Concepts, Formats, and Methods of Participation: Theory and Practice

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1   From Energy Landscapes to Participation

New energies form new energy landscapes (Apostol, Palmer, Pasqualetti, Smardon, & Sullivan, 2016; Gailing & Leibenath, 2013). Energy carriers converge within space and open up leeway and scope for design. Different spaces are affected: offshore and onshore, plains and mountains, waters, volcanic areas, coastal regions, deserts, etc. Different energy sources and types of technology are used and integrated through grids. Grids are increasingly governed as smart energy systems equipped with smart meters and apps etc., linked with smart mobility. Governments, regulators, businesses, trade associations and others shape the energy system. But energy is also transformed in, near and by communities (Devine-Wright, 2014). These processes of interaction between humans and their physical environment and interpersonal interactions can be theorized from different disciplinary and interdisciplinary perspectives using different theoretical approaches. Several terms have become canonical in this area, one of which we take on here: While the previous chapter deals with the first term of the handbook title – energy turnaround (or "Energiewende") – the following chapter is built around the second term, namely participation.

"Participation" is a concept widely used across social sciences and humanities. In political science, it is connected with the "participatory revolution of the 1960s" (Kersting, 2008, p. 48) including extensive work on functional and normative aspects of participation (e.g. Roth, 2011; Renn 2004) as well as the empirical results of various participatory instruments, including reviews of evaluations (Creighton, 2005; US Academy 2008; Christensen, 2011; Nanz & Fritsche, 2012). While participation generally has mainly positive connotations, several studies exist which question the benefits of (more) participation and point to, among others, power relations as a major obstacle to more democratic decision making via participatory procedures. Economic development is an illustrative case where such a discussion has taken place (Bude & Staab, 2016).

In this chapter we explore the concept of participation across different levels (macro, meso and micro), as being individual and collective, as involving bottom-up and top-down processes and between private economy, civil society and state/government. At its most basic, participation involves action, a 'taking part' in 'something'. As such, it requires participants, whether as individuals or collective actors. The 'something', applies here to energy transitions in all their diversity. Nonetheless, the idea is not to give a definition of participation which is applied throughout the whole handbook. This would be rather inappropriate since – as will be shown in the following sections – the meaning of the word differs from discipline to discipline and from subject to subject. While there is a certain danger that it may become what Pörksen (1995) has called a "plastic word" – malleable and loosely used to fit every circumstance –, it has to be born in mind that definitions cannot be "false" or "true", but only "useful" (or not) in a specific context (Poser, 2012). Thus, differences in the definition of participation may be well-founded with regard to differences in disciplinary and theoretical backgrounds. However, for fruitful inter- and transdisciplinary research a process of mutual understanding of the use of terms is necessary.

The following chapter introduces and discusses how the concept of participation is used in different contexts and how participation is conceived within the energy sector. In this respect, we will refer to other chapters of this handbook where aspects of participation are analysed in more detail. Thus, the chapter can be used as a compass to assist the reader in navigating through the book.

The chapter is organised as follows: We begin by discussing different types of participation in general (Section 2), before addressing the relationship between the governance of and participation in the energy sector (Section 3). Both strands of the literature – governance and participation – are strongly linked to each other. In Section 4, we introduce a range of existing perspectives which have been developed to explain different areas of participation in the energy transition. These considerations lead to the development of a framework presented in Section 5. We conclude the chapter with a discussion of main observations and implications (Section 6).

