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The rescaling of institutional rationalities for shaping opportunity spaces

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Abstract. By integrating the concept of opportunity spaces into the debate on multi-scalarity in transitions, this paper explains how and why actors engage in institutional change processes across scales. Opportunity spaces for change conceptualize a multi-scalar institutional architecture as structure for agency and take account of the future-past-dimension of agency. Actors rescale institutional rationalities by carrying out institutional work across scales with the intention to strengthen an industrial path. Our conceptual elaborations are illustrated by in-depth interviews and participant observation of industry associations in the market for residential storage systems in Germany. After having constructed and exploited a national opportunity space for this niche, particularly industry associations and companies engage in institutional work fostering the national implementation of EU legislation and affecting legislation, discourses and standards at a European scale. While institutional semi-coherence is found as constraining condition for rescaling institutional rationalities, holding positions at multiple scales enhances agency.

Keywords. Multi-scalarity, transitions, agency, opportunity space, institutional work, energy

JEL codes. R11, O33, R58, L50

1 Introduction

A key question in transition studies is how new technological solutions or modes of consumption and production challenge established, often rigid and inert socio-technical systems (Markard et al. 2012; Geels 2002). The rigidity of these systems is usually attributed to the presence of socio-technical regimes, which consist of highly institutionalized formal and informal rules that have co-evolved with technologies and actor-networks over extended periods of time (Markard & Truffer 2008; Kemp et al.

1998). The evolution of such systems has traditionally been analyzed within nation states, regions or even cities, based on the (often taken for granted) premise that the relevant technical and social elements as well as policy and planning interventions share national, regional or even urban spatial boundaries (Miörner & Binz 2021). Consequently, the empirical focus of transitions studies mirrors this pre-set 'containerized' view, especially in the sector of energy, with studies focusing on the German energy transition, smart grid experiments in the Netherlands or the wind-industry in Denmark or Norway (Bauer & Fünfschilling 2019; Lauber & Jacobsson 2016; Strunz 2014; Verbong et al. 2013).

Recent contributions have developed a more nuanced understanding of multi-scalar niche-regime interactions that are the result of dynamics playing out in various places and at different levels of governance (Madsen 2022; Miörner & Binz 2021; Binz et al. 2020; Fünfschilling & Binz 2018). Hence, conceptualizing transition trajectories is not a question of distinguishing 'global' regime and niche structures from various 'national' and 'local' variants thereof, but requires taking account of socio-economic structures at different spatial scales and in various places influenced by temporal dynamics and sector-specific characteristics (Miörner & Binz 2021; Fünfschilling & Binz 2018; Truffer & Binz 2017; Binz et al. 2016; Wieczorek et al. 2015; Raven et al. 2012; Coenen et al. 2012). Whereas, for instance, the water sector might be shaped by a very strong global regime structure, the energy sector shows considerable spatial variation across nation states in spite of transnationally acknowledged targets towards decarbonization (Fünfschilling & Truffer 2014; MacKinnon et al. 2019; Markard 2018; Četković & Buzogány 2016). Thus, identifying the relevant scales at which actors strategically engage in institutionalizing or challenging regimes must be a part of the analysis instead of being an a priori premise.

A multi-scalar view on institutionalization particularly holds potential for explaining strategic agency seeking to hinder or promote transitions. Drawing on the notion that regimes are based on semi-coherent institutional rationalities that are continuously challenged and reinforced, it becomes crucial to focus on the diffusion of niche and regime rationalities across space beyond their place of origin (Bauer & Fünfschilling 2019; Fünfschilling & Binz 2018; Sengers & Raven 2015), but also across scales (Madsen 2022; Miörner & Binz 2021). The latter requires shedding light on how actors rescale institutional field logics, technical practices or core values from their immediate local, regional, national or trans-local contexts into regime structures at higher scales. At the same time, we also need to better understand how dominant (global) regime and niche rationalities are then rescaled back into (sub-)national levels inducing change in contexts with highly diverse structural preconditions (Miörner & Binz 2021). While shifts in power dynamics (Madsen 2022), actor types (Roebke et al. 2022; Miörner & Binz 2021; Kivimaa et al. 2019), actors' networks (Fünfschilling & Binz 2018; Bauer & Fünfschilling 2019) or types of transition trajectories (Miörner & Binz 2021) have been the subject of recent research, actors' concrete strategies across different scales targeting the rescaling of technologies and rationalities remain unexplored.

This paper contributes to this debate by analyzing activities and strategies targeting the rescaling of institutional rationalities for promoting transitions. In operationalizing strategic agency across scales, we mainly draw on the concepts of institutional work (Lawrence & Suddaby 2006) and opportunity spaces for change (Grillitsch & Sotarauta 2020). The latter has been introduced in the field of human geography and proven fruitful to operationalize scales, since it views agents as being embedded in an opportunity space, which is conceptualized as a stratified multi-scalar architecture capturing "the time or set of circumstances that make a change possible". Agents are able to structure opportunity spaces, for instance, by rescaling institutional rationalities, which foster specific industrial paths. We operationalize the required strategies and practices with the concept of institutional work, and ask *how actors engage in the rescaling of institutional rationalities in order to shape opportunity spaces?* Taking account of multi-scalar institutional arrangements, we further focus on the questions of *which actors engage at which scale in rescaling institutional rationalities, and what are enabling or impeding conditions for such institutional work.*

The market for residential energy storage systems in Germany serves as empirical case. Combined with photovoltaics, these battery systems make it possible to store surplus energy beyond current consumption and, thus, enhance self-production and self-consumption, so-called 'prosuming' of electricity. In Germany, this market is very dynamic, triggered by local preconditions such as high energy prices and low feed-in tariffs, but still constrained by regulatory barriers, such as fees, charges, and metering requirements. Against this backdrop, actors, such as industry associations or electricity providers, engage at a national but also European scale in strategic rescaling efforts. At a national level, they claim a thorough implementation of EU regulation, which is advocating prosuming (Zademach & Käsbohrer 2022). At EU level, the benefits of residential storage systems, technical standards and regulatory requirements are put forward. By translating institutional rationalities bidirectionally, actors aim at improving market conditions for storage systems at a national scale and even tapping opportunities at a broader European scale.

After presenting the conceptual background and methodological approach, the paper characterizes the opportunity spaces at a national and EU level and shows how agents try to structure them by means of institutional work. Factors and conditions enabling and constraining these efforts are discussed afterwards.

2 An institutional perspective on the dynamics between scales and agency

2.1 Institutional layers and opportunity spaces for change

In taking on an institutional perspective on scales, we find inspiration in Grillitsch (2015), who developed the approach of institutional layers in the context of regional economic development. Relying on insights from the literature on varieties of capitalism, innovation systems and evolutionary economic geography, Grillitsch (2015) highlights the importance of understanding the arrangement and interdependencies of institutional layers of different types and geographical scales that intersect in a given area for scrutinizing the co-evolution of institutional change and emerging industrial paths. Miörner and Binz (2021) conceptualize layers refined to spatial scales in transition studies. In a similar way, , Miörner and Binz (2021, 175) "bring forward a conception of spatial scales in socio-technical systems defined as the structure of actor-networks in combination with the territorial anchoring of the institutional arrangements underpinning regime (and niche) rationalities in the system". Thus, 'layers' mean the conjunction of actor-networks and related institutions in the socio-technical system with different properties.

Institutional layers capture regime and niche structures in which actors are embedded. For a better understanding of why, how and with what outcomes (both intended and unintended) actors engage in institutional change processes, we suggest the integration of the concept of opportunity spaces in order to link a multi-scalar perspective of institutions as structures to agency. Agency is understood as a "temporally embedded process of social engagement, informed by the past (in its "iterational" or habitual aspect) but also oriented toward the future (as a "projective" capacity to imagine alternative possibilities) and toward the present" (Emirbayer and Mische 1998, 962). Analogously, opportunity spaces embark from historically developed structures, but are future-oriented capturing the possible future development trajectories. Defined as "the time or set of circumstances that make a change possible" (Grillitsch and Sotarauta 2020, 713) opportunity spaces capture the broader context of what is possible and include infrastructures, knowledge and industrial development. Institutions, however, are an important constituent element of opportunity spaces. Actors are embedded in opportunity spaces that are specific to a territory, industry, and time in question, which also shapes their ability to develop and exploit opportunity spaces. Thereby, opportunity spaces account for actors' and organi-

zations' strategic deliberations and expectations about the future, in the sense that agents aim at inducing institutional changes for shaping an opportunity space and, thereby the future development of a niche.

The perception of opportunities and the capabilities to realize them are specific to individuals or sets of individual agents, yet also influenced by the context in which the agents are embedded (Kurikka et al. 2023). This implies that opportunity spaces vary not only between agents in a particular territory (e.g., a region or nation) but also differ and change over time and across territories. In the context of regional change processes, Grillitsch and Sotarauta (2020) grasp this variation by means of three levels: First, the time-specific opportunity space captures possibilities and constraints for change given a global stock of knowledge, institutions, and resources at any moment in time. Second, the region-specific opportunity space refers to local preconditions influencing the expected change potential, such as industry structure, institutional configurations, and regional support systems for innovation and entrepreneurship. Third, the agent-specific opportunity space reflects the individual perception of opportunities and capabilities to induce change and is influenced by an agent's competences, position in social networks, expectations, past encounters, and experiences. It is important to note, however, that it depends on the empirical context and research question, which levels of opportunity spaces have analytical purchase (Sotarauta and Grillitsch 2023).

Multi-scalar institutional architectures relate directly to the stratification of opportunity spaces, and the identification of relevant institutional layers is an approach to unveil this stratification. Institutional layers can have a territorial and non-territorial character. Laws and regulations, but also aspects like local culture are effective in specific territories. Other institutional layers, for instance, standards or conventions in a particular sector or industry are relevant wherever the sector or industry is present (non-territorially defined cross-scalar layers). Actors and organizations can be subject to more than one layer allowing for all sorts of overlaps (see Fig. 1). Appreciating the importance of institutions, Grillitsch and Sotarauta (2020) argue that institutional entrepreneurship is one of the most essential forms of change agency directed at shaping opportunity spaces. Linking this to the insight that transition processes need to be investigated from a multi-scalar perspective, it is necessary to account for scalar barriers and opportunities for change, such as supportive policies, the market size of technologies, narratives or networks and the potential for interaction. Considering multi-level governance systems (e.g., the EU), institutions, such as policies and planning paradigms, affect opportunity spaces by shaping the preconditions for innovation and the relative potential for diffusion between technological solutions, thus, promoting alternative modes of production and consumption (Roebke et al. 2022). Following Grillitsch and Sotarauta's (2020, 718) call "for an investigation of the agentic processes, their embeddedness in multi-scalar networks and institutional contexts", we highlight the relevance of agents reflecting on and potentially aiming at inducing institutional changes across scales for shaping opportunity spaces.

