

RESEARCH ARTICLE



WILEY

Emerging dynamics of public participation in climate governance: A case study of solar energy application in Shenzhen, China

Ping Huang | Vanesa Castán Broto | Linda Katrin Westman

Urban Institute, Interdisciplinary Centre of the Social Sciences (ICOSS), University of Sheffield, Sheffield, UK

Correspondence

Ping Huang, Urban Institute, Interdisciplinary Centre of the Social Sciences (ICOSS), University of Sheffield, Sheffield, UK.
Email: p.huang@sheffield.ac.uk

Funding information

European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme, Grant/Award Number: 804051

[Correction added on 18 September 2021, after first online publication:

Acknowledgements & Funding information sections have been added in this version.]

Abstract

Climate governance scholars have recognized the role of public participation in improving the outcomes of climate action. Nevertheless, increasing advocacy of environmental authoritarianism in the narratives of climate governance questions the need for and legitimacy of public participation. This study uncovers the emerging dynamics of climate participation in Chinese communities through a case of the implementation of solar energy. Our research challenges the general impression of nonparticipation in climate governance in China and argues that participation is taking a less visible form that we call “defensive participation.” Defensive participation occurs when communities mobilize to defend their interests. Just as other forms of public participation, defensive participation can play important roles in improving policy outcomes and accountability. More nuanced theoretical and empirical accounts of public participation in climate governance will improve current understandings of climate governance in China.

KEYWORDS

authoritarianism, China, climate governance, defensive participation

1 | INTRODUCTION

Increasing involvement of actors beyond-the-state in actions for climate change mitigation has led to a rising interest in their role and operation (Newell, 2008; Andonova & Mitchell, 2010; Schroeder & Lovell, 2012; Paterson, 2014; Bulkeley & Newell, 2015; Chan et al., 2015; Pattberg & Widerberg, 2015; Falkner, 2016; Nasiritousi, Hjerpe, & Linnér, 2016; Bäckstrand & Kuyper, 2017; Bäckstrand, Kuyper, Linnér, & Lövbrand, 2017). Empirical evidence suggests that active participation of civil society, including NGOs and communities, supports the formulation of policies to alleviate climate change. For example, civil society plays a key role in improving the accountability of policymakers (Newell, 2008). Local communities are equipped with context-sensitive knowledge that can play essential roles in project

design, implementation, monitoring, and evaluation of mitigation actions (Bäckstrand et al., 2017). Instead of being passive recipients of public policies, communities and citizens are increasingly engaging in climate governance (Klenk et al., 2015; Meadow et al., 2015). Participatory approaches are the staple of multilevel governance, which is becoming an increasingly common mode of climate change governance. Examples of participatory strategies for climate change action have been described in different countries, such as the UK (Stagl, 2006), Denmark (Mendonça, Lacey, & Hvelplund, 2009; Sovacool, 2013), the Netherlands (van Buuren, Driessen, Teisman, & van Rijswijk, 2014), India (Tanner, Mitchell, Polack, & Guenther, 2009), and Mozambique (Castán Broto, Boyd, & Ensor, 2015).

China has implemented a variety of initiatives to reduce its greenhouse gas emissions (NDRC, 2015). Some commentators have pointed

This is an open access article under the terms of the Creative Commons Attribution License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.

© 2020 The Authors. *Environmental Policy and Governance* published by ERP Environment and John Wiley & Sons Ltd

out that China is successfully moving towards a transition to sustainable energy (Schreurs, 2017; Urban, 2018). China's positive results in climate change mitigation are often attributed to the strong political leadership of the government (Barbi, Ferreira, & Guo, 2016; Chen & Lees, 2016; Hochstetler & Kostka, 2015; Lewis, 2012; Lo & Howes, 2013; Mol, 2015; Shen & Xie, 2018). In these accounts, China's climate governance lacks a culture of participation in decision-making (Gilley, 2012; Li, 2013). If China is moving forward with climate ambitions under an authoritarian regime of environmental governance that lacks participation, what does this mean for governance theories that argue for the need to involve multiple publics to facilitate a sustainability transformation? If the case of China represents the success of an authoritarian, nonparticipatory regime, are participatory approaches needed for effective climate action? Some have even used the example of China to suggest that authoritarian regimes might be more capable of generating policy outputs than democratic ones (Beeson, 2010; Sowers, 2007). This perspective, however, arises from a bird's eye analysis of China's policy, as detailed analysis of local implementation and impacts of climate change policies are still scarce and limited to well-known examples, such as carbon trading in Shanghai (Lo, 2013; Wu, Qian, & Li, 2014) and eco-city schemes, such as the one implemented in Tianjin (Caprotti, 2014; Caprotti, Springer, & Harmer, 2015). More detailed analysis of local experimentation may help to understand the complexity of climate governance in China, and the multiple ways in which participation happens, which defy the conventions of Western-inspired environmental governance theory. Responding to these concerns, our research question is to what extent participation in climate governance is common in China, and how it happens.