2   Types of Participation

Contemporary research on participation covers different application areas and modes of action, i. e. where and how participation takes place. Here we identify six types of participation discussed within this broad literature:

- **Financial and economic participation,** including for example energy purchase decisions, ownership and co-ownership of assets, participation in financial returns from these assets, payments from asset owners (rent, compensations), economic benefits for the community, or value added for the local economy. For further details see the contribution by Holstenkamp, Kahla and Degenhart, in this volume;

- **Industrial/workplace participation,** such as the co-determination and collective projects of workforces (Cloke & Goldsmith, 2002; Industrial Democracy in Europe, 1993; Wilkinson, Gollan, Marchington, & Lewin, 2012). See also contributions to this volume by Hellmann on presuming, Witterhold on energy consumption, Herbes et al. on employee management and Yildiz et al. on rural communities;
- **Political participation,** including citizen engagement in local energy policies, regional and/or national governments' energy and climate protection strategies and programs, engagement with energy policies of political parties and participation in forms of direct democracy such as referendums (Gabriel, 2013; Schweizer & Renn, 2013; Kaase, 2011; Kersting, 2008; van Deth, 2009). See also contributions by Ohlhorst, by Holtkamp, by Schreurs, by Ohme-Reinicke, and by Radtke, in this volume;
- **Civic participation** (as a special form of political participation): for the purposes of public participation in the context of infrastructure implementation), individual-citizen participation in cooperatives, etc. (Creighton, 2005; Renn et al., 2014; Schweizer et al., 2014; see also the contributions by Barth et al, by Huge & Roßnagel, by Kamlage et al., or by Kunze & Hertel, in this volume);
- **Social participation,** including engagement in local forums, civil society forums, events, campaigns, organizations, local groups and communities, neighbourhoods, urban districts, village communities (community participation) (Kaufman & Dilla Alfonso, 1997; Keil, 2013; Midgley, 1986). See also contributions by Mai, by Borchers and Hrach, by Singer-Brodowski and Mader, by Graf et al., or by Wäger et al., in this volume;
- **E-participation,** including taking part in electronic social networks, smart energy apps and online campaigns and petitions etc. (Kersting, 2012; Lindner, Aichholzer, & Hennen, 2016; Loader & Mercea, 2012). See also the contributions by Wehnert & Beckmann, by Witterhold, by Aichele, or by Bunschoten, in this volume.

Through this handbook we seek to introduce and show the diversity of forms of participation in current energy systems. As such the volume represents a practical, application-oriented access to participation in the context of the transition of the energy sector. It provides insights on consumers' and citizens' preferences on issues related to the energy sector's transition, but deepens further actor-centred aspects (e.g., cooperation, networks, integrated systems). Participation is analysed from the perspective of modern social and human sciences according to the following assumptions and initial conditions:

- *Participation is political.* It involves engagement in political processes, whether overtly or covertly. Participation is also embedded in meta-discourses about democracy and post-factual policy styles. This includes debate on the crisis of democracy (Agamben, 2012; Blühdorn, 2013; Crouch, 2004; Michelsen & Walter, 2013; Nanz & Leggewie, 2016), of the economic system (D'Alisa, De Maria, & Kallis, 2015; Mason, 2015; Streeck, 2013) and of the state (Heinze, 2009; Schiller, 2016;

Voigt, 2016; Voßkuhle, Bumke, & Meinel, 2013). Taken together, new relationships between the state and citizens are expected to arise, triggered by new forms of participation and cultures (Glaab, 2016; Jansen, 2012; Poguntke, 2015).

- *Participation is a social process,* exemplified by a new company culture characterized by integration, inclusion and diversity (Straßburger & Rieger, 2014).
- *Participation can also be material.* From mundane household objects through systems and infrastructures, material objects can be used as sites of and for participation (Barry, 2013; Marres, 2012).

From the discussion so far it follows that participation takes *a plurality of forms.* It involves both individuals and collective actors, which are being redefined over time. Several contemporary developments have led in the direction of less formalized, organized and hierarchical forms of participation, in contrast to situational, thematic and pragmatic forms, which function without rigid patterns of organization and with greater flexibility of media control: the medial participation (Dolata & Schrape, 2014; Hepp & Pfadenhauer, 2014.). Furthermore, one can add the relationship between citizen and state (Glaab, 2016) and the strong material, project-oriented and lifestyle terms of participation (de Moor, 2016), and different forms of civic engagement, volunteering and volunteerism and a new citizens' role in the form of civic/civil/social entrepreneurs (Goldsmith, 2010; Hjorth & Bjerke, 2006; Schaper, 2012; Stone, 2015) coupled to innovative sustainability practices (Shove & Spurling, 2012). These developments have the potential to break or alter previously held forms of social and political participation in a significant way (Dalton, 2008; Fox, 2013; van Deth & Maloney, 2012; van Deth, 2014; Zukin, 2006).

