 2018a | Power and social acceptance in multi-level policymaking on renewable energy production | Grey literature ($n =$ undisclosed), semi-structured interviews ($n = 12$) |
| Galvin, 2018b | Local opposition and acceptance of grid expansion | Grey literature ($n =$ undisclosed), semi-structured interviews (n = 12), participant observation |
| Hake et al., 2015 | Historical account of energy politics leading to the Energiewende | Grey and academic literature ($n =$ undisclosed) |
| Kerker et al., 2024 | Justice perceptions of local uninvolved citizens in the Energiewende | Grey and academic literature ($n =$ undisclosed), Semi-structured interviews ($n = 28$), dyadic interview (n = 1), six focus groups (31 total participants) |
| Krick, 2017 | The role of advisory committees in German energy policy and its social acceptance | Grey literature on 13 advisory committees and 4 state-sponsored organizations (n = undisclosed) |
| Leipprand & Flachsland, 2018 | Actor framings, positions and perceptions in the Energiewende | Grey literature including press releases, position papers, speeches, and online newspaper reports ($n = 100$) |
| Morton & Müller, 2016 | Local actor narratives and scripts surrounding coal mine expansion | Ethnographic field work and interviews ($n = 50$) |
| Moss et al., 2015 | The role of organizations in shaping institutional change and local articulations of the Energiewende | Grey literature ($n =$ undisclosed) and expert interviews ($n =$ undisclosed) |
| Ohlhorst, 2015 | Multi-level governance and the interplay of national and subnational policies in the Energiewende | Grey and academic literature ($n =$ undisclosed) |
| Paul, 2018 | Conceptualizing energy transitions as historical and political struggles | Grey literature ($n =$ undisclosed) and semis-structured interviews (n = 7) |
| Rehner & McCauley, 2016 | Drivers and impacts of the phase-out of nuclear energy in Germany | Semi-structured interviews ($n = 20$) |
| Reußwig et al., 2016 | Conflict dynamics in local opposition to wind energy | Grey literature ($n =$ undisclosed), semi-structured interviews (n = undisclosed), participant observation |
| Rocholl & Bolton, 2016 | Contested ownership and governance of Berlin's electricity distribution grid | Semi-structured expert interviews ($n = 15$) |
| Sait et al., 2019 | Sustainable energy transitions in German cities | Grey literature ($n =$ undisclosed), interviews ($n = 6$) |
| Schmid et al., 2015 | Actor views and struggles surrounding centralized vs decentralized electricity infrastructure visions of the Energiewende | Grey and academic literature ($n =$ undisclosed) |
| Töller et al., 2024 | Opposition to wind energy projects through local referenda and lawsuits | Grey literature survey to identify cases of local referenda (n = 28) and lawsuits ($n = 90$) |
| Viétor et al., 2015 | Barriers to the uptake and integration of decentralized CHP in the Ruhr Valley | Grey literature ($n =$ undisclosed) and semi-structured interviews (n = 11) |
| Weber et al., 2017 | Discourses of acceptance and dissent in citizen initiatives | Grey literature survey to identify citizen initiatives and their positions ($n = 370$) |
| Wiertz et al., 2023 | Post-war shifts in the public discourse on the Energiewende | Grey literature including newspaper articles ($n = 179$), tweets ($n = 100$), talk show transcripts ($n =$ undisclosed) and parliamentary protocols ($n = 8$) |

## Data availability

The data used in this article is presented in the appendix.

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