In Western liberal democracies, political participation was originally conceived as actions aiming to influence the selection of elected politicians or their programs of action (Verba, Nie, & Kim, 1972). Acts of resistance, for instance in the form of demonstrations and protests, were eventually incorporated into the concept (Barnes & Kaase, 1979). Against a backdrop of a decline in traditional forms of participation in the Western world in the 2000s, political scientists documented a surge in novel forms of political expressions, such as political consumerism and civic group engagement, which also became seen as political participation (Dalton, 2014; Norris, 2002). Public participation was always conceived as a function of democracy, and hence, absent in authoritarian contexts.

Climate change is a complex domain where political action requires engagement across sectors and everyday activities (e.g., Bulkeley & Newell, 2015), making participation central to effective climate action. Climate participation encompasses multiple processes, including party politics, protests, civic actions, and hands-on projects, all with an explicit climate change agenda. In China, protests and civic actions led by green NGOs are increasingly influential in climate change policy (Liu, Wang, & Wu, 2017; Zhan & Tang, 2013). However, analyses of how everyday interactions between citizens can influence climate change are still missing.

We analyse a case of community involvement in climate change governance during the implementation of a solar energy project in a

residential community, the Qiaoxiang Village, in Shenzhen. The case challenges current definitions of participation and analyses of climate governance in China. First, the case shows that authoritarian governance is not suited to create long-lasting cultural changes that permeate society as a whole. Moreover, authoritarian governance may have unintended negative consequences on projects related to people's daily life. Second, the case demonstrates the operation of forms of participation less visible because they are embedded in people's lives. In this case, we observe "defensive participation." First coined by Weale (1999), this form of participation denotes participatory action that is taken to protect one's interests from being compromised or to avoid possible negative impacts. Just as other forms of participation, defensive participation can influence policy outcomes and accountability.

The article proceeds as follows. We review key debates on participatory climate governance in Section 2 and the role of participation in climate governance in China in Section 3. We introduce the study area, material, and methodology in Section 4. Section 5 presents the case of Qiaoxiang Village in Shenzhen, China, focusing on the participation practices of the community and the negotiations between different actors. We discuss the mechanisms and features of climate participation within the Chinese context in Section 6 and conclude with broader implications in Section 7.

2 | KEY DEBATES ON PARTICIPATORY CLIMATE GOVERNANCE

The dominant thought on climate change governance in the 2000s prioritized the action of leading actors, such as local governments, that needed political will to deliver and implement action. This perspective placed less emphasis on discursive forms of environmental governance that put a stronger emphasis on the process of decision-making (Betsill & Bulkeley, 2006; Bulkeley & Kern, 2006; Betsill & Rabe, 2009; Okereke, Bulkeley, & Schroeder, 2009; Bailey, Gouldson, & Newell, 2011; Bulkeley & Newell, 2015; Newell et al., 2015). When the 2015 Paris Agreement established voluntary approaches to climate governance as the primary paradigm (Hale, 2016), it also signaled a turn toward understanding the process through which governance occurs. This approach highlighted the coordinating role of orchestrating actors at multiple levels of governance (Bäckstrand & Kuyper, 2017). Research on urban labs (Wagner & Minca, 2014), experimentation (Bulkeley, Castán Broto, & Edwards, 2014), multi-actor transition processes (Frantzeskaki, Castán Broto, Coenen, & Loorbach, 2016) and adaptive governance (Boyd and Folke, 2011) map an ever-expanding set of actors in decisions for climate change governance.

Participatory climate governance brings together different traditions of thought from politics and development studies to provide an alternative to rationalist paradigms on traditional environmental management that dominated during the 1990s (Kapoor, 2001). Cooperative environmental management theorists embraced participatory methods and the development of partnerships as forms of social regulation that responded to the environmental crisis (Glasbergen, 1998).



A broad body of work followed that relied on multiple methods to bring a diverse range of actors into environmental management in areas such as participatory multi-criteria evaluation, participatory modeling of future scenarios, and participatory citizen science (Emrouznejad et al., 2010; Konidari & Mavrakis, 2007; Watson & Hudson, 2015). Since then, participation has become an essential management tool in the toolbox of environmental planners.