Also striking is the *diversity of forms* through which participation occurs. Moreover, there has been a notable expansion over time. As Chilvers and Kearnes (2016) note, compared to the relatively uncontested development of post war energy systems, today energy system change is being shaped by a plethora of participatory processes, mechanisms and interactions. These include, deliberative consultations and opinion polls through co-design of technologies and systems to explicitly citizen-led approaches to participation such as protests, activism and community energy. At its foundation Chilvers and Kearnes (2016) attribute this proliferation to a challenging of the relationship between science, democracy and technological progress. In turn this has led to calls for new understanding of participation, for a "remaking" and "reclaiming" of participation (Chilvers & Kearnes, 2016; Denecke et al., 2016; see also: Bertelsmann Stiftung & State Ministry of Baden-Württemberg, 2014). As such a guiding assumption is that participation is being fundamentally challenged, remade and some cases renewed.

As hinted at above climate change policy for energy transitions has become increasingly participation-orientated over recent years, as have other "green transformations" (Scoones, Leach & Newell, 2015). Taking a scalar perspective we note how more regional cooperation of actors and stakeholders can be observed, forming new local public and administrative structures (Fudge, Peters, & Woodman, 2016;

Gustafsson, Ivner, & Palm, 2015; Mey, Diesendorf, & McGill, 2016). In contrast, new transnational, supranational and international styles of energy policies are also being formed, wherein energy policy can be understood as a part and outflow of the international climate regime, from which significant influence on national and supranational policies emanates. Whilst the energy transition is still viewed as being primarily a national responsibility under the control of national governments, these developments suggest this could change in the near future. Overall, this suggests that we are facing an already visible pluralization of energy system solutions, which are triggered by regional/national control systems and path dependencies of certain actors and technical systems overcoming previously known limits.

3 Modes of Participative Governance and Types of Participation in the Energy Transition

Participation is intrinsically link to the concept of governance. Governance has been defined as "the totality of interactions, in which public as well as private actors participate, aimed at solving societal problems or creating societal opportunities" (Kooiman, 2003, p. 4). Several authors have also been working at the interface of governance and participation, i. e. on participation in governance and organisational arrangements (Blair, 2000; Borras & Edler, 2015; Fung, 2006; Newig, 2011; Papadopoulos & Benz, 2006; Pestre, 2008; Renn, 2008; Walk, 2008; Wilkinson et al., 2012).

In the governance literature, a distinction is made between different modes of governance, especially the central mechanisms and forms of transactions, i. e. market, hierarchy and networks (Benz & Dose, 2010; Schimank 2007, pp. 29 ff.).

The energy transition is governed through

- Participation of individuals or actors in top-down arrangements or bottom-up approaches of communities;
- (Publicly created) markets within different regulatory frameworks (e. g. tenders);
- Cooperation of stakeholders in planning, designing and building energy systems and in energy transition negotiations;
- Public support schemes and climate change mitigation measures;
- Collaboration of local stakeholders (in local actor networks), in joint ventures or civil-society cooperation.

In addition to currently dominant market-based energy policy (which includes its own particular form of participation) more participatory approaches are being sought and developed. Both types are based on the local actor collaboration considering horizontal governance arrangements in the actor networks and a government-driven top-down creation of engagement opportunities (Grote, 2012). Studies indicate that in particular the latter case can potentially contribute to a change in the relationship between the state and citizens as government agencies initiate citizen en-

gagement opportunities, allow for an open and informal dialogue and seek a close partnerships with civil actors (Glaab, 2016).