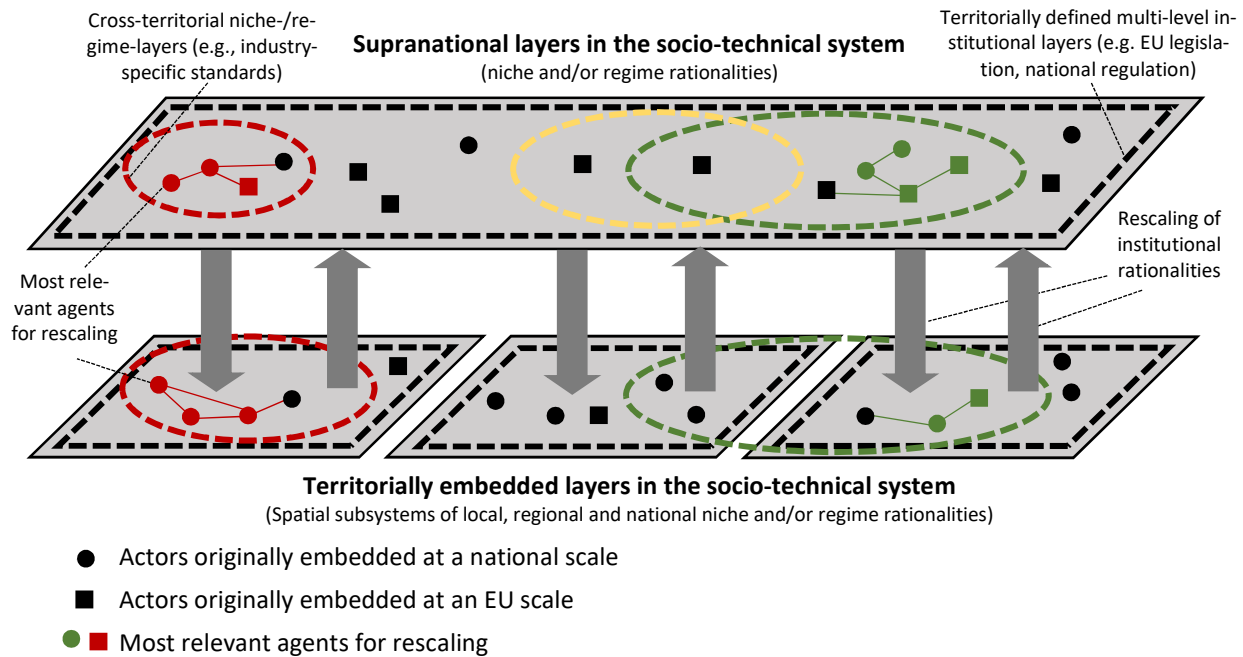


Figure 1: Conceptual distinction between supranational and territorially embedded layers in a socio-technical system. Own elaboration, based on Grillitsch (2015) and Miørner & Binz (2021).

2.2 The rescaling of institutional rationalities

Agents may aim at spreading institutions beneficial to them or altering the importance of institutional layers, also by lobbying and coalition building (Grillitsch 2015). Transferred to layers associated with geographical scales, this may be reached by developing and diffusing institutional rationalities across scales (Hassink et al. 2019). Recent contributions (Madsen 2022¹; Miørner & Binz 2021) have addressed this gap by highlighting the process of rescaling. Miørner and Binz (2021, 176) refer to rescaling as the translation of institutional rationalities between various scales, describing “how technologies, practices, norms and values prevailing in one layer in the socio-technical system are translated into the regulatory, normative and cultural-cognitive structure of other layers and eventually alter the global socio-technical regime”.

Rescaling goes along with constant translation processes mediating between the supranational and territorially embedded (national, regional, urban, etc.) layers in the socio-technical system (see again Fig. 1). A sector will institutionalize a guiding rationality through, for instance, international events, standards, ‘early career’ networks, etc. on a supranational level. In territorially embedded layers, these rationalities have to be contextualized and specified since they need to be adjusted to the prevailing structural preconditions (Heiberg et al. 2022; Miørner & Binz 2021). Concerning, for instance, multi-level governance systems the translation of rationalities mainly concerns overarching targets and policy frameworks, which need to be integrated at a nation state level. In some sectors that are strongly nationally anchored, such as the provision of electricity (MacKinnon et al. 2019; Markard 2018; Četković & Buzogány 2016), tensions and contradictions with established regulations, technical best practices, domestic interest groups and assigned responsibilities and power might occur, potentially resulting in alterations and new combinations of institutional logics.

¹ Madsen (2022) views rescaling as process of changing the scalar arrangement of a socio-technical system, when policies and politics are shifted from one scale to another, potentially including shifts in power and control over the system. Thus, some (regime) actors may be empowered, whereas other (niche) actors are disempowered. This paper mainly follows the conceptualization by Miørner & Binz (2021).

At the same time, global standards, established technical solutions or core values usually consist of a selection of best practices originating from territorially embedded contexts that have been de-contextualized and institutionalized at a supranational scale by influential and well-connected actors. Consequently, in most sectors, regimes will not equally represent all socio-technical configurations and rationalities existing in a field, but rather a subset of elements (Miörner & Binz 2021). Again, this applies especially to multi-level governance systems, which per definition are characterized by distributed political control and overlapping competencies among multiple levels of governments, but also other non-governmental actors, such as NGOs or industry associations, which actively contribute to legislative processes (Hooghe & Marks 2021; Bache 2012; Jordan 2001). Thus, in both directions, rescaling does not mean a direct transposition of rationalities, but rather an active engagement of actors to shape the institutional environment at one level with the explicit intention to coproduce effects on another level. In this process, actors may also make active use of institutional properties at one level to affect another.

2.3 Institutional work as a lens for agency across scales

The Institutional work-framework (Lawrence et al. 2009; Lawrence & Suddaby 2006) serves as lens that operationalizes micro-level activities in attempts to rescale institutional rationalities. This concept has increasingly been featured within transition studies (e.g., Löhr et al. 2022; Kivimaa et al. 2021; Becker et al. 2021; Kainiemi et al. 2020; van Doren et al. 2020; Duygan et al. 2019) in order to elucidate actors' possibilities to (re)produce institutional environments and overcome the structure-agency paradox (Fünfschilling & Binz 2018; Sotarauta & Pulkkinen 2011; Battilana et al. 2009).

Lawrence and Suddaby (2006) identified distinct practices of institutional work: While some activities aim at the creation of institutions by developing rules as well as rewards and sanctions enforcing that rules (e.g., *advocacy, educating, changing normative associations with novel innovations*), the maintenance of institutions requires ensuring compliance with existing institutions (e.g., by *policing or deterring*). Practices aiming at the disruption of institutions undermine the compliance of actors with institutions by making them less attractive and delegitimizing them (e.g., by *officially changing rewards and sanctions*; please see Appendix 1 for a full list of the original institutional work types by Lawrence and Suddaby 2006).

On a more general level, Lawrence and Suddaby (2006) depicted two main forms of work: activities aiming at the mobilization of resources, such as political power, money, knowledge or social capital, for establishing regulations, securing knowledge through patenting or establishing networks with powerful actors, and efforts targeting the (de-)construction of rationales for shaping discourses and, thus, (de-)legitimizing an innovation (Fünfschilling & Truffer 2016). Taking scale-based discourses into account proves advantageous for operationalizing opportunity spaces as narratives reflect how actors see the world, how they perceive opportunities and limitations, and how they motivate their actions (Sotarauta & Grillitsch 2023).

From this discussion, we aim at addressing the following research questions: ***How and why do actors engage in the rescaling of institutional rationalities with the intention to shape opportunity spaces? Which actors engage at which scale in rescaling institutional rationalities?*** For taking account of the structural context the actors are embedded in, we aim at shedding light on the question of ***what are enabling or impeding conditions for such institutional work.***

3 Case selection, methods, and data

3.1 Case selection: the market for residential storage systems in Germany and the EU

Initially, this case study has been concerned with the market for residential storage systems with a maximum capacity of 30 kWh in Germany. Combined with photovoltaics, these storage systems allow

for enhancing self-production and self-consumption of electricity in private households by storing surplus energy beyond current consumption, also known as prosuming (Figgner et al. 2021; Tepe et al. 2021; Kairies et al. 2019). Besides self-consumption, large numbers of digitally aggregated photovoltaic and battery systems (so-called virtual power plants) can provide frequency containment reserve in order to balance variation of mains voltage through storing or withdrawing power during times of electricity interruption or overproduction (Sousa et al. 2019). Moreover, such virtual power plants can take advantage of price volatility in international electricity trade through timed electricity sales. Another use case are so-called energy communities organized by a third party aggregator, enabling members to sell and buy electricity from other peers depending on their current demand or surplus production (Blasch et al. 2021; Mlinarič et al. 2019).

As regards relevant institutional layers for analysis, we stress the importance of not setting the scalar boundaries a priori. Instead, they are the result of analyzing strategic agency in attempts to support or hinder transition processes (Madsen 2022; Miörner & Binz 2021; Jolly et al. 2020; Coenen et al. 2012). Our empirical material suggests taking the national as well as the EU level into account². Since aforementioned business models are hampered by regulatory barriers, national energy regulation is subject to institutional work (Zademach & Käsbohrer 2022). The strong national anchoring regarding the provision of electricity is reflected by earlier case studies usually limiting the analysis to national systems (see introduction). Since EU legislation is concerned with residential storage systems and needs to be transposed to a national level, agents also make active use of this scale in order to influence their national opportunity space. The relevance of EU legislation and policy targets is reinforced by current political events (energy crisis) and by materiality given liberalized European electricity markets. Hence, contradicting to an ontological priority to local and national levels, the market for residential storages systems along with its institutional architecture represents a „critical“ case (Flyvbjerg 2006) for illustrating our conceptual framework and informing theoretical issues in agency research (Yin 2014).

3.2 Data collection and analysis

The empirical analysis draws on the triangulation of different methods including desk based research of secondary data, participant observation and qualitative interviews (Yin 2014; Eisenhardt & Graebner 2007). Desk based research (e.g., market data, reports of utilities, ministries and industry associations, company websites and legal texts) enriched our knowledge about current institutional, particularly regulatory, developments at a national and EU scale. We further draw on participant observations during 42 working group meetings of a German industry association in the electricity system, which lasted between 45 and 180 minutes and took place between September 2020 and February 2023. The meetings' subjects cover regulatory issues, market trends or innovative developments (see Appendix 2). The association's members are mostly affiliated with the national scale electricity sector (e.g., electricity providers, Distribution System Operators, DSOs, storage manufacturers).

First, 32 semi-structured interviews with national energy sector experts and industry leaders, ranging from academics, government officials and lawyers to representatives of utilities, industry associations and DSOs, were conducted (see Appendix 3). The first interview partners either were members

² The regional scale in Germany (states, *Bundesländer*) also turned out to advocate residential storage systems (mainly due to resident companies and projects as well as local resistance to grid expansion). However, sector experts consider governing the energy supply system and energy regulation largely a national affair without relevant decision-making power at the regional level. The main legislative acts do not require the approval of the Federal Council (*Bundesrat*). On a European scale, the *Bundesländer* maintain permanent representations. Notwithstanding, our empirical material suggests that these representations are not really involved in lobbying activities. Instead, they act as intermediaries delivering information from the national or regional scale, but rather upon request than on their own initiative.

of the aforementioned industry association or identified through desk-based research, whereas further experts were sampled based on recommendations from those interviewed (snowball method). In the same way, ten EU level actors were identified (representatives of EU institutions, industry associations, NGOs, corporate representations, consultancies) who were considered relevant agents for the rescaling of institutional rationalities. At both scales, we consciously got back to actors who initially refused to do an interview due to a lacking engagement with residential storage systems. Thereby, we aimed at finding mechanisms and conditions for an unsuccessful translation of institutional rationalities. All interviews were conducted by phone or videoconferencing between February 2021 and August 2023 and lasted about 60 minutes on average. All but five interviews were recorded and transcribed verbatim. Extensive notes were gathered in the unrecorded ones.