As participation gained increasing importance in environmental governance, Cooke and Kothari (2001) made a devastating critique of participation as the dominant approach to international development, whereby international development elites could capture and legitimate development projects. While elite capture has become a central concern for participatory professionals (Lund & Saito-Jensen, 2013; Persha & Andersson, 2014), scholars have continued challenging the fairness of participatory processes in local governance processes (Everatt, Marais, & Dube, 2010; Kundu, 2011; Rigon, 2014).

Many participatory professionals have witnessed with dismay the move towards an understanding of participation as a managerial tool, rather than as a tool for empowerment (Chambers & Foster, 1983). Hickey and Mohan (2004) responded to Cooke and Kothari (2001), first by presenting the process of participation as one which is incomplete, ongoing, and that requires the purchase of those involved. Such thinking resonates closely with concerns with participation that emerge at the intersection of environmental justice and political ecology. Building on Iris Marion Young's (2011) notion of justice as recognition, process-based concerns about environmental decision-making have gained ground in environmental justice debates (Agyeman, Bullard, & Evans, 2003; Schlosberg & Carruthers, 2010). In urban areas, participatory processes often led by informal settlement dwellers have brought about massive changes in service provision and the overall sustainability in those settlements (Nour, 2011; Otsuki, 2016). The notion of empowerment has been in itself subject to critiques about the extent to which people can be empowered just by being told what to do, but activists and communities have been able to demonstrate that they can mobilize and claim a space in climate governance. For example, many climate justice activists asking for participation demand that citizens and communities play a stronger role in climate governance (Bulkeley, Edwards, & Fuller, 2014). While participation is clearly incorporated into practices of community resilience, the role of participation in carbon emissions reduction activities is more ambiguous. In many ways, the rise of climate change experiments, including many community-led initiatives for renewable energy or waste management, can be thought of as a response to the lack of visible opportunities for participation of different groups in the international climate regime (Hoffmann, 2011). This can be seen as an active response to build new spaces of governance in a context in which alternative voices are foreclosed.

3 | THE ROLE OF PARTICIPATION IN CLIMATE GOVERNANCE IN CHINA

The highly centralized features of the state in China have fragmented over the past three decades, while political power has diffused across

an increasing number of actors (Dumbaugh & Martin, 2011; Lieberthal & Lampton, 1992; Sun, 2016; Tsang & Kolk, 2010). Non-state actors are acquiring new functions and providing input into decision-making processes in environmental policy at multiple levels (Carter & Mol, 2013; Lo, Li, & Chen, 2020; Mai & Francesch-Huidobro, 2014). The formulation of energy policy involves the participation of parastatal research bodies (also labeled government-owned NGOs), corporations, and actors in transnational networks (Meidan, Andrews-Speed, & Xin, 2009; Schroeder, 2008; Shen, 2017; Tsang & Kolk, 2010). The industry is an important source of knowledge in climate experimentation at the local level (Lo et al., 2020). While the formation and operation of NGOs in China have challenges (e.g., Ho, 2007), green organizations are among the most active and influential in China's civil society. Zhan and Tang (2013) have documented the ability of green NGOs to express ideas, exchange information, and achieve collective goals through educational campaigns and nonconfrontational projects.

New communication channels in social media create spaces for participatory capacity (Tang, 2014). Collaborative networks between local citizens, media, advocacy groups, and lawyers have created opportunities to influence local decision-making processes (Ergenc, 2014). Local councils engage the public in debates through various formats, such as consultative meetings, deliberation in village elections, citizen evaluations, and residential assemblies (He & Warren, 2011; Leib & He, 2006). Analyzing these interactions, Leib and He (2006) describe China as an authoritarian system at a macro level with democratizing practices materializing at a micro-level. Zhou (2012) proposes that these processes evidence a state-led immature deliberative democracy. This is perhaps tolerated to maintain stability and political legitimacy at the local level while avoiding reform of the overall system.

Nevertheless, the evidence of participation in China remains anecdotal (Geall & Hilton, 2014). Public participation often serves a procedural function and is closely supervised by the state (Sun, 2016). Qi and Zhang (2014) argue that public participation in China is ineffective because of a lack of data and accountability. Westman, Castán Broto, & Huang (2019) show that nonstate organizations and communities play little role in climate governance, and public participation means little more than consultation. Elite capture prevails in rural China, where local elites dominate participation processes within poverty eradication programs (Tian, Speelman, & Zuo, 2019), land reforms (Wilmsen, 2016) and welfare programs (Han and Gao, 2019).

Some scholars argue that ideologies of social subordination and obedience, deeply rooted in the Chinese Confucian philosophy, shape Chinese people's participation in governance (Dang, 2018). This argument legitimizes the operation of the authoritarian regime. Moreover, limited access to climate knowledge results in a relatively low level of public awareness about climate change-related issues (Du et al., 2018). As noted by Martens (2006, p. 212), "public participation in the field of China's environment remains heavily influenced by the power relations that are typically associated with an authoritarian regime."