This is particularly evident in horizontal governance arrangements where participatory and collaborative practices and procedures are established. Through these processes new forms of governance are created, such as "participatory governance" (Grote & Gbikpi, 2002; Heinelt, 2002; Kohler-Koch, Quittkat, Buth, & Altides, 2013; Lindgren & Persson, 2011; Newman, 2005). Even if participatory governance structures are often looked upon favourably, problematic consequences are also possible, e. g. in terms of increased potential for conflict (Geis, 2002) and complex inter-organisational policy-making procedures on regional/state and national level (Bauer, 2015; Klagge & Arbach, 2013; Monstadt & Scheiner, 2016).

Governance can be understood as a condition that creates the opportunity to collaborate, cooperate and participate (Gailing & Röhring, 2016; Römmele, 2013; Sirianni, 2009). Collaboration, cooperation and participation may become part of a specific governance structure of a (sub-)sector and form specific variants and combinations of the basic modes of governance. Thus, "governance" represents a specific perspective from which to analyse participation. The meaning of governance is explained in more detail in Chapter 6 (Sack, this volume). Questions of economic governance are analysed in Chapter 16 (Theurl & Poppen, this volume).

4   Models of participation in Energy Transitions

While different forms of participation in and engagement with energy system change have been investigated, few studies look across potential energy system transformations to address the range of possible forms of participation (as discussed above). The diverse and plural ways in which participation can occur means this is no small feat. In addition, there is a lack of theoretical frameworks within both the social science studies of energy transitions and community energy literature, which analyse participation processes in the energy transition. In contrast to traditional approaches of participation research, which emphasize the individual perspective such as Sherry Arnstein's ladder of citizen participation (Arnstein, 1969), contemporary research efforts focus variously on context and actor-related perspectives.

4.1   Community energy perspectives

The research literature on community energy is rapidly growing, with a variety of disciplinary approaches being applied (part 5 of this volume is illustrative of this fact). In part this is because 'community' is a multifaceted term with a long history, often used ideologically and rhetorically.

Different meanings create different expectations on how community participation aids energy system change (Walker, 2011). In the following we draw on the work of

Gordon Walker, Patrick Devine-Wright and colleagues in particular, as providing a useful entry point to community energy and a model of participation.

In a review of the role of community in carbon governance Walker (2011) identifies six meanings of community – community as actor, as scale, as place, as network, as process and as identity – as well as the expectations of communities in terms of their participation in energy systems. He draws particular attention to the "assumed qualities of 'community as process'" (Walker 2011, 778) and highlights how social networks are thought to provide avenues for the communication of trusted information, how social ties may encourage local involvement and provide support for individual changes (behavioural and technological etc), how evolving place identities provide opportunities to enrol (national) carbon objectives into local narratives and how community involvement may result in innovation that is more responsive to individual needs and local context conditions. For instance, community involvement (with assumed qualities of community as process) has long been viewed as instrumental in determining the deployment of new technologies. Nonetheless, additional meanings of community (place, network, identity, scale and actor) are also implicated. The focus on communities as actors is most evident within the literature on community energy and ascribes agency to networks of individuals. Here, communities are expected to participate by taking actions of various forms and interacting with others. The varied meanings and expectations ascribed to communities mean that, "communities [are] seen as an integral part of wider innovation, learning, education, and diffusion processes, acting as a conduit, a lubricant and an exemplar for change" (Walker, 2011, 779). However, questions remain over whether these expectations can be realised in practice. Moreover, this understanding stresses localised, context-dependent understandings of potential engagement in energy systems. Less discussed are workplace and e-participation, along with broader political participation processes arising from community action, like national policy focussed campaigns.

In related work Walker and Devine-Wright (2008) developed a matrix of community energy participation, within a two-dimensional space: the process dimension on the vertical axis depicts the inclusion of individuals (open and participatory vs. closed and institutional). The outcome dimension on the horizontal axis represents distance and profit distribution (local and collective vs. distant and private). Specifically developed to conceptually distinguish community-based approaches from others (i.e. business-based approaches) this model can also be adapted to participation in energy system transitions in general where participatory processes are described by the process and the outcome dimensions.