The empirical material was subject to a qualitative content analysis based on a coding scheme that was informed by the theoretical assumptions, but also arising from our empirics (Yin 2014; Siggelkow 2007; Mayring & Fenzl 2019, for exemplary codes see Appendix 4). In order to gain a more granular understanding of the opportunity spaces at the national and EU scale, we asked our interview partners about scalar preconditions favorable for or impeding the diffusion of residential storage systems. Thereby, the thematic categories were inspired by the conceptual discussion, but mainly derived from our empirical material. With national energy regulation being the main barrier as point of departure, we aimed at identifying institutional work practices for shaping opportunity spaces. At this point, the coding scheme was informed by theory-led expectations (Lawrence and Suddaby 2006), while also allowing for case-specific nuances. As regards conditioning factors, we come back to the concept of opportunity spaces and zoom in on the ‘subjective’ stories of individuals, by grasping their change strategies, their perception of opportunities and limitations, intentions and experiences (Grillitsch & Sotarauta 2020). The agency of actors as an emergent property of interacting individuals is hard to identify, but indicated by the extent of influence their institutional work had on changing relevant regulation as well as public discourse, which we assessed through actual decision- and policy-making interventions as well as cross-validated statements about the estimated impact (Sotarauta & Grillitsch 2023).

4 Findings

4.1 Opportunity spaces for change at a national and EU scale

4.1.1 Opportunity space for the diffusion of residential storage systems in Germany

Approximately from 2013, pioneering actors, particularly storage manufacturers and green electricity providers, constructed and exploited a national opportunity space, which had been opened up by various factors. First, relatively high electricity prices and declining feed-in tariffs for solar power led to financial savings when using battery systems for self-consumption. Second, end consumer prices for storage systems were declining due to technical advances in terms of materials, life spans and capacities as well as economies of scale resulting from the growing electric vehicle market. Third, individual autarky and a wish to contribute to the energy transition were compelling motivation for many people, potentially already owning photovoltaics. Eventually, also conventional electricity providers launched business models involving residential storage systems (e.g., E.On Solarcloud).

“In Germany, 80 or 90 percent of all solar roofs are equipped with storage systems. In other countries, there are much fewer [...]. Different factors play a role [...], particularly the regulatory context. For example, in Germany there were low feed-in tariffs for a relatively long time.” (Interview 36, EU-level industry association)

This resulted in a very dynamic market characterized by rising sales figures. The time-specific opportunity space has been broadened by an emerging energy crisis, which fosters the desire for autarky, and the growing relevance of e-mobility leading to further opportunities, for instance, increasing the share of self-consumption. Both automobile and electricity sector actors widened the opportunity

space by sharing a common storyline of a prosumer-driven decentral electricity provision, with the market for residential storages benefitting from the high media presence of batteries in the context of e-mobility.

However, the national opportunity space is constrained by various factors, such as a delayed smart-meter rollout, which is indispensable for digitally transmitting meter data. Furthermore, governmental authorities (Federal Grid Agency, BNetzA, and the Ministry of Economic affairs and Climate action, BMWK)³ and DSOs are stated to partly promote the logic of a rather traditional central energy supply (large scale electricity generation and storages, full feed-in of PV-electricity). In this context, advocates of residential storage systems (e.g., industry associations, storage manufacturers and electricity providers) regard German energy regulation (mainly the Renewable Energy Sources Act, Erneuerbare-Energien-Gesetz, EEG, and the Energy Industry Act, Energiewirtschaftsgesetz, EnWG) as key barrier. Whereas the German legal environment allows for an enhanced self-consumption share through storages, fees and charges, very complex metering requirements and grid connection procedures (still) hampered the economically feasible realization of further business models. This applies, for example, to energy communities involving energy sharing and the participation in the electricity market as well as to energy concepts in rental properties, which, by contrast, is feasible in other European countries (see Appendix 5, Zademach & Käsbohrer 2022).

The amendments of EEG and EnWG between 2021 and 2023 (see again Appendix 5) allow for including institutional change, thus, shaping the national opportunity space. Since EU legislation needs to be integrated in these acts, the national opportunity space is highly dependent on the EU-level opportunity space, which is presented below.

4.1.2 Opportunity space for the diffusion of residential storage systems at EU level

The EU agenda setting, decision-making and legislation is commonly agreed on being characterized by a multi-level governance logic.⁴ This means, member states share power in producing and implementing legislation mainly with the Commission, Council and Parliament⁵ (EU 2024a, 2024b; Appendix 6 describes the main decision-making institutions in more detail). In the field of energy, most legislation

³ As regards amending the central policies, the German federal parliament is in formal decision-making power over energy policy. The BMWK is in charge of substantively developing the legislation. However, although being intended as downstream, executive authority, considerable power over legislation also lies with the BNetzA providing extensive advisory services to the ministry, and even developing draft laws on their own account due to a high level of personal commitment.

⁴ The EU governance system is commonly referred to as multilevel governance logic, although specific levels of action might reflect different logics. For instance, concerning the European Council and the Council of Ministers, the logic of action tends towards being intergovernmental, whereas in the Commission, the Parliament and the Court, a more supranational logic is prevalent (Bache 2012; Jordan 2001; Hooghe & Marks 2001; Marks et al. 1996). Multilevel governance means the dispersion of authority (understood as the competence and legitimation to make binding decisions) across scales, i.e. to self-ruled regional jurisdictions as well as to supranational institutions (Hooghe & Marks 2021, 2023; Hooghe & Marks 2001).

⁵ In order to adopt EU legislation, inter-institutional negotiations have become standard practice, which generally take the form of tripartite meetings ('trilogues') between the Parliament, Council and Commission. Based on proposals submitted by the Commission, the Parliament and Council adopt their positions and designate negotiators (such as the rapporteur for the Parliament or representatives of the Council's presidency). In the trilogues, the Parliament and Council debate, while the Commission acts as a mediator facilitating an agreement between the co-legislators. Any provisional agreement reached in trilogues is informal and needs to be approved in the Council and mostly also in the Parliament (except for special legislative procedures, see also Appendix 6). The European Council is a further part of agenda setting with respect to the EU's overall direction and political priorities (EP 2024; EUCO & CoM 2024; EU 2024a, 2024b).

is by directive⁶, which sets out binding targets, but allows for leeway in enforcing these goals, i.e. individual countries are instructed to devise their own legislation and measures in order to reach the targets (Hooghe & Marks 2023; EU 2024c). As regards the EU-specific opportunity space for residential storages, the most relevant EU directives are the ‘Renewable Energy Directive’ and the ‘Directive on common rules for the internal market for electricity’, commonly referred to as ‘Electricity Market Directive’ (European Commission 2024b, 2024c; Directive 2023/2413; Directive 2019/944). In addition, residential storage systems are touched upon in the ‘Energy Efficiency Directive’ and the ‘Energy Performance of Buildings Directive’, and in the ‘Commission Recommendation⁷ on Energy Storage’ of 2023 (Directive 2023/1791; Directive 2010/31/EU; Recommendation 2023/C 103/01).

The Renewable Energy Directive and the Electricity Market Directive are concerned with rules facilitating self-consumption and energy communities claiming, for instance, a distinct legal role for energy storages and the abolishment of double fees and charges, of bureaucratic barriers and inadequate measurement requirements (see Appendix 7 for a more detailed description of contents). However, there are diverging perceptions about the legislation’s impact on opening up an opportunity space. Whereas both EU-level (e.g., Commission representatives) and national actors promoting home storages (industry associations, companies) welcome the directionality of EU legislation, national authority representatives, but also EU-level industry associations and consultancies, rather allege the directives’ leeway in implementing, the missing level of detail in legislation on residential storages, and the Commission’s lack of manpower for revising the legislation. A ministry representative even points to contradicting pieces of legislation regarding grid fees or the legal definition of energy storage.

As regards discourses and narratives, EU-level interviewees emphasize high attention for and legitimacy of prosuming and storing energy. Especially energy communities are considered a prominent theme (which potentially, but not necessarily can be complemented by storage systems). Nonetheless, respondents regard residential storages rather a niche due to their little prominence in legislation, the high prices of home storages, and the small market and installed capacities at a European level. Furthermore, the interviewed NGOs emphasize the target of material sufficiency for reducing raw material consumption. The Commission and Parliament underline the policies’ technology neutrality. Hence, interviewees highlight the focus on EV batteries and bidirectional charging, hydrogen applications and larger-scale storage projects stabilizing grids.

Moreover, the EU opportunity space is characterized by semi-coherent institutional rationalities due to spatial variation (Fünfschilling & Binz 2018). That means that member states’ positions and targets, in other words, national opportunity spaces, vary a lot based on differences in electricity generation (rather competitively or monopolistically organized), energy mixes (e.g., share of renewables), differences in grid structures (ownership, number of DSOs) and buildings stocks (suitable for PVs), in business models, and regarding the relevance of electrifying transport and heating. These differences are reflected in member states’ regulation, which results in abstract EU targets and policies:

“EU legislation is too abstract to really include such specific technical solutions, which is a challenge. [...] That’s why an EU directive on batteries wouldn’t work at all, because you would have to intervene too heavily in a country, so there is often no real common denominator when it comes to residential storages.” (Interview 36, EU-level industry association)

The ‘Renewable Energy Directive’ was revised at the end of 2023; the ‘Electricity Market Directive’ is going to be amended in 2024, which allows for institutional changes. The following chapters shed

⁶ Different types of legal acts have to be differentiated, which are binding or not, affecting all EU countries or just a few (regulations, directives, decisions, recommendations, opinions) (EU 2024c).

⁷ “A “recommendation” is not binding. A recommendation allows the institutions to make their views known and to suggest a line of action without imposing any legal obligation on those to whom it is addressed.” (EU 2024c)

light on the arguments and activities of different actor types in rescaling institutional rationalities, focusing on the translation of a decentral, prosumer-driven logic from the EU level towards Germany (4.2.1) and efforts to foster a stronger role of residential storage systems at an EU level (4.2.2).

4.2 Institutional work for structuring opportunity spaces

4.2.1 Translating the decentral energy provision from the EU level towards Germany

The translation of a decentral, prosumer-driven logic mainly refers to EU legislation, which needs to be transposed to the member states' level (Fig. 2). The main agents engaging in institutional work at a national scale are German industry associations, whose members range from electric utilities, DSOs, storage manufacturers to automobile companies. These industry associations often collaborate in *normative networks* with other associations, law firms, research institutions, and companies. Their *political advocacy* mainly addresses ministries, the German Parliament, the German Federal Council, and the BNetzA, for instance, by means of press releases, position papers about draft laws or associations' hearings. In addition to criticizing the high complexity in regulation and, thus, unfavorable conditions for SMEs, a very salient argument is the inconsistent implementation of EU legislation. Industry associations and companies accuse governmental authorities of deliberately circumventing EU legislation, arguing that many amendments (e.g., abolishing high measurement requirements, bureaucratic barriers and double grid fees, taxes and surcharges associated with self-consumption and multi-use applications) required by binding EU targets have been delayed or not implemented at all.