Yet, environmental governance in China cannot be reduced to the operations of an authoritarian state. Participation in climate politics in

China takes place in a manner that remains invisible to forms of analysis that rely on participatory accounts of governance in a Western context. Weale (1999, p. 128) defined “defensive participation” as participation “where one participates only to prevent other people from damaging one’s own interests.” Weale describes a situation in which individuals are aware of others’ interests conflicting with their own, and where participation produces no gain for either side. Following Weale, defensive participation in China (*weiquanshi canyu*) emerges as a distinct mode of climate governance.

First, defensive participation follows individual or community resistance to a specific issue. Some commentators have noted that public participation in China has been driven by individual interests. This has raised critiques akin to those in the West about people that protest to protect their neighborhood, but not similar developments elsewhere, that is, “not-in-my-backyard” (NIMBYism) (Sun, 2016; Wang, Sun, Yang, & Yuan, 2016; Xu, 2007). For example, Wang et al. (2016) showed that Chinese citizens would not join anti-smog activities unless the activities benefit or harm their own interests. Social mobilization and protest also emerge as a defense reaction to government-led environmental policy (Deng & Yang, 2013; Han, Swedlow, & Unger, 2014; Mertha, 2014). In this context, we understand defensive participation as a reactive political behavior that follows conflict and need. Defensive participation differs markedly from deliberative engagement in planning or managing projects, moving instead to the terrain of protest (rather than proactive engagement) and resistance (rather than deliberation). Defensive participation may be the only avenue open to residents and communities who face large-scale changes in their neighborhood.

Second, defensive participation can act as an alternative mechanism to ensure accountability within a political apparatus with limited democratic functions. In a democratic system, accountability is exercised by making political agents answerable and responsible for their actions. The assumptions are that information about political interventions is available, that public bads can be attributed to decision-makers, and that responsibility entails consequences for negative outcomes (for example, through elections or disciplinary procedures) (Palumbo, 2017). While such mechanisms are unavailable on a macro-level in China, researchers have shown that nonelectoral local institutions, such as mechanisms of local revenue collection, channels of public disclosure, or the work of solidarity groups (Su & Yang, 2005; Tsai, 2007), provide alternative entry points to secure local government delivery on citizen demands. Informal accountability functions as a mechanism that ensures that local government “will provide public goods responsibly” (Tsai, 2007, p. 356). The critical level is the communication of citizens’ preferences to local decision-makers to prevent the delivery of public bads. When policies fail at the local level, defensive participation is activated to signal discontent and rectify the lack of positive outputs. Defensive participation thereby operates as a micro-level mechanism to ensure accountability against failures in the delivery of public goods at the local level. This view on ensuring accountability by monitoring policy delivery (an output-oriented view) links with ideas on political legitimacy in China. China’s political system is often assumed to maintain stability through its

production of substantive political legitimacy, the idea being that delivery of benefits such as prosperity, modernity, equity, and environmental protection produces support for the political leadership (Guo, 2003). To reproduce political legitimacy at the local level, it is necessary to have communicative mechanisms for discontent related to public goods in place, which is why defensive participation plays an important role.

Third, because it takes place within a semiauthoritarian system, defensive participation is likely to have restricted access to traditional political channels. In the absence of formal mechanisms to submit complaints or engage local officials, residents use alternative channels, such as appealing to higher levels of government, engaging media, or accessing the legal system (Van Rooij et al., 2014; Minchun & Bao, 2012). Due to these restrictions, defensive participation is likely to be opportunistic and ad hoc, experimenting with different methods in the search for strategies that work.

Building upon the concept of “defensive participation,” our analysis in the case of Qiaoxiang village in Shenzhen suggests that public participation in China is not uncommon, although it takes place in different ways than those that have been traditionally described in the literature. The case analyses the particularities, mechanisms, and effects of public participation in China’s climate governance.

4 | STUDY AREA, MATERIAL, AND METHODOLOGY

Shenzhen is a coastal city located in the southeast of China, immediately to the north of Hong Kong. It has a population of 12.52 million, and the urban built-up area is 923.25 km² (SBSM, 2018). Among Chinese cities, Shenzhen has led multiple initiatives to deliver urban low-carbon transitions. Shenzhen was among the eight low carbon pilot cities selected in 2010 by the National Development Reform Commission (NDRC, 2015). This was one of the first national-level programs for low-carbon urban development in China, under which Shenzhen’s municipal government committed to increasing the share of natural gas, solar PV, biomass and wind energy to at least 60% of the total primary energy use in 2020 (Khanna et al., 2014). In the building sector, renewable energies have been implemented at a large scale and in a mandatory fashion. As early as 2006, the municipal government of Shenzhen promulgated the mandatory installation of solar water heating (SWH) systems in newly built buildings. In the same year, the design of a roof-mounted SWH system in Qiaoxiang village was initiated to make the neighborhood a national role model for energy saving in buildings (Shenzhen Evening News, 2006).