Nonetheless, this well-received model for assessing the community basis of energy projects may need a revision. Devine-Wright (2014) sees the following gaps or overlaps:

- Network relationships between actors and between actor networks are not well represented. Joint ventures (shared ownership) blur boundaries between energy near communities and energy from communities. Pre-existing social networks

may be altered by community energy projects (i. e. strengthened, weakened, extended). Cooperatives may create new networks across place and interest. Moreover, it has to be analysed how social networks map onto both supporting and objecting action groups engaging with developer-led renewable energy projects.

- Linkages and exchange processes between different energy system scales (local, regional, national and international) are also not well represented. Most studies present analyses within a single scale. However, individual or household actions can lead to community actions, and vice versa. Shared ownership is an example of a connection between meso and macro scales.
- Feelings of belonging to a place need not refer to proximate places, but may well include distant ones.

Moreover, Walker and Devine-Wrights' framework provides a means through which to assess the degree to which a project, plan or process can be said to meaningfully involve communities. It does not, by itself map out the full spectrum of areas and means through which participation can occur in energy system transitions and as such offers a useful but partial picture of participation in contemporary energy systems.

In subsequent work Walker, Devine-Wright and colleagues developed a framework to understand public responses to renewable energy technology deployment (Walker et al., 2011, p. 11). At the centre of the framework sit interactions, between renewable energy technology advocacy networks (developers, consultants, marketing companies and so forth) and public actors, both individual and collective. Meetings, media reports, petitions and protests form a variety of interactions between the two actor groups from which expectations and anticipated outcomes are formed. For public actors this may be expectations about the impact of proposed projects whilst for advocacy networks this includes expectations about the public and due process. Expectations inform engagement strategies and actions for each actor group, which then influence further interactions. This cycle of interactions, expectations and actions form two corresponding cycles which feed into formal decision making processes and, in the end, to outcomes (decisions). The cycles are strongly linked to the local context, i. e. the locality and community as well as regional and local politics. The whole process is influenced by local strategies, technology design and incoming proposals and ideas (e. g. by whom and where the energy project will be built?).

Such perspectives offer an understanding of participation in very broad terms (the meanings and expectations of community energy, alongside the two dimensional framework) as well as providing a means to understand very specific areas like public participation in project approval processes. They do not extend to different modes of participation in the energy transition.

4.2   Socio-psychological perspectives

Socio-psychological perspectives investigate participation processes from the point of view of individuals acting within wider contexts and predominantly focus on agency and barriers to action. Here, Schweizer-Ries (2011, p. 191) has developed an approach which focuses on options and barriers of action that are influenced by physical, media, economic, legal-political and administrative conditions. Options and barriers of activities, perceptions and assessments can be affected by a "change system" – both on an individual and an organizational level. Again, the context is emphasized (nature, social, cultural, objects and processes). Overall, the model is non-linear, but thought as a dynamic, developing process. In addition, the author highlights the relevance of continuance (modelled as continuous process, necessity of time), commitment (related to the process and the proximity to the local, the requirements and to the targets) and communication (between groups and actors) (Schweizer-Ries, 2011, p. 197). This model also considers exchange processes and reciprocal relations; it is very open and flexible: Barriers and options are likely to appear in all projects. However, it is doubtful if such simplified models are useful in this context, since projects are characterized by individual specifics which represent the essential and relevant conditions.

Rau et al. (2012, p. 181) describe levels of involvement and contribution. They distinguish "involving persons" from "involved persons". Levels of involvement and contribution range from, at the lowest level, "give information" over "consultation/obtain opinions" and "cooperation/let co-decisions happen" to "delegate decisions" in the case of "involving persons". With regard to "involved persons", they list "receive and demand information", "contribute and give an opinion", "cooperation/support co-decision" and "accept responsibility/act on one's own authority". Thus, the approach represents the logic of individual participation and follows Arnstein's ladder of citizen participation. Under this model, individuals mainly take part in participation offers and so does not include bottom-up-approaches, collaboration or cooperation. Moreover, the model does not say anything about the contents and qualitative dimension of participation or the aspects of spatial and technological conditions.