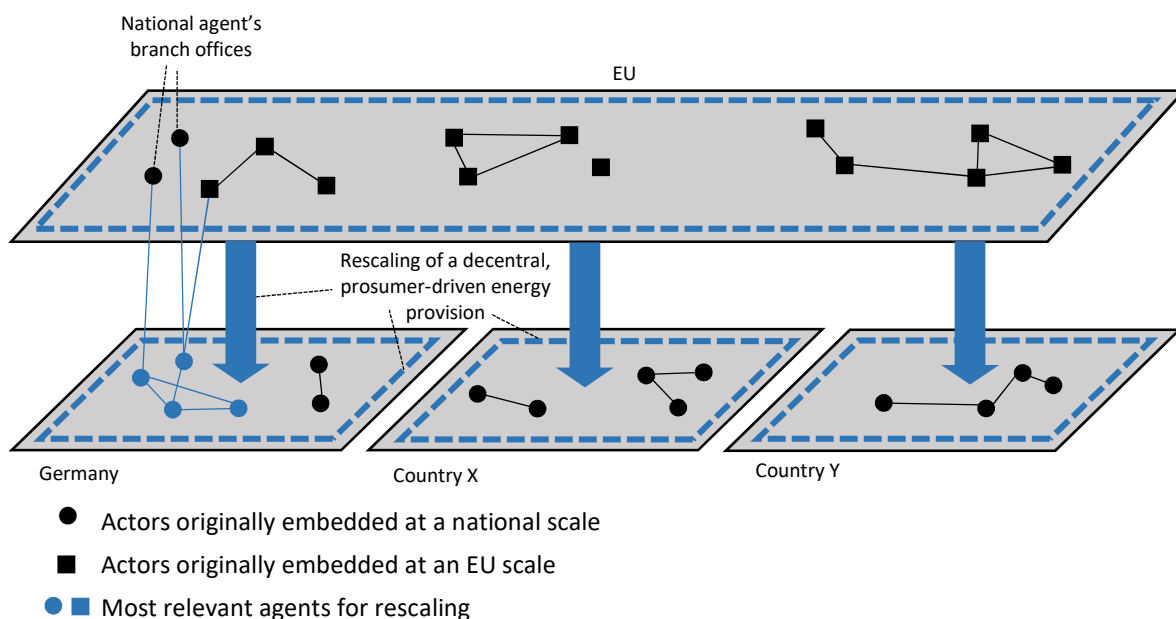


Figure 2: The translation of a decentral prosumer-driven logic from the EU level towards the German scale.

Furthermore, industry associations *educate* their members about German and EU level legislation and potential effects on business models, so to say, on the national opportunity space. Monitoring EU legislation is facilitated given that German industry associations increasingly engage at the EU level, by means of memberships in EU level associations or own branch offices. The same applies to (mostly big) companies, for instance, electricity providers, which maintain representative offices in Brussels. EU-level stakeholders, such as industry associations, consultancies, or NGOs, are usually not directly engaged in an influential manner with national actors in transposing EU legislation into national regulation (see again Fig. 2).

Amendments of EnWG and EEG between 2021 and 2023 resulted in changes in line with EU regulation broadening the opportunity space for a more profitable implementation of business models.

Among others, in 2021, the threshold for exemptions from fees and surcharges was raised from a storage capacity of 10 kWh to 30 kWh, in 2023, the EEG surcharge was completely suspended. However, for instance, energy communities and grid services such as frequency containment reserve are still subject to complex bureaucratic and measuring requirements (see again Appendix 5).

There are divergent perspectives on the role of EU legislation along with institutional work in inducing these changes. Some interviewees, mostly industry associations, but also companies, attribute the beneficial amendments to institutional work emphasizing inconsistencies with EU legislation.

“The EU directive prescribes 30 kw. We had to fight hard for the BMWi to simply implement this requirement one-to-one in the EEG. [...] This happened, just because they have realized that there will be endless complaints [by the EU]. [...] But not because they are convinced of it.” (Interview 11, German electricity provider)

By contrast, particularly governmental authorities highlight the lack of detail in EU legislation on residential storages. Other sector experts (e.g., industry associations) hold the high complexity of German regulation and the delayed introduction of digitally communicating smart meters also responsible for the unused potential of storages systems. While acknowledging the impact of institutional work, some interviewees attribute amendments in 2022 and 2023 (e.g., the suspension of the EEG-surcharge) to a newly introduced government at the end of 2021.

4.2.2 Translating residential storage systems from Germany towards the EU level

The promotion of residential storage systems at an EU level is particularly reached by spreading the narrative around the technology and by influencing legislative initiatives (Fig. 3). As stated throughout all interviews, institutional work mainly targets the Commission and Parliament. Addressing the Council is regarded as being rather difficult due to the lack of public stakeholder consultations for legislative amendments and its composition of national ministries’ representatives.

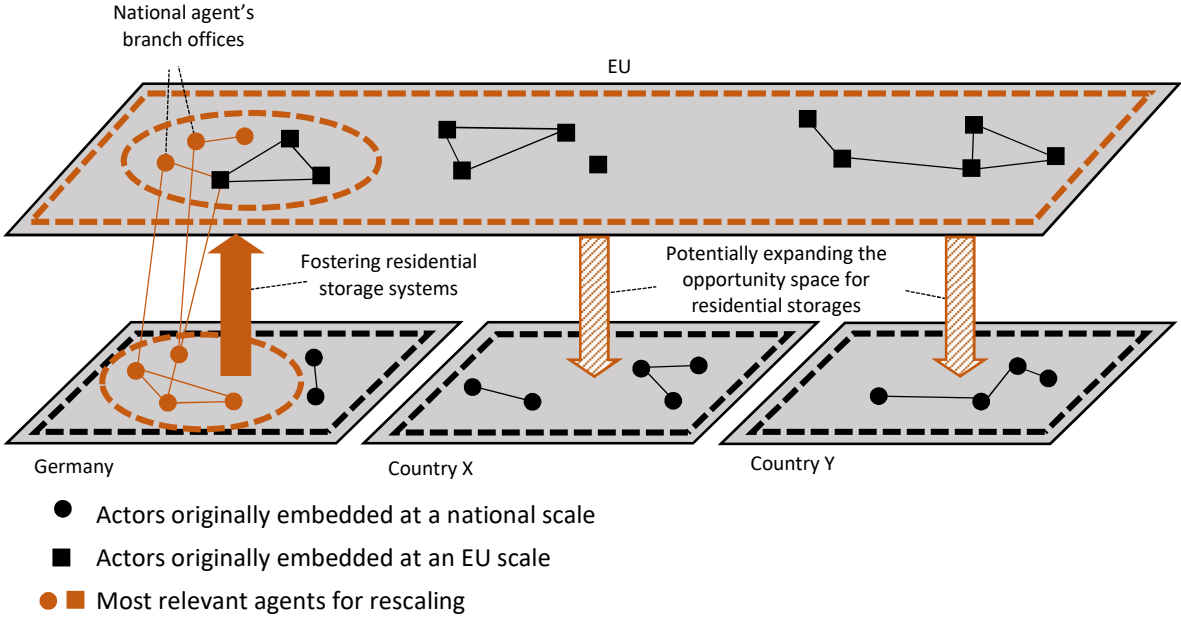


Figure 3: The translation of rationalities around residential storage systems from Germany towards the EU level.

EU-level industry associations related to the electricity system (e.g., promoting storage technologies, solar or wind energy) carry out political *advocacy* targeting EU institutions and *educate* about regulatory barriers as well as the relevance of storage technologies. Since these EU-level associations

pool national members (mostly associations and companies), they aim at translating EU legislation towards their members and developing political positions based on their members' opinions. As for residential storage systems, however, our empirical material indicates a rather abstract level of argumentation, with the associations emphasizing technology neutrality, the diversity of technologies and market segments covered and differences in member states' preconditions.

„We need to tailor so much, because there's still big challenges in the context of taxation, of support schemes, of grid fees, grid connections or permitting. So, usually, it's very rare that we do our lobbying activities explicitly for behind-the-meter [applications for end consumers], usually it goes hand in hand with something else.” (Interview 35, EU-level industry association)

NGOs engaged in institutional work rather foster a reduction of energy consumption or pledge for integrating electric vehicle batteries into households' energy management systems in order to constrain resource extraction.

This encourages German stakeholders to engage in institutional work at EU level on their own account. Through the aforementioned branch offices and representations in Brussels, but also in targeted working groups or by hiring consultancies, mainly national industry associations and companies carry out advocacy work targeting EU institutions (primarily Parliament and Commission). Collaborating in *normative networks* with other associations or competitors, they, for example, release position papers or participate in workshops or stakeholder consultations in the course of legislative initiatives. Thereby, they spread the narrative of residential storages being a solution for grid issues in light of increasingly integrated renewables (see 3.1). In this context, they *educate* about technical specificities and advantages of home storages, in order to *change prevailing associations* with the technology. Furthermore, they point to regulatory requirements for further business models

„Of course, creating ideas and visions about storages, particularly large storages, short-term storages, being essentially important for the systems, for providing grid services.” (Interview 38, German industry association)

The aim is to induce institutional changes benefitting the market for residential storages systems and, thus, to widen the national opportunity space from a future-oriented perspective, since EU legislation needs to be transposed to the national scale. In addition, our empirical material points to efforts to expand the opportunity space to a broader spatial scale (see again Fig. 3). A German industry association representative argues that their national members need to be educated about member states' regulatory frames for expanding their business activities. Furthermore, interviewees emphasize the relevance of *policing*, especially setting standards for metering and communication. A German initiative is stated to promote a communication standard at EU level, which facilitates demand side flexibility by connecting electrical loads (storages, heat pumps, electric vehicles etc.) and producers (photovoltaics) in households' energy management systems. The standard is criticized for forcing competitors to adopt it instead of providing interoperability. Members of this initiative are device manufactures, also offering residential storages:

„They are very aggressive [...] in pushing this standard. They are quite good in their PR. They are all over the policy landscape. [...] They managed to basically take over a European standardization group where they pretend to be developing the standard, but actually [...] it's behind closed doors with their members.” (Interview 39, EU-level NGO)

Concerning the outcome of institutional work, agents at both scales consider efforts of German industry associations and larger companies at EU scale as increasing and highly legitimized. As regards recent legislative amendments, the role of residential storage systems is regarded as rather stagnating (especially) by EU level actors, with the exception of standards for metering and data communication. For example, Article 20a on system integration of renewable electricity in the Renewable Energy Directive amended at the end of 2023 is concerned with facilitating real-time data transfer between batteries, battery owners and third parties, such as electricity market participants, and demands an enabling national regulatory framework therefore (Directive 2023/24133).

Since agents are embedded in opportunity spaces, context-specific structures condition how these actors construct, perceive, and exploit opportunities, which we elaborate on in the following.

4.3 Conditions enabling or constraining the shaping of opportunity spaces

4.3.1 Structuring the opportunity space at the national level

EU-level stakeholders, such as associations, NGOs or consultancies, struggle to get directly involved in structuring the national opportunity spaces, by, for instance, reaching out to national ministries. A first constraining factor lies in often very detailed national regulations and, thus, the lack of knowledge or capacity to get familiar with it. A potential further hindering aspect for direct engagement is the language barrier. Besides, EU level agents often perceive their possibilities to influence national scale institutions to be rather limited. Based on past experiences, interviewees state that they expect to encounter reservations, being accused of imposition or not being taken seriously by, for instance, national ministries. The latter is reinforced by a lacking consciousness about EU decision-making power at the national level and, according to interview statements, the Commission occupying much time for overseeing the implementation of EU-legislation and imposing infringement procedures, especially regarding a niche market such as residential storages.