As shown in Figure 1, Qiaoxiang village is an affordable housing community constructed by the municipal government of Shenzhen, covering a total area of 0.18 km² and a total construction area of 0.51 km². Completed in 2009, it was at that time the city’s first demonstration project for the application of SWH systems in high-rise buildings. The SWH system involves a total investment of RMB 23.68 million, which is claimed to be the world’s largest SWH system installed in high-rise buildings (Shenzhen Special Zone Daily, 2016b).



FIGURE 1 The layout of buildings in Qiaoxiang village (source: photo taken by the first author in Qiaoxiang village) [Colour figure can be viewed at wileyonlinelibrary.com]

There are 22 high-rise buildings in the neighborhood, with a total floor level ranging from 32 to 35 floors. A total of 2,160 apartments in the upper 18 floors of each building are equipped with SWH facilities. The SWH system in Qiaoxiang village was put into use in 2012. However, functional problems emerged after only 4 years' service, and multiple actors got involved in a contentious negotiation process over the fate of the SWH project.

Our methodology analyses the emergence of participatory processes in climate governance over time, examining the broader consequences for the community. The primary empirical materials were collected during a field trip to Shenzhen in 2017. As shown in Table 1, 32 semistructured interviews were conducted with government officials (2), local media (2), industry experts (1), and residents of Qiaoxiang village (27). In addition to interviewees who were reached through personal contacts, on-site interviews with residents were conducted by four investigators in the neighborhood of Qiaoxiang village from September 29 to October 1, 2017. A document analysis based on data sources of government reports, policy documents, and local newspapers complemented the analysis of interview data.

5 | EMPIRICAL ANALYSIS

The analysis shows the different stages of defensive participation in Qiaoxiang village. Table 2 provides an overview of the main actors involved.

5.1 | SWH installation in Qiaoxiang village: Authoritarian governance and the tendency of nonparticipation of residents

Since the early 2000s, responding to intensive low-carbon policies at the national level, Shenzhen started the radical application of renewable energies, and the city was listed by the Ministry of Housing and Urban-Rural Development (MOHURD) as a pilot city for various national-level initiatives of energy conservation and environment protection. Early in August 2004, MOHURD designated Shenzhen as the "Pilot City for the Application of Building Energy Saving Regulation in Hot Summer and Warm Winter Zone." Later in 2006, Shenzhen was selected as the "Pilot City for the Scaling-up of Renewable Energy (Solar Energy) Buildings" and the "National Pilot City for the Modernization of Housing Industry" (Economic Daily, 2010). Shenzhen enacted a "Building Energy Efficiency Regulation" in 2006, which for the first time specified the mandatory installation of SWH systems in public buildings, as well as in residential buildings of 12 floors or below (SCSMPC, 2006). The municipal government intended to make Qiaoxiang village a role model of an energy-saving neighbourhood, with the installation of the world's largest SWH system in high-rise buildings (Shenzhen Special Zone Daily, 2016b). One government official explained:

Responding to national strategies to promote the application of renewable energy in buildings, the municipal government chose to pilot in government-funded

TABLE 1 Interview information

Actor type	Actor affiliation	Date	Number of interviewees
Government official	Housing and construction bureau of Luohu district, Shenzhen	September 26, 2017	1
	Housing and construction bureau of Longgang district, Shenzhen	October 5, 2017	1
Local media	Southern Metropolis daily	September 19, 2017	1
		September 20, 2017	1
Industry expert	Guangdong Wuxing solar energy Co., Ltd.	September 19, 2017	1
Resident	Qiaoxiang village	September 21, 2017	1
		September 22, 2017	1
		September 24, 2017	1
		September 29, 2017	13
		September 30, 2017	7
		October 1, 2017	4
Total			32

projects. Against this background, the Qiaoxiang village became the first project in Shenzhen to install SWH systems in high-rise residential buildings. This was also a pioneering initiative in the country. (Shenzhen Special Zone Daily, 2016a)

Qiaoxiang village is a public housing neighborhood, in which the housing was provided by the government as welfare (i.e., sold at much lower prices than the market price) to qualified civil servants (e.g., teachers, doctors, lawyers, and governmental officials) in Shenzhen. Residents were selected based on a scoring system only after the completion of the project. The municipal government installed the SWH system for households to use the facilities free of charge. Following practices of top-down governance, the municipal government decided to pilot a new technology that was still immature in a large-scale residential neighborhood (Shenzhen Special Zone Daily, 2016a). Although a community was not yet formed to engage in the planning and initiation of the project, the decision was made without public consultation. As described by a resident:

In fact, I do know about the SWH system. I also worked in the government. I know that at that time it

TABLE 2 Main actors involved in the case of Qiaoxiang village

Actor type	Role description	The general stance of the actor
Government	Housing and construction Bureau of Shenzhen Municipality (HCBSM)	Main responsible department for the implementation of SWH application in Shenzhen; main decision-maker for SWH installation in Qiaoxiang village.
Residents	Group A	Residents with the SWH system preinstalled in their housing, whose daily life has been highly influenced by the functioning of the system.
	Group B	To retain the system To discard the system
Intermediary organization	Property owners committee (POC)	A committee formed by residents for daily management of neighbourhood affairs; the main intermediary actor between the government and residents.

(the SWH system in Qiaoxiang village) was a national (demonstration) project, pushed by the central government. Hence the project was initiated when the technology was still immature.

The construction of Qiaoxiang village (along with the integrated SWH system) was completed in 2009. In 2012, qualified residents for public housing started to move in, and the SWH system was put into use. Initially, residents were generally satisfied with the integration of SWH systems in their housing. Some residents viewed the SWH system as welfare, or even as a privilege, provided to them by the government. Others saw it as an opportunity to embrace a greener lifestyle. As expressed by two interviewees:

Using the SWH system is, in a sense, to answer the call of the government to promote energy conservation and protect the environment.



SWH technology is undoubtedly environment-friendly. Of course, I support the government's actions in energy saving and environmental protection. This is the most important [target].

However, there were also complaints from those residents who were reluctant to use the SWH system. As recalled by a resident:

When I moved in, I wanted to use gas water heaters. However, the government did not allow us to install gas water heaters by ourselves. I had no choice. I know some neighbours who installed a gas water heater secretly when they decorated their houses. I should have done that as well.

At least some residents accepted the government's decisions because they felt that no choice was available to them. Even for those who refused to use the installed SWH system, they resorted to informal solutions, rather than to make formal complaints to the government, thus tacitly accepting the guidelines.

Despite these different reactions, residents displayed a general tendency to indifference. The rare complaints did not lead to active resistance, and residents generally accepted what the government offered. Conflicts, when they arose, were resolved by affected residents at the individual level. Resistance, while not visible at this stage, gained traction during the project implementation and generated a particular brand of defensive participation that reflects a more general approach in climate governance in China, as explained below.

5.2 | The emergence of defensive participation triggered by the bankruptcy of Prosunpro

The SWH system in Qiaoxiang village was installed and managed by Shenzhen Prosunpro Solar Energy Company. Prosunpro was established in 1993, specializing in solar energy applications. In 2008, Prosunpro won the bidding for the Qiaoxiang village project. At the end of 2014, the company went bankrupt. Interviews show that the bankruptcy of Prosunpro acted as a trigger for the escalation of conflicts among residents and their defensive participation afterward.

Households had signed a 15-year-long contract with Prosunpro. Prosunpro's bankruptcy left many issues unresolved, of which an immediate consequence was the lack of daily maintenance and management of the SWH system. From February 2015, residents began to complain frequently about the disrepair of some parts of the system, resulting in instability of hot water, which was especially disturbing in cold weather. The Property Owners Committee (POC, *yezhu weiyuanhui*), an organization that is supposed to represent the interests of residents of Qiaoxiang village, conducted official communication with the government.

The POC contacted the Housing and Construction Bureau of Shenzhen Municipality (HCBSM). According to a meeting summary of the POC, on June 4, 2015, the POC met with HCBSM for the first time and discussed the issues concerning the SWH system in Qiaoxiang village. Besides the meeting, the two parties also

communicated frequently through phone calls. First, the HCBSM asked the POC to collect the overall opinions of residents who had been using the SWH system. In August 2015, the POC organized the first meeting with households. Later in October, a second meeting was arranged by the POC with a preliminary questionnaire handed out to residents who attended the meeting. The questionnaire was designed to survey users' general opinions on the SWH system. However, as indicated by POC, there were different opinions during the two meetings, and two stances emerged regarding whether or not to abandon the SWH system. One side did not want to use the SWH system and viewed the bankruptcy of Prosunpro as an opportunity to urge the government to discard the whole system (Group B in Table 2). In contrast, the other side thought the system itself was in good condition and sought to find a new solar energy company to replace Prosunpro in the daily management and maintenance of the facilities (Group A in Table 2). The POC, which was supposed to represent all the residents in Qiaoxiang village and be relatively neutral, strongly opposed the retaining of the SWH system. Rumors among residents indicated that one influential member of the POC lived on the top floor and suffered from an SWH-related noise problem, but this information cannot be verified.