Schröter et al. (2016) develop their model from findings of public participation processes. They stress the relevance of the quality of public participation procedures in addition to the framing. The former can generate acceptance and legitimacy as Schröter et al. (2016) assume. They distinguish various participatory arrangements after discussing thirty different definitions of citizen participation. This allows them to finally determine three super-ordinated criteria (inclusiveness, information exchange and learning, influence on political decisions) and several sub-criteria (platform for communication and negotiation, equal contribution, exchange of knowledge, common base of information, transparency, common understanding of the process, effectiveness/efficiency, shared understanding of impact of results) (Schröter et al., 2016, p. 4). According to the authors, a recursive method is necessary to capture these criteria adequately in the research process, including the preferences of participants in evaluations who tend to emphasize more the process or output quality, which in turn

can be proven concretely based on a case study (Schröter et al., 2016, p. 9). Accordingly, a flexible, situational and learning participation model emerges, which can be adapted in the process according to the changing preferences of participants. This learning and adaptive participation models seems coherent and convincing, but puts high demands on framing, organisation and concrete design of the participation measure.

4.3   Sustainability transitions perspectives

Work within the emerging field of sustainability transitions takes systems of production and consumption as its unit of analysis and analyses how new systems emerge through the interaction of artefacts, actors and institutions (Markard, Raven, & Truffer, 2012; see also chapters by März & Bierwirth and Berlo & Wagner, in this volume). Although the role of citizens and users has been present from the outset there is increasing interest to further conceptualise how the participation of users, citizens and civil society can engage in energy system change.

Of particular note for the present discussion, Smith (2012) conceptually maps civil society action on to a common understanding of transition processes as involving the development of protected alternatives within the context of a predominantly unsustainable set of regime practices encompassed by a slowly evolving set of norms, ideas and structural pressures (Geels, 2002). Clustering activity around these three levels Smith suggests civil society initiatives can be important for: (1) developing a repository of alternatives through citizen science, constructing grassroots alternative configurations to existing ways of provision, and being early adopters (consumers) of novel alternatives, which may individually and in sum create more sustainable alternatives that can challenge existing unsustainable systems of production and consumption, (2) civil society initiatives can destabilise existing systems by coordinating consumer boycotts, protesting and lobbying for change and by establishing new expectations and standards of energy systems, and (3) civil society can raise awareness of existing problems (i. e. climate change, air pollution) and increase societal pressure for reform in particular directions. Smith himself notes that such mapping should be seen as more illustrative than encompassing but compared to the above participation-based perspectives opens a wider array of spaces in which participation occurs.

Extending this strand of thinking but focussing more on user participation in energy system transitions Schot, Kangers and Verbong (2016) have developed a typology of user roles in transition processes. *User-producers* or entrepreneurs invent, experiment and tinker with new technologies, act to legitimise new solutions and develop new preferences and practices. This role is exemplified by the early user involvement in developing solar collectors, wind power and car clubs (Ornetzeder & Rohracher, 2013). *User-legitimators* construct protective spaces for potential sustainable alternatives by creating supportive narratives, rules and routines. *User-intermediaries* act as 'system builders' aligning system elements into configurations that work. As such they

prepare the ground for future adoption. *User-citizens* lobby for particular technologies or emerging solutions, challenge and destabilise existing practices and structures through protest actions and boycotts. Finally, *user-consumers* seek ways to embed new technologies into daily lives, they undertake the necessary testing, repair and maintenance work involved in making technologies actually work in practice.

Both approaches emphasise innovation and whole system change as core structuring elements. They draw attention to different stages and levels of energy system transitions and refer to both individual and collective forms of participation. Nonetheless, they also focus on 'civil society' and 'users' respectively *as (core) actors,* in Walker's (2011) framing, and say less about what spatial scales participation plays out.