“Compared to others, we are more strongly engaged in reaching out to ministries in collaboration with national associations [...] and that’s a challenge, since we are not perceived as a domestic actor [...] The people working in these [EU level] lobby associations are sometimes simply too tied to working traditions. That’s why they don’t do it, they don’t really believe in it. [...] The EU is definitely perceived as hostile in the ministries.” (Interview 36, EU-level industry association)

National agents are also constrained in transposing EU legislation into the national context. EU level actors and representatives of authorities emphasize the huge number and high level of detail in EU dossiers affecting various authorities. Thus, the implementation is hampered by the required capacity and coordination work.

4.3.2 Structuring the opportunity space at EU level

Our empirical material suggests that institutional semi-coherence due to spatial variation in member states constrains the EU-level opportunity space for residential storages. First, EU legislation is considered to lack detail (4.1.2). Second, agents embedded at an EU level, such as industry associations, struggle to find common positions and, instead, focus on rather abstract targets (4.2.2).

“A further challenge lies in the very diverse markets, also regarding business models. [...] What works better are higher level goals, such as shifting a certain percentage of electricity demand [...] and every country can find a way to make this possible.” (Interview 36, EU-level industry association)

Hence, national agents see potential for and the relevance of shaping the national opportunity space by engaging at an EU scale on their own account. There are further encouraging conditions: First, even though contradicting to statements by EU level agents, many national interviewees expect a positive narrative around the need and potential of residential storages prevailing at EU level. Second, some actors regard the legislative procedures at EU scale as being more transparent compared to Germany, which is reinforced by, for instance, publicly accessible amendment proposals, by the possibility to take part in committee meetings via videoconferencing or by transparency registers, which document lobbying activities reaching the Parliament and Commission. Third, standardization (e.g., communication interfaces for connecting different devices in private energy management systems) is considered an issue to be treated at a supranational scale. Finally, some interviewees see their potential influence backed by the size of Germany as member state.

Similarly to structuring the national opportunity space, lacking knowledge about EU legislative processes constrains national agents (particularly smaller organizations or companies) in structuring the

EU-level opportunity space. Potentially, this entails a missing consciousness about the impact of EU legislation on the national scales (4.3.1).

In the light of complex regulation at both scales, being embedded at both scales widens actors' possibilities to influence institutions. For example, multi-scalarly organized associations or electricity providers maintaining offices in Brussels are attributed high agency, as they have expertise on the legal environment, access to decision-making as well as legitimacy at both scales. Moreover, with respect to the EU level, sharing nationalities helps to legitimize and get access to members of Parliament (MEPs) and even the Council. Figure 4 provides an overview of all findings.

“So they [national associations] might have easier access to their permanent representatives or to their MEPs than we do. Generally, we invite them to come with us, whenever we are meeting with somebody from their countries. [...] It helps us legitimize a little bit more, not just the big guys in the EU in Brussels.” (Interview 37, EU-level industry association)

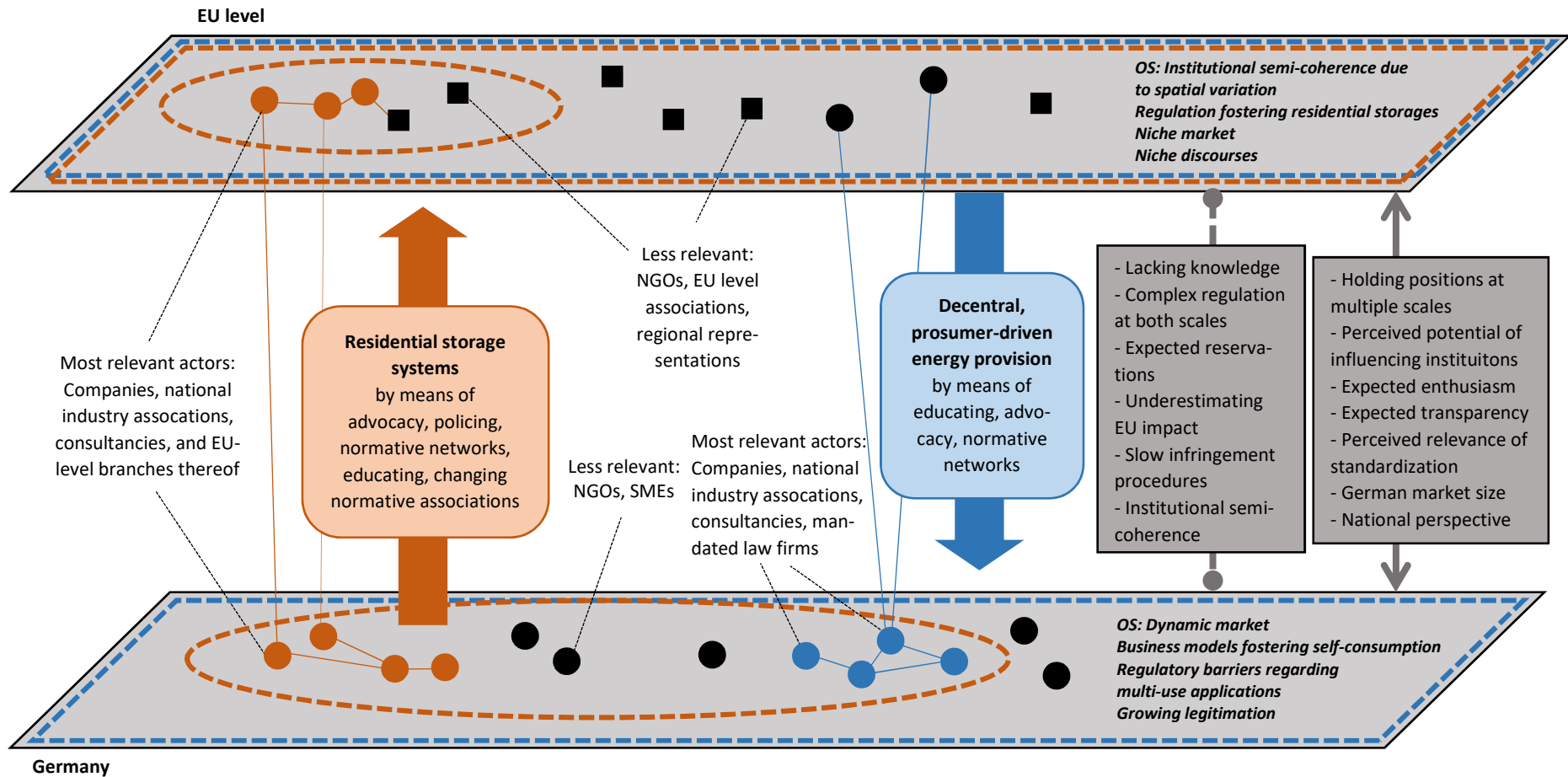


Figure 4: Overview of findings (own elaboration).

5 Discussion

5.1 Combining multi-scalarity in transitions and opportunity spaces for change

We emphasized the concept of opportunity spaces for change, in order to better understand why, how and with what outcomes agents aim at inducing institutional change across scales during transitions. We consider this complement to provide analytical leverage in two respects: regarding the conceptual links between structure and agency and the past and the future.

As shown for urban (Roedke et al. 2022) and regional preconditions (Roessler et al. 2024; Kurrika et al. 2023), we find opportunity spaces to be stratified by a multi-scalar institutional architecture. The interplay of institutional layers including the associated scalar barriers and opportunities for change structure opportunity spaces for renewable energy trajectories in terms of regulation, standards or discourses. The rescaling of such institutional rationalities between layers shapes opportunity spaces. Thereby, agency is conditioned by the scalar structures themselves. Whereas, for instance, institutional semi-coherence is found to constrain efforts to influence legislative amendments, the perceived relevance of legislation and standardization at a broader spatial scale encourages agents to engage in institutional work. Thereby, tying in with Kurrika et al. (2023), our results show how the perceived potential to transform opportunity spaces is shaped by experiences and past encounters as well as future prospects. Agents embedded at the EU scale do not expect having a high impact at the national level due to the ‘convention’ of keeping the layers separate, which also stems from facing reservations in the past. By contrast, national actors anticipate broadening their national opportunity space by influencing EU legislation, which is to be transposed to the national scale in the future.

Furthermore, our conceptual framework allows for integrating inter-scale relations into the literature on opportunity spaces and regional development, as claimed by Grillitsch and Sotarauta (2020). We consider this a fruitful complement, since the path development of the market for residential storage systems in Germany cannot be traced without taking account of the causal power played out at the EU scale (Sotarauta & Grillitsch 2023). Our study shows how actors deliberately make use of institutional properties at this supranational level, when seeking opportunities to strengthen or even spatially expand an industrial development path.

5.2 The influence of holding positions at multiple scales

As regards scalar structures conditioning agency, we found holding positions at multiple scales, such as associations’ branch offices and corporate representations, as facilitating actors to shape scalarly stratified opportunity spaces. This corresponds to Grillitsch (2015), who reveals that agents, being subject to two or more institutional layers, are able to mediate interests, translate behaviour and facilitate knowledge transfer between layers. Thereby, trust-based networks and knowledge exchange are fostered by institutional proximity (Grillitsch 2019; 2015). Speaking of structuring opportunity spaces, Grillitsch and Sotarauta (2020) consider the agent-specific opportunity space to be strongly related to individual networks and positions in society, since moving between positions in different respects, ranging from profession, education, sector, social embedding or location, shapes individual experiences and encourages actors to recognize opportunities. Our results confirm the relevance of networks at multiple layers. Agents embedded at both scales (companies or multi-scalarly organized associations) are attributed high agency due to easier access to decision-making, to knowledge (e.g., on regulation at both scales) and knowledge exchange, as well as legitimacy in the sense of being accepted for establishing networks also across scales. Furthermore, these agents act more independently of mind barriers such as expected reservations or an underestimated relevance of EU targets and policies.

5.3 The role of institutional semi-coherence

Our results unveil a rather counterintuitive role of institutional semi-coherence. In transition literature, institutional semi-coherence is considered to trigger transitions, since the mimetic pressure evoked by the dominant regime is restricted and less institutional work is needed to institutionalize alternatives challenging a regime. The translation of institutional rationalities enhances institutional semi-coherence, which, in turn, legitimizes further institutional work, since inherent conflicts and contradictions broaden the scope of legitimate agency (Miörner & Binz 2021; Fünfschilling & Binz 2018; Fünfschilling & Truffer 2014). In our case, however, institutional semi-coherence rather constrains the rescaling of institutional rationalities and, thus, the diffusion of niches towards a broader spatial scale. First, favourable institutions (e.g., policy targets, legislation) remain abstract instead of accelerating diffusion. Second, institutional work activities of agents embedded in institutional semi-coherence (e.g., EU level industry associations) lack common objectives and, instead, are directed at higher-level targets fitting the different preconditions. As regards our study, this hinders national actors from collaborating with EU-level agents.

5.4 Opportunity spaces emphasize a relational perspective on scales

This case study allows for reference to geographic theorizing about scales (Binz et al. 2020; Hansen & Coenen 2015; Murphy 2015). Scale is conceptualized as continuously produced, contested and restructured by actors, instead of being a fixed, ontologically given container associated with inherent characteristics and a specific size or level, such as ‘the region’ or ‘the nation’ (Swyngedouw 2004; 1997). Since actors then establish, differentiate, hierarchize and reorganize multi-level spatiality, scalar transformations have to be approached relationally stressing mutual formative interactions (Brenner 2001; Howitt 1993). Thus, scales and scalar arrangements are understood as the outcome of social and political contestation taking place between actors (Swyngedouw 2004; 1997). In this context, MacKinnon (2010) considers scale as a dimension of strategic agency aiming at influencing both discursive and material aspects in order to privilege scales over others and, thus, exert influence and control over specific areas of societal life and public policy.