Unofficially, media became a channel for complaining. In December 2015, desperate residents resorted to media to cover what was happening in Qiaoxiang village after the bankruptcy of Prosunpro company. The local press in Shenzhen covered this issue, questioning the malfunction of the SWH system in cold winter and its lack of management.

Individual measures could no longer address the problems of the SWH system that surfaced after Prosunpro's bankruptcy. Residents, in a desperate defense of their interests, resorted to both official and unofficial channels to voice their complaints. Residents' stance towards the installed SWH system changed from indifference and passive acceptance to a proactive position. However, significant disagreement among residents themselves meant that the credibility, legitimacy, and effectiveness of participation, in this case, was put into question.

5.3 | More defensive participation in response to the government's transformation plan of the SWH system

Ever since the bankruptcy of Prosunpro, the Shenzhen municipal government, or more specifically, the HCBSM, has shown their willingness to resolve the problems of the SWH system in Qiaoxiang village. For instance, HCBSM solicited residents' opinions through the POC and even consulted local experts for possible technical solutions. However, just like the POC, the HCBSM was more apt to (at least partly) discard the SWH system. Underlying this stance were some political calculations. First, although the trigger of the outbreak of various problems was the bankruptcy of Prosunpro, it was challenging to find a new SWH company who would be willing to replace Prosunpro and take care of the daily maintenance of the SWH system. The

project was not considered profitable because the SWH system was heavily subsidized by the government, and residents paid a meager price for the use of hot water. Second, to maintain the SWH system, the replacement of the aging equipment would be costly without solving issues such as noise and unstable hot water. With fewer residents using the system, every household would need to pay more for daily uses of hot water on average. Even if HCBSM could find a new SWH company to replace Prosunpro, the SWH system would continue to generate conflicts and social unrest in the future. At the same time, in 2016, the implementation of SWH technology in residential buildings in Shenzhen as a citywide strategy was regarded as unsuccessful (Huang, Castán Broto, Liu, & Ma, 2018). The municipal government no longer mandated the installation of SWH systems in buildings after 2014 and terminated the subsidy for SWH technology. Low carbon priorities had shifted from SWH technology to solar photovoltaic technology (HCBSM, 2014; HCBSM, 2015).

In April 2016, the HCBSM posted a notice in Qiaoxiang village. Entitled “*Notice on soliciting opinion on the transformation plans of the SWH system*,” the notice listed three options of transforming the system: first, to maintain the whole body of the system, and only repair some parts that cause primary problems such as noise and leakage; second, to maintain the solar thermal system,¹ but to discard the air source heat pump system as an auxiliary heat source and install instead gas water heaters for households; third, to abandon the whole SWH system, and replace it with gas water heaters (Table 3). It is important to note that, along with this notice, a note was provided indicating that plan A (retaining the system) actually would not be considered as an option. This immediately triggered the defensive participation of those residents who wanted to keep the SWH system. The main reason behind these residents' standpoint was that the transformation could cause damage to the current decoration of their home, which is usually costly in China. To get their voices heard by the government, they started to seek various ways of participation.

In May 2016, Qiaoxiang village was intensively covered by Southern Metropolis Daily, a very popular and influential newspaper in Guangdong province, the jurisdiction of Shenzhen city. The reports sharply questioned HCBSM's intention of partly or entirely

abandoning the SWH system. In an interview, the journalist who wrote these pieces of the report explained that he was initially approached and contacted by a resident in Qiaoxiang village, who was worried about the government's intention to discard the SWH system. He wrote the first report on Qiaoxiang village on May 5, 2016. The next day, on May 6, 2016, the journalist gave a more detailed coverage on the issue, and, on the same day, the HCBSM called a media briefing to explain the whole issue of Qiaoxiang village to the public. Southern Metropolis Daily was not invited by the HCBSM as they usually are. The day after the media briefing (May 7), two local media outlets reported the story of Qiaoxiang village, indicating the government's intention of transforming the SWH system, and explained the three options of the transformation plan. On May 9, 2016, the deputy director of HCBSM, together with a group of officials and experts, went to Qiaoxiang village and met with POC to discuss the transformation plan and the progress of opinion solicitation. Resident representatives did not attend this meeting.