In summary, none of the models presented above depicts participation in energy system transitions holistically. Different models seek to explain different forms of participation from different actor perspectives. Each offers a partial view of participation and individual aspects can be used to give an overview of participation in energy system transitions.

5   Energy Transition Participation: A Framework

For a strongly generalizing framework, we can draw on Devine-Wright's (2014) scale model. Since spatial levels play an important role in socio-technical developments (although often understated) and politico-economic negotiation processes, this reference point seems appropriate, as it is described in the literature as "politics of scale" (Cox, 1998; Leitner, 2004; Meadowcroft, 2002) and most recently highlighted in the context of water policy (Moss & Newig, 2010). Following Devine-Wright (2014), energy transition participation can be distinguished on three levels: micro, meso and macro. These different scales are summarised in Table 2.1: each row presents a different scale, with columns distinguishing geography, technologies, actors and forms of participation and indicative examples given in each.

At the micro level individuals, households and small local actors such as neighbourhood community energy initiatives operate. Individuals and households participate through the installation of household renewable energy technologies, by sharing their energy experiences through local eco-open home events or through financial investments in community energy initiatives. At the micro level energy technologies are small scale and decentralised. Household PV installations, heat pumps and solar thermal are utilised as are insulation measures and smart meters. Individuals and households also participate in traditional public participation procedures such as neighbourhood planning and consultations on local reforms. Small-scale and local citizen-led campaigns, protests and social movements are also possible. Thus micro level participation is possible across a wide range of areas including material, social, political and financial and economic. Less covered is workplace or industrial participation as this typically moves beyond household units and small scale actors. Micro level participation crosses over into meso level activity where individuals participate

Tab. 2.1 Forms of participation across energy system scales

	Geography	Technologies	Actors	Forms of participation
Macro	International	Electricity inter-connectors	International Energy Agency, European Union	Representation through national governments, lobbying, actor networks
	National	Centralised power generation plants	National governments and regulators, State utilities	Voting, consultations, collective switching, consumer choice
Meso	Region or city	Regional elec-tricity networks	District network opera-tors, Municipal energy companies	Regional voting, consultations, forums, local actor networks, campaigns
	Town/neigh-bourhood	District heating systems	Community energy initiatives	Neighbourhood forums
Micro	Buildings	Microgeneration	Households	Material installations, eco-open home events,

Source: Adapted from Watson and Devine-Wright (2011).

in regional energy infrastructure planning or where collective actors participate or collaborate in networks for wider change (for example, see Holtkamp, in this volume).

At the meso level, regional and city-scale actors are prominent. Distributed energy generation engages with increasingly two-way and responsive local electricity distribution networks as well as connecting to national electricity grid infrastructure. Community energy initiatives sit "ambiguously" (Devine-Wright, 2014) within this level depending on their size, governance structure, purpose and outcomes. Regional and city-scale actors include businesses operating within energy supply chains as well as those more actively engaging with material energy needs. Social enterprises, charities and religious bodies also participate as do car clubs, municipal energy companies through to district network operators. Participation takes a variety of forms depending on the actor. Local actors cooperate and collaborate, participate in forums and processes, exchange ideas, establish networks, engage in tendering processes, public funding and dialogues. Participation in local governance arrangements such as the formation of visions and rules becomes more important where cities and regions have more autonomous power to govern energy system change. Individual civic participation can also occur in these processes through regional voting, consultation and forums. Regional social movements advocate particular directions of change, whilst protests can rally for and against particular developments. Households can also engage with cooperative renewable energy installations or chose to purchase their electricity from municipal energy suppliers.

As well as clear links to micro level participation, the meso level also links to the macro level where business activity spans out, where regional social movements connect and link to national concerns and wider actor networks and where city and re-

gional aspirations link to international networks of pioneering energy cities, such as C40 Cities Climate Leadership Group or the European Convenant of Mayors (Bulkeley, 2010) or to regional events of supra-regional importance (forums, dialogues) (for example, see Schreurs, in this volume).