Our results reflect this relational approach in two regards. First, agents aim at rescaling and, thus, spreading beneficial institutions, when shaping their national opportunity space. Thus, they strengthen the importance of institutional layers, even though there might not be any shifting of decision-making power (Madsen 2022). Thereby, linking to MacKinnon (2010), they carry out institutional work activities, which aim at affecting both discourses and the material production of scale (narratives, technical standards). As a consequence, second, we observe mutually formative interactions, as we cannot understand the national opportunity space without taking the necessary implementation of EU legislation into account. This ties in with Kurrika et al. (2023), who argue that region-specific opportunity spaces are highly dependent on exogenous, global opportunity spaces. However, we observe a bidirectional interrelationship, since the rescaling of national institutional layers influences the opportunity space at a broader spatial scale, for instance, by leading to institutional semi-coherence due to spatial variation.

6 Conclusion

This study sheds light on why, how and with what outcomes actors engage in multi-scalar institutional change processes during transitions. We show how actors rescale institutional rationalities by carrying out institutional work across scales with the intention to promote a niche in the field of renewable energy. By integrating the concept of opportunity spaces for change, we conceptualize the multi-scalar institutional architecture as structure for agency and take account of the future-past-dimension of agency. The market for residential storage systems in Germany serves as empirical case.

In light of regulatory barriers for advancing business models, particularly national industry associations and companies aim at shaping the national opportunity space by advocating a thorough implementation of EU legislation benefitting this renewable energy niche. The future-oriented dimension of agency manifests itself in institutional work at a European scale, in spreading the narrative around residential storages, influencing legislative amendments and setting standards regarding metering and communication. By contrast, agents embedded at a European scale, for example, industry associations or NGOs, are constrained by scalar structures, such as institutional semi-coherence due to pooling national differences in regulations or targets or past experiences of reservations at a national scale. In general, very detailed regulation at both scales hampers rescaling processes. Thus, being embedded at both scales, for instance, by means of corporate representations, is associated with high agency due to expertise on the legal environment, access to decision-making as well as legitimacy at both scales.

This bottom-up perspective on agency allows to deep-dive into institutional change processes and unveils how and why actors contribute to transforming opportunity spaces in the context of energy transitions, given the (perceived) engagement possibilities and (anticipated) outcomes across scales. As discussed, a limitation of this case study lies in establishing causality between institutional work and institutional change, with, for instance, a newly introduced government or the delayed introduction of smart meters rivaling institutional work activities. Thus, this conceptual framework would benefit from further studies, focusing on other institutional architectures (on a local or global scale), and sectors with a less pronounced national anchoring of institutions.

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Appendices

Appendix 1

Definitions of forms of institutional work and constituent elements required for different forms of institutional work. (R = resources; D = discourses; N = networks)

Institutional work	Definition
Creating institutions	
Advocacy	The mobilization of political and regulatory support through direct and deliberate techniques of social suasion
Defining	The construction of rule systems that confer status or identity, define boundaries of membership or create status hierarchies
Vesting	The creation of rule structures that confer property rights
Constructing identities	Defining the relationship between an actor and the field in which that actor operates
Changing normative associations	Remaking the connections between sets of practices and the moral and cultural foundations for those practices
Constructing normative networks	Constructing of inter-organizational connections through which practices become normatively sanctioned and which form the relevant peer-group with respect to compliance, monitoring and evaluation
Mimicry	Associating new practices with existing sets of taken-for-granted practices, technologies and rules in order to ease adoption
Theorizing	The development and specification of abstract categories and the elaboration of chains of cause and effect
Educating	The education of actors in skills and knowledge necessary to support the new institution
Maintaining institutions	
Enabling work	The creation of rules that facilitate, supplement and support institutions, such as the creation of authorizing agents or diverting resources
Policing	Ensuring compliance through enforcement, auditing and monitoring
Deterring	Establishing coercive barriers to institutional change
Valorizing and demonizing	Providing for public discourse positive and negative examples that illustrate the normative foundations of an institution
Mythologizing	Preserving the normative underpinnings of an institution by creating and sustaining myths regarding its history
Embedding and routinizing	Actively infusing the normative foundations of an institution into the participants' day to day routines and organizational practices
Disrupting institutions	
Disconnecting sanctions	Working through state apparatus to disconnect rewards and sanctions from some sets of practices, technologies or rules

Disassociating moral foundations	Disassociating the practices, technologies or rules from its moral foundation within a specific cultural context
Undermining assumptions and beliefs	Decreasing the perception of risks of innovation by undermining core assumptions and beliefs

Source: Lawrence and Suddaby (2006).

Appendix 2

Overview of working group meetings of industry association, participant observation

No.	Topic	Date
1	Energy law working group	Sep 2020
2	Energy politics working group	Sep 2020
3	Task force for EEG amendment	Sep 2020
4	Energy politics working group (presentation by member of EU parliament)	Sep 2020
5	Working group on residential storage systems	Oct 2020
6	Finance and Investments working group	Oct 2020
7	Workshop: Residential storage systems	Nov 2020
8	Storage technologies working group	Nov 2020
9	Standards and quality criteria working group	Nov 2020
10	Trade fair about battery storage systems	Nov 2020
11	Energy law working group	Dec 2020
12	Working group on residential storage systems	Dec 2020
13	Task Force for EnWG amendment	Jan 2021
14	Energy law working group	Feb 2021
15	Working group on residential storage systems	Feb 2021
16	Trade fair on residential and industry storage systems	Mar 2021
17	International market developments working group	Mar 2021
18	Energy law working group	Apr 2021
19	Energy politics working group	Apr 2021
20	International market development working group	Apr 2021
21	Workshop: Storage systems and manufacturing industry	Apr 2021
22	Storage technologies working group	May 2021
23	Energy law working group	May 2021
24	Working group on residential storage systems	Jun 2021
25	Task force Smart Meter Gateway	Jul 2021
26	Energy politics working group	Sep 2021
27	Energy law working group	Oct 2021
28	Energy law working group	Nov 2021
29	Storage technologies working group	Feb 2022
30	Energy law working group	Feb 2022
31	Energy law working group	Apr 2022
32	Working group on residential storage systems	May 2022
33	Workshop: Regulation of fast charging	Jun 2022
34	Energy law working group	Sep 2022
35	Storage technologies working group	Sep 2022
36	Working group on residential storage systems	Sep 2022
37	Mobility working group	Sep 2022
38	Task force on §14a EnWG	Oct 2022

39	Energy law working group	Nov 2022
40	Task force residential storage systems	Jan 2023
41	Working group on residential storage systems	Feb 2023
42	Mobility working group	Feb 2023

Appendix 3

Overview of interviews

No.	Interviewee	Date
1	Industry association representative (energy sector)	Feb 2021
2	Company for energy management systems, telecommunications: CSO, Consultant	Feb 2021
3	Chamber of Commerce and Industry representative	Feb 2021
4	Private research institute representative	Feb 2021
5	Company for energy management systems, storage systems: Head of business development	Mar 2021
6	Private research institute: Executive director	Mar 2021
7	Storage manufacturer representative: In-house lawyer	Mar 2021
8	Energy utility representative: Product manager	April 2021
9	Chancery for energy law: Lawyer	May 2021
10	Energy utility representative	May 2021
11	Energy utility representative: In-house lawyer	May 2021
12	Chancery for energy law: lawyer	May 2021
13	Distribution grid operator representative	May 2021
14	Federal Network Agency representative	Jun 2021
15	Industry association representative (electrical industry)	Jun 2021
16	Industry association representative (electrical industry)	Jun 2021
17	State Network Agency representative	Jul 2021
18	Researcher (E-mobility)	Jul 2021
19	Municipal grid operator representative	Jul 2021
20	Ministry for Economic Affairs and Climate Action: Civil servant	Jul 2021
21	State Network Agency representative	Jul 2021
22	Transmission grid operator representative	Sept 2021
23	Researcher (energy sector)	May 2022
24	Storage manufacturer representative: In-house lawyer	Jul 2022
25	Energy utility: In-house lawyer	Jul 2022
26	Industry association executive director (E-mobility)	Sept 2022
27	Industry association executive director (energy sector)	Sept 2022
28	Industry association representative (automotive industry)	Sept 2022
29	Automotive supplier representative	Jan 2023
30	Storage manufacturer representative: expert for e-mobility and energy management systems	Mar 2023
31	Storage manufacturer representative: CEO	April 2023
32	Accredited Parliamentary Assistant at European Parliament	April 2023
33	Energy utility: representative at EU level	April 2023
34	EU-level industry association representative (energy sector); former EU-level consultancy representative	April 2023
35	EU-level industry association representative (energy sector)	April 2023
36	EU-level industry association representative (energy sector)	April 2023

37	EU-level industry association representative (energy sector)	April 2023
38	Industry association representative (energy sector)	May 2023
39	EU-level NGO representative (standardization)	Jun 2023
40	EU-level NGO representative (environment, sustainability)	Jul 2023
41	EU-level consultancy representative	Aug 2023
42	Ministry for Economic Affairs and Climate Action: Civil servant	Nov 2023
43	EU Commission General Directorate	Nov 2023

Appendix 4

Exemplary empirical material for opportunity spaces (4.1), institutional work (4.2) and conditioning factors (4.3) for the national and EU scale from interviews