At the macro level national governments and businesses alongside international governance arrangements and agencies dominate. National electricity and gas transmission networks join through interconnectors linking remote energy generation to sources of demand. At the national scale sovereign governments, regulators, state utilities and business interests dominant. However, individual participation is also possible through referendums and voting, whilst a burgeoning array of citizen-led engagements in the form of campaigns, protests and social movements enable engagements with national issues. Individuals also participate through their energy purchasing decisions, such as participating in collective switching schemes or signing up to green supplier tariffs. Actors collaborate and negotiate within networks and participate in multiple forums. At the international scale sovereign governments partake in intergovernmental forums, agencies and institutions and lobbying networks seek to influence political processes and decisions.

6   Conclusions

Participation is and will continue to be central to any future energy transition. Financial and economic participation is likely to dominate as the de facto form of participation in contemporary energy systems because markets remain the principle coordinating structure and philosophy within current energy systems. Community participation is also, to a large degree, governed in this way. Nonetheless other types of participation are increasingly 'standing up' and 'being counted'. Any potential energy transitions are deeply political, involving the distribution of rewards and benefits, but also because taking steps to transform existing energy systems means asking fundamental questions about the future of society in relation to climate change and sustainability but also issues related to fuel poverty and social justice. Increasingly political choices are being taken that shape the direction of change. The choice to phase out nuclear energy in Germany is a good example of this.

Alongside economic and political participation new forms of participation are being sought, developed and in some cases, renewed. Specific forms of energy transition participation have been developed. Community ownership, formal and information public participation in the approval processes for energy infrastructure and referendums are pronounced forms of energy transition participation in Germany, for instance. These types of participation are characterised by great societal interest. Many citizens and other local actors have been set in motion and taken along – it is possibly the most participatory discourse in society at large. A special feature of energy transition participation is that many different groups (citizens, civil society, business, government) participate and that the subject matter is equally important for all. Overall,

the energy transition favours discursive formats (Voss, 2016), but also various forms of collaboration.

Furthermore, some specific characteristics of energy transition participation can be derived from the scale model presented here:

- At the micro level, bottom-up participation of local communities or citizens is relatively strongly developed but highly uneven.
- At the meso level, we observe an intensive exchange among actors in energy infrastructure projects, a strong demand for public participation, but also a high potential for conflicts.
- Overall, the macro level is still of less importance in the participative process of energy transitions. Central decisions on the direction, e.g. of climate change policy, are made at this level. But energy policy is still strongly influenced by large companies and national governments and therefore the relevance of citizen participation remains low on this stage (perhaps paradoxically). Moreover, the energy transition has led to a remarkable drifting apart of national and local-regional energy policy regimes.

Looking at the forms of participation, local negotiation processes on the one hand, about which still not very much is known (Brühne, 2015), and national governance regimes, on the other hand, are important with regard to exchange, blockages, linkages, spill-over effects, cooperation etc. In this sense, the meso level plays an outstanding role due to the actors operating as intermediaries. This handbook delivers insights into these settings, but an evaluation is still hardly possible. However, there is no strong indication of a bridging function of participation; usually participation remains a participation in a particular sector.

Finally, we can take a look into the future: It is conceivable that the further expansion of the energy infrastructure will lead to more conflicts (Bosch & Peyke, 2011; Månsson, 2015; Ohlhorst, 2010). Yet, the expansion will most likely be accompanied by a growing level of participation. The contributions in this handbook show that participation is a crucial factor or decision calculus of actors (creation of acceptance; Grunwald, 2004). However, whether this works out is not a questions of the quantity of participation, but rather the quality, as Ortwin Renn has been indicating (Renn et al., 1995). Concerns of the population and local actors have to be taken seriously. However, this is unlikely to be easy due to general participation fatigue as well as the challenge of balancing interests and reaching mutually agreeable decisions.

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