National scale	EU scale
<p>4.1 <i>“That’s why there is considerable disappointment not only in the storage industry, but among many energy innovators about the implementation, where you can clearly see that someone is really just jumping as high as they have to [...]. Energy communities are simply not implemented, double burdens [with taxes and charges] are simply ignored. This is a pity. There is a disconnect between those who implement the legal framework and those who technically bring it onto the streets. This is a pity.” (Interview 7, German storage manufacturer).</i></p> <p><i>“Regarding the question whether energy sharing can and should be implemented within Europe, there are big differences. In Germany, this doesn’t work at all. But in Portugal and France it already works and is already being done.” (Interview 36, EU-level industry association)</i></p> <p><i>“I believe that the development of residential storages will only go in one direction and that is upwards, I am 100% convinced of that. Batteries are becoming cheaper and the concepts and systems, establishing themselves on the market, are getting better and I believe that this is a very big future segment. Above all, this motivation of the energy transition happening at home is also a very big one. Most home storage owners don’t calculate down to the last cent whether it’s really worth it. [...] They just think it’s nice when they fill up their storage with their self-generated electricity or charge their cell phones every day.” (Interview 42, German Ministry for Economic Affairs)</i></p>	<p><i>“I think the institutions here see it as a really viable way to help with the topic of the renewables since you have periods of overproduction that you can save some of the energy that you are not using in the moment and deploy it later. I think that they see overall in the home storage systems roll-out whether it be through like a battery wall or something that we are promoting quite a bit are batteries on wheels you know through electric vehicles.” (Interview 37, EU-level industry association)</i></p> <p><i>“We think, first of all, the EV is already a form of home storage, so since these batteries are in use anyway, we think this is, where the first focus should be, to actually make sure that those can be integrated in the building and that solar energy can be stored there.” (Interview 39, EU-level NGO)</i></p> <p><i>“At the moment the narrative is more focused on EVs, to other forms of storage, but their [residential storage systems] argument is there, [...] maybe there is a bit too much focus still on centralized systems, so, large storage systems for big renewable generation plants rather than home based solutions.” (Interview 41, EU-level consultancy)</i></p>
<p>4.2 Institutional work:</p> <p><i>“The EU requirements clearly state that storage facilities should not have multiple or double burdens and should not be slowed down by bureaucratic obstacles. This brings us back to a central area that is particularly important to us. With the EU, we have a partner that has passed legislation that provides everything we need to bring storage on a par with energy generation technologies.” (Interview 1, German industry association)</i></p> <p><i>“We have carried out in-depth analyzes of what needs to be implemented in our opinion. [...] we also published the distillate as an article in the Journal for New Energy Law. [...] For people who are interested in implementation, so that they can search for the European template in the EEG and EnWG.” (Interview 7, German storage manufacturer)</i></p> <p><i>“And there is still room for creativity when it comes to implementation. There are many more options there. There is a different need for argumentation, on a different level, so to speak. At the national level, you are much more specific and would break it down to the national, existing framework and then say, for example: “We already have all that, we don’t need to</i></p>	<p>Institutional work:</p> <p><i>“There is usually one large incumbent that they also will have an office here in Brussels and it will be collaboration with the association but there are some things where they have to represent their companies. Specific interests that might not align perfectly with the associations.” (Interview 37, EU-level industry association)</i></p> <p><i>„There are industry associations at the European scale, with which we communicate more closely, since we maintain also memberships. [...] But usually, we also take part directly in consultations in order to bring in a more national perspective.” (Interview 38, German industry association)</i></p> <p><i>“In Brussels, too, the principal topic is informing, because the top people have to understand it in order to be able to transport it downwards.” (Interview 26, German industry association)</i></p> <p><i>„Particularly regarding drafting the products concerning frequency containment reserve, which have been modified over years. We have been taking part in every consultation in</i></p>

implement it anymore." (Interview 25, German electricity provider)

Institutional work outcome:

"The EU is also doing good things, for example the EEG levy on self-consumed electricity. The limit in Germany used to be 10 kW peak. The limit was raised to 30 kW peak thanks to the EU. That wouldn't have happened voluntarily in Germany." (Interview 10, German electricity provider)

"There was also enormous pressure from various companies in the storage industry and they have now been heard more than before. And of course the template from the EU, which states that double burdens must be avoided. [...] And yes, that has now made a hit and the driving forces are clearly the factions in Parliament [...]" (Interview 12, German lawyer)

"[...] regarding the current legal framework, EEG and ENWG. I have to say: what this government [introduced at the end of 2021] has already introduced - in terms of simplifications - we haven't had that in the last 16 years. It's unbelievable how quickly things are suddenly happening and we're actually pretty excited about how this is being discussed at the moment." (Interview 25, German electricity provider)

"The question is whether it is a good strategy to demand that the EU directives are not implemented. I think, the strategy was bad and is bad [...]. You can do that [make use of residential storages], it's just not practical [due to regulatory complexity]. According to energy law it is possible, just not practical." (Interview 38, German industry association)

4.3 Complex national regulation:

"It's a matter of capacity [...] the way things work in Brussels is different compared to the way things work at national level. [...] but we don't have the capacity to also have people covering national level." (Interview 34, EU level consultancy)

Language barrier:

"We generally don't have a lot of access directly, as a secretary we don't have a lot of access directly at the national level, that's usually done through our members. Our members are pretty good at working with their national ministries and connecting us where it's necessary. But it's also sometimes an issue of a language barrier making sure that. [...] We kind of keep it separate between the EU and the national level." (Interview 37, EU-level industry association)

Expecting reservations:

"[...] kind of a common narrative that we hear between the people who work in the Brussels bubble and those that work on national politics that there is a lot of imposition happening from the EU level." (Interview 37, EU-level industry association)

order to argue, that storage systems of all sizes should make a realistic and relevant contribution." (Interview 38, German industry association)

"Eventually, we pursue our interests through the [EU-level] associations and we also pursue our interests individually. [...] [Electricity provider] does not always have to agree with us on every detailed regulation. And it is also very difficult for the associations here to respond to particular interests." (Interview 33, German corporate representation in Brussels)

Institutional work outcome:

"It's clear that the level of presence and interest of companies is really expanding. [...] Companies are giving more strategical importance, and [...] many CEOs, managing directors, important members of companies, are directly involved, and now directly come to Brussels to events to talk with the commission." (Interview 34, EU-level industry association)

"To be fair, we still have two files [...], the energy efficiency directive and the energy performance of building directive, that are being elaborated but again in those documents energy storage's role is not so big, it's there but we think that could be a bit more, to be honest." (Interview 35, EU-level industry association)

"The laws that are currently being negotiated [...] do not contain any central requirements for residential storages. That means that relatively little actually changes. What happens a bit is that in data traffic specifications, such as how a home storage system can be connected to the DSO, there is just a bit of dynamism coming into the matter, i.e. that more standardization is being created." (Interview 36, EU-level industry association)

Institutional semi-coherence:

"We [EU-level industry association] have to compromise quite a bit to reach an inherent position among our members, you know, in Europe, we are representing a 500 utilities it can be difficult sometimes to climb the middle way." (Interview 37, EU-level industry association)

Perceiving the EU scale to be relevant:

"And of course you always have to know what the European level allows. But we also have much better leverage if we think in a European way and that is why it is important to be positioned as a European association." (Interview 9, German lawyer)

"In some cases it [EU-legislation] is even more important than national legislation, because regarding many aspects we experience that new regulations that are now coming from the EU have completely reduced current national legislation to absurdity. So it's important to know what's happening at EU level, and we're also trying to incorporate some steering effects here." (Interview 26, German industry association)

"We are a national association in this respect, but we are increasingly and strongly involved in Europe because it is important of Germany. [...] to accommodate our companies there as well, the entire regulatory system comes from Brussels, we have to get very involved there." (Interview 27, German industry association)

EU's influence underestimated at a national scale:

“So what you can see is that the influence of EU legislation in Germany is still totally underestimated. Many people don't have this on their radar at all, even though a lot has happened. So European regulations and directives on energy issues have only been in place for a few years.” (Interview 12, German lawyer)

Long, inconsistent infringement procedures:

“In the role of guardian of the treaties, the EU Commission certainly has a need to sharpen up the matter because it has really brought very little to court in recent years. I admit that the Commission sometimes turns a blind eye and lets it pass.” (Interview 33, German corporate representation in Brussels)

Complex EU legislation:

„[...] that decisions are made by people who are not actually involved in the national legislative process and that the national legislators are suddenly faced with such a document where they don't actually know exactly what to do with it, what that's all about, and that it simply doesn't fit into the dynamics of national politics.” (Interview 36, EU-level industry association)

“What's coming now with the EU's new electricity market design, you can no longer keep up, it's huge changes, it's become incredibly complicated.” (Interview 42, German Ministry for Economic Affairs)

“Eventually, a very large part of the energy system is predetermined by European guidelines. Sometimes you can only devise things nationally, which is why it is important that the European rules are not only kept in mind, but also to actively contribute to their development.” (Interview 38, German industry association)

Expected enthusiasm:

„Particularly at EU level, in all the debates, in all the regulatory processes, including regulations, there is a lot more vision to be seen, of what should be made possible in the future in order to give a new technology scope for action. [...] I experience that the dialogue with Brussels is significantly more constructive and significantly more visionary than at the federal level.” (Interview 26, German industry association)

Expected transparency:

“So basically you have to say that the European Parliament is very transparent. All documents are published and all amendment requests are accessible. Many committees have an intra-list where you can see exactly which rapporteur is determined and we then know which committee is responsible for the dossier. Then the rapporteur is nominated, the shadow rapporteurs, you can see all of that on the Parliament website. The draft report, you can now also take part electronically. [...] In the Council - you are right - it is less transparent.” (Interview 33, German corporate representation in Brussels)

Perceived relevance of standardization:

“The [dynamic] can be explained by the fact that manufacturers are constantly demanding more harmonization and standardization. [...] That it is implemented at the European level because that would be a huge problem if 27 different solutions were to emerge [...] and at that point [...] they then decide to have an impact on it at the European level.” (Interview 36, EU-level industry association)

Germany's size as member state:

“We are the largest member state, we are the largest payer. And what Germany says obviously has a certain weight in Brussels.” (Interview 27, German industry association)

„Germans are a bit more confident, that they can have their way through things anyway, they can sort things out, yes, maybe that's, I don't know, just attitude. I see that they are a bit more confident, but maybe this also comes from the fact that it is quite obvious that Germany and France are the most influential member states.” (Interview 34, EU-level industry association)

Complex legislative processes:

“The bigger companies have bigger voice, they have membership there, they have an office in Brussels, they know what they are talking about, they have the man power to focus on the issues, small companies maybe don't have the time to focus on european level even

though its driving all the changes even on a national level.” (Interview 34, EU-level consultancy)

National perspective:

“For example, the MEPs actually meet exceptionally often with the companies, some of which even have closer contacts with the MEPs than we. [...] Companies have more opportunities, for example, German companies talk to German MEPs. This national orientation plays a role again.” (Interview 36, EU-level industry association)

Appendix 5

Table 1: Main regulatory barriers in EEG and the respective changes through recent amendments relevant for business models involving residential storages and electric passenger cars (still existing barriers in italics).

Main regulatory barriers in EEG 2017	Main regulatory barriers and changes in EEG 2021	Main regulatory barriers and changes in EEG 2023
<i>Installation of photovoltaics and storage systems highly complex bureaucratically.</i>	Easier grid access for storage systems (§8 Abs. 5 S. 3 EEG).	
Missing definition of ‘energy storage’, instead treatment as consumer and generation facility (§ 3 Nr. 1 EEG).		In 2023, new definition of energy storage as new category besides generation, transport and consumption in EnWG (§3 Abs.15d), not yet in EEG. <i>However, one-year time limit to incorporate definition in main regulatory frameworks.</i>
Threshold for total exemptions of grid fees, taxes and (EEG-) surcharges at 10 kWh (§ 61a Nr. 4 EEG), de-facto double charging with grid fees, taxes and (EEG-) surcharges for installations > 10 kWh in the course of storing and withdrawing electricity from the storage (grid services) due to high and complex measurement requirements (§§ 60, 61l EEG). Regarding EEG-surcharge, in any case 40% each time for storing and withdrawal of electricity (§ 61b EEG).	Threshold for exemptions of grid fees, taxes and surcharges set from 10 kWh to 30 kWh for new and existing installations (§ 61 Abs. 1 EEG). § 61l EEG simplified, grid services involving storing and withdrawing electricity from the storage possible for prosumers without double charging with taxes and (EEG-) surcharges. <i>However, not applied to grid fees and still highly complex in terms of measurement requirements.</i>	Suspension of EEG surcharge (§ 58 EEG). Simplified measurement at grid connection point (behind-the-meter): most fees and taxes only relate to withdrawals from and feed-ins of electricity to the grid, balancing of electricity flows (acc. to §21 EnFG ‘Energiefinanzierungsgesetz’, former § 61l EEG). <i>However, still contested: grid fees and electricity taxes in multi-use applications.</i> Storage losses are exempt from charges and fees (§ 21 EnFG).

Rules on energy communities not implemented. Furthermore, joint production and usage of renewables by self-consumers located in the same building hampered by regulatory and bureaucratic requirements (§ 3 Nr. 19 EEG; §§ 21b Abs. 3, 23b EEG).

Joint production and usage of renewables by self-consumers located in the same building (landlord-to-tenant electricity) facilitated, as electricity can be delivered by a third party instead of the facility operator itself (§ 21 Abs. 3 EEG). Furthermore, higher government subsidies for projects in rental apartments (§ 48 EEG).

Separation of green and conventional grid power as well as self-consumed and fed-in electricity flows, leading to complex metering of different electricity flows and hampering multi-use of storage systems (§ 3, Nr. 1 EEG; § 61 EEG)

Introduction of regulation for pv systems older than 20 years (§ 3 Nr. 3a EEG; § 19 EEG).

New rates of feed-in compensations for prosumers completely and partly feeding in (involving self-consumption) with the latter being reasonably high and, thus, enhancing the installation of a storage system in addition to photovoltaics (§ 100 Abs. 4 EEG).

Source: Erneuerbare-Energien-Gesetz (EEG) in Bundesministerium der Justiz (2023a,b).

Table 2: Main regulatory barriers ENWG and the respective changes through recent amendments relevant for business models involving residential storages and electric passenger cars (still existing barriers in italics).

Main regulatory barriers in EnWG 2011	Main regulatory barriers and changes in EnWG 2021	Main regulatory barriers and changes in EnWG 2022
Missing definition of ‘energy storage’ as well as mobile storages, instead treatment as consumer and generation facility (§ 3, Nr. 15 EnWG).		In 2023, new definition of energy storage as new category besides generation, transport and consumption (§3 Abs.15d EnWG). <i>However, one-year time limit to incorporate definition in main regulatory frameworks.</i>
Double charges with grid fees and charges (§ 19 Abs. 2 EnWG, § 17f Abs. 5 EnWG ‘offshore grid fee’ § 48 EnWG ‘concession fee’), double charges with grid fees (§ 118 Abs. 6 EnWG).	Fees and charges measured analogously to § 61l EEG. <i>However, not applied to grid fees (§ 118 Abs. 6 EnWG).</i>	
<i>No regulation for bidirectional charging, e.g. grid charging periods of private electric vehicles, which also affects residential storage systems (§ 14a EnWG)</i>		<i>(Forthcoming, BNetzA in charge of regulation for grid charging periods allowing DSOs to control storage systems in exceptional cases (§ 14a EnWG))</i>

Source: Energiewirtschaftsgesetz (EnWG) in Bundesministerium der Justiz (2023a,b).

Appendix 6

Table 1: The role of EU institutions for policymaking (EU 2024a, 2024b; European Commission 2024a; EP 2024; EUCO & CoM 2024; Hooghe & Marks 2001)

Institution	Function in policymaking
European Commission	<ul style="list-style-type: none"> ▪ Main executive body, includes Directorate-Generals (departments with specific zones of responsibility) ▪ Policy initiating Enjoys the sole right to initiate and draft legislation In-house knowledge, but also relying upon an extensive advisory system of public and private actors, paid consultants and expert groups (e.g., national government nominees, interest group representatives, trade unions, scientists) for consultation and pre-negotiation ▪ Decision making Role of broker and consensus drafter between Council and Parliament (part of conciliation committee mediating between Parliament and Council) ▪ Implementation Discretion to interpret legislation and issue administrative regulations or decisions Oversees the implementation of its laws and policies and is charged with ensuring that they are respected (together with the Court of Justice) Often committees (subnational or national officials, interest group representative, technical experts, scientists) assisting the Commission in executive work
European Parliament	<ul style="list-style-type: none"> ▪ Autonomous, directly elected Parliament ▪ Policy initiating Enabled to request the Commission to produce proposals ▪ Decision making In ordinary legislative procedures (applies to around 85 policy areas): co-equal right with Council to adopt EU legislation In special legislative procedures: regarding consent procedures (e.g., accession or withdrawal of EU members), right to reject legislation, but not amending it; regarding consultation procedures (e.g., competition law), Parliamentary consultation required for Council to pass legislation Establishing and approving EU budget
Council of the EU / Ministers (CoM) ('the Council')	<ul style="list-style-type: none"> ▪ Represents the governments of EU countries, meeting of national ministers for adopting laws and coordinating policies ▪ Policy initiating Enabled to request the Commission to produce proposals ▪ Decision making In ordinary legislative procedures (applies to around 85 policy areas): co-equal right with Council to adopt EU legislation In special legislative procedures: regarding consent procedures (e.g., accession or withdrawal of EU members), right to adopt legislative proposals after obtaining the consent of the Parliament; regarding consultation procedures (e.g., competition law), right to adopt a legislative proposal after the Parliament has submitted its opinion on it. However, the Council is not legally obliged to take the Parliament's opinion into account.

European Council (EUCO)	<ul style="list-style-type: none">▪ Summit of the heads of state or government of the EU member states (plus the president of the Commission)▪ Policy initiating<ul style="list-style-type: none">Enabled to request the Commission to produce proposalsImmense prestige and legitimacy, quasi-legal status as body defining rather general political guidelines (e.g., on foreign and security policy) than specific policy proposals
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Appendix 7

Table 2: Most relevant EU directives concerned with residential storage systems (European Commission 2024b, 2024c; Directive 2019/944; Directive 2018/2001; Directive 2023/24133)

Act	Overall targets	Most relevant targets regarding residential storage systems
Renewable Energy Directive (Directive 2018/2001)	<ul style="list-style-type: none"> ▪ Development of clean energy across all sectors of the EU economy, supporting cooperation between EU countries towards this goal ▪ Electrification (of cooling, transport, industry, buildings and district heating/cooling), promoting electric vehicles and smart recharging ▪ Overall renewable energy target of at least 42.5% binding at EU level by 2030, but aiming for 45% ▪ Strengthening energy security ▪ Promoting faster and easier permitting procedures for renewables ▪ Allowing citizens to play an active role in the development of renewables by enabling renewable energy communities and self-consumption of renewable energy ▪ Part of Clean energy for all Europeans Package 	<ul style="list-style-type: none"> ▪ Rules on self-consumption <ul style="list-style-type: none"> Art. 21, 1: consumers are entitled to become renewables self-consumers Art. 21, 2: renewables self-consumers, individually or through aggregators, are entitled (1) to generate, consume, store renewable energy and sell their excess production, including through electricity suppliers and peer-to-peer trading arrangements without discriminatory or disproportionate procedures and charges, and to (network) charges, that are not cost-reflective, neither for electricity they consume from or feed into the grid nor for self-generated electricity, (2) to install and operate electricity storage systems combined with installations generating renewables for self-consumption without liability for any double charge, including network charges, for stored electricity remaining with their premises, (3) to maintain their rights and obligations as final consumers, (4) to receive remuneration including support schemes for self-generated renewable electricity they feed into the grid. Art. 21, 3: Member States may apply non-discriminatory and proportionate charges and fees to renewables self-consumers if (a) the self-generated renewable electricity is effectively supported via support schemes, (b) if the total installed electrical capacity of installations is more than 30 kW. Art. 21, 4: Member States shall ensure that renewables self-consumers located in the same building, including multi-apartment blocks, are entitled to engage jointly in activities referred to in paragraph 2 and that they are permitted to arrange sharing of renewable energy that is produced on their site or sites between themselves, without prejudice to the network charges and other relevant charges, fees, levies and taxes applicable to renewables self-consumers. Art. 21, 6: Member States shall put in place an enabling framework to promote and facilitate the development of renewables self-consumption based on an assessment of the existing unjustified barriers to, and of the potential of, renewables self-consumption in their territories and energy networks, including, inter alia, accessibility of renewables self-consumption to all final customers; and addressing unjustified barriers to the financing of projects in the market and measures to facilitate access to finance or unjustified regulatory barriers to renewables self-consumption, including for tenants. ▪ Rules on energy communities <ul style="list-style-type: none"> Art. 21, 2 (see above), Art. 21, 4 (see above), Art. 21, 6 (see above) Art. 22, 1: final customers, in particular household customers, are entitled to participate in a renewable energy community while maintaining their rights or obligations as final customers, and without being subject to unjustified or discriminatory conditions or procedures preventing their participation in a renewable energy community. Art. 22, 2: renewable energy communities are entitled to produce, consume, store, sell and share renewable energy and to access all suitable energy markets both directly or through aggregation in a non-discriminatory manner.

	<ul style="list-style-type: none"> ▪ Adopted in 2009, revised in 2018, 2023 <p>Art. 22, 3: member states shall carry out an assessment of existing barriers and potential of renewable energy communities</p> <p>Art. 22, 4: member states shall provide an enabling framework to promote and facilitate the development of renewable energy communities addressing, inter alia, unjustified regulatory and administrative barriers to renewable energy communities, the possibility to provide aggregation or other commercial energy services, the relevant DSO to facilitate energy transfers within communities, that renewable energy communities are subject to fair, proportionate and transparent procedures, including registration and licensing procedures, and cost-reflective network charges, as well as relevant charges, levies and taxes, ensuring that they contribute, in an adequate, fair and balanced way, to the overall cost sharing of the system in line with a transparent cost-benefit analysis of distributed energy sources developed by the national competent authorities.</p>
<p>Electricity Market Directive (Directive 2019/944)</p>	<ul style="list-style-type: none"> ▪ Incentivize the clean energy transition ▪ Integrated EU energy market, secure, sustainable and affordable energy supplies to EU citizens ▪ cross-border trade and competition ▪ Active citizens contributing to the energy transition ▪ More flexible electricity markets allowing for decentralised production of electricity from renewable sources. ▪ Driving Investments ▪ Part of Clean energy for all Europeans Package ▪ Adopted in 2019, to be revised in 2024 <p>▪ Definition of ‘active customer’ (Art. 2, 8; Art. 15), ‘energy storage’ (Art. 2, 59), ‘energy storage facility’ (Art. 2, 60)</p> <p>Rules on active customers:</p> <ul style="list-style-type: none"> ▪ Art. 15, 1: final customers are entitled to act as active customers without being subject to disproportionate or discriminatory technical requirements, administrative requirements, procedures and charges, and to network charges that are not cost-reflective ▪ Art. 15, 2: active customers are entitled (directly or through aggregation) to sell self-generated electricity, to participate in flexibility schemes and energy efficiency schemes, to delegate to a third party the management of the installations required for their activities (installation, operation, data handling and maintenance), to be subject to cost-reflective, transparent and non-discriminatory network charges accounting separately for the electricity fed into and consumed from the grid, to be financially responsible for imbalances they caused in the electricity system. ▪ Art. 15, 5: Active customers owning an energy storage facility (a) have the right to a grid connection within a reasonable time after the request, provided that all necessary conditions (e.g., balancing responsibility, adequate metering) are fulfilled; (b) are not subject to any double charges, including network charges, for stored electricity remaining within their premises or when providing flexibility services to system operators; (c) are not subject to disproportionate licensing requirements or fees; (d) are allowed to provide several services simultaneously, if technically feasible. <p>Claim for ensuring appropriate data exchange:</p> <ul style="list-style-type: none"> ▪ Art. 23, 1: For the purpose of this Directive, data shall be understood to include metering and consumption data as well as data required for customer switching, demand response and other services. ▪ Art. 23, 2: Eligible parties shall have the requested data at their disposal in a non-discriminatory manner and simultaneously. Access to and relevant procedures for obtaining data shall be easy and made publicly available.