The solicitation of opinion officially started on July 13. A questionnaire survey was distributed to every household using the SWH system, who were asked to choose from the above three options of the transformation plan. According to data released by HCBSM, until July 31, 1,362 questionnaires were handed out and 1,274 collected, of which 355 households selected plan A, 514 plan B, 196 plan C, and 209 abstained. Based on the results of this questionnaire survey, HCBSM made the final decision of choosing plan B as the transformation plan, under which the solar thermal system would be retained, but an auxiliary heat source, the ASHP system, would be replaced by gas water heaters. According to HCBSM, the expenses for transforming the system would be covered by the government, and residents could even get compensation for possible damages to the existing decoration of their houses.

Measures such as the questionnaire survey led by the government are often interpreted as efforts to make the decision-making process transparent and inclusive, trying to involve every stakeholder and giving them opportunities of expressing their opinions. However, residents saw it as a policy tool that had to be disputed. For example, one resident recalled:

They gave us three options to choose from... But the questionnaire was misleading. Under the option of plan A (retaining the SWH system), they listed many disadvantages of this plan. They also gave a deadline; after that date, if we changed our mind, they would not replace the facility for us.

Moreover, media, as an essential channel for defensive participation, seemed to have been, as termed by an interviewee, “controlled” by the government. After the intensive critical coverage of Qiaoxiang village in May 2016 by Southern Metropolis Daily, starting from July, media coverage, which often followed key moves of HCBSM, seemed to become highly identical in covering dates and the main content (with a similar stance to HCBSM's). Meanwhile, the previous journalist

TABLE 3 Transformation plans provided by HCBSM

Transformation plan	Solution
Plan A	To maintain the whole body of the system, and repair some parts that cause major problems such as noise and leakage
Plan B	To keep the solar thermal system, but discard the air source heat pump system as the auxiliary heat source and install gas water heaters instead in every apartment.
Plan C	To abandon the whole SWH system, and replace it with gas water heaters

Abbreviations: HCBSM, housing and construction bureau of Shenzhen municipality; SWH, solar water heating.

from Southern Metropolis Daily, who took a very critical stance on HCBSM, was replaced by a different journalist.

Under this situation, some residents who opposed HCBSM's decision started to resort to more formal means of participation: reporting to superior institutions. They wrote and sent letters to the Mayor of Shenzhen, as well as the central inspection group (*zhongyang xunshizu*), and expressed their strong opposition to the transformation of the SWH system. This mechanism of participation represents a flow of opinion from bottom-up (residents to higher-level government institutions) → top-down (higher-level government institutions to lower-level government departments). This tactic seemed to be very effective: although HCBSM retrieved the final results of the questionnaire survey in late July, until September, there had not been any concrete moves from HCBSM.

On September 1, 2016, HCBSM organized a meeting, in which both sides of resident representatives, the POC, experts, and media were invited. The main aim of this meeting was to reach an agreement on the final decision of the transformation plan. After the meeting, media coverage indicated that critical stakeholders had reached a consensus, with the final choice of plan B over the other two options. An interviewee stated that fierce confrontations had taken place between the two sides in this meeting. According to this interviewee, the "consensus" claimed by HCBSM and the media was not reached, because HCBSM and the POC had manipulated the participation process. Nevertheless, the transformation project formally started on November 21, 2016, and until December, 75 households had completed the installation of gas water heaters in their houses. Meanwhile, some residents who opposed the plan continued writing to superior institutions, such as the central inspection group (the latest letter received on December 6, 2016²). The two sides seem to have been stuck in a deadlock ever since.

6 | DISCUSSION: CLIMATE PARTICIPATION WITH CHINESE CHARACTERISTICS

The case of solar energy implementation in Qiaoxiang village offers insights into the mechanisms and features of climate participation within the Chinese context. Defensive participation depends on the evolution of action in response to external events. Figure 2 presents the timeline of key events marking the different stages of defensive participation in Qiaoxiang village.

First, the case captures a distinct form of climate participation in China—defensive participation. This form of involvement is reactive because it depends on residents' engagement to defend their interests. In this case, residents were originally indifferent to the mandatory use of the SWH system and tended to absorb any problems or inconveniences. Before the government's decisions had a tangible impact on their lifestyles, residents showed a strong tendency towards non-participation and nonengagement. When problems emerged after Prosunpro's bankruptcy, residents resorted to informal channels of complaining (e.g., media). If the bankruptcy of Prosunpro triggered defensive participation of those who wanted to get rid of the SWH system (Group B in Table 2), the government's announcement of the transformation plan provoked defensive participation of those who wanted to retain the system (Group A of Table 2). Regardless of their actual interests, both sides showed strong motivations to participate, to get their voices heard, and eventually, to influence the outcomes of decision-making. This finding challenges the general impression of nonparticipation of Chinese residents in climate governance and indicates that the extent to which public participation is visible in China depends very much on the extent to which proposed interventions jeopardize the local communities' interests. It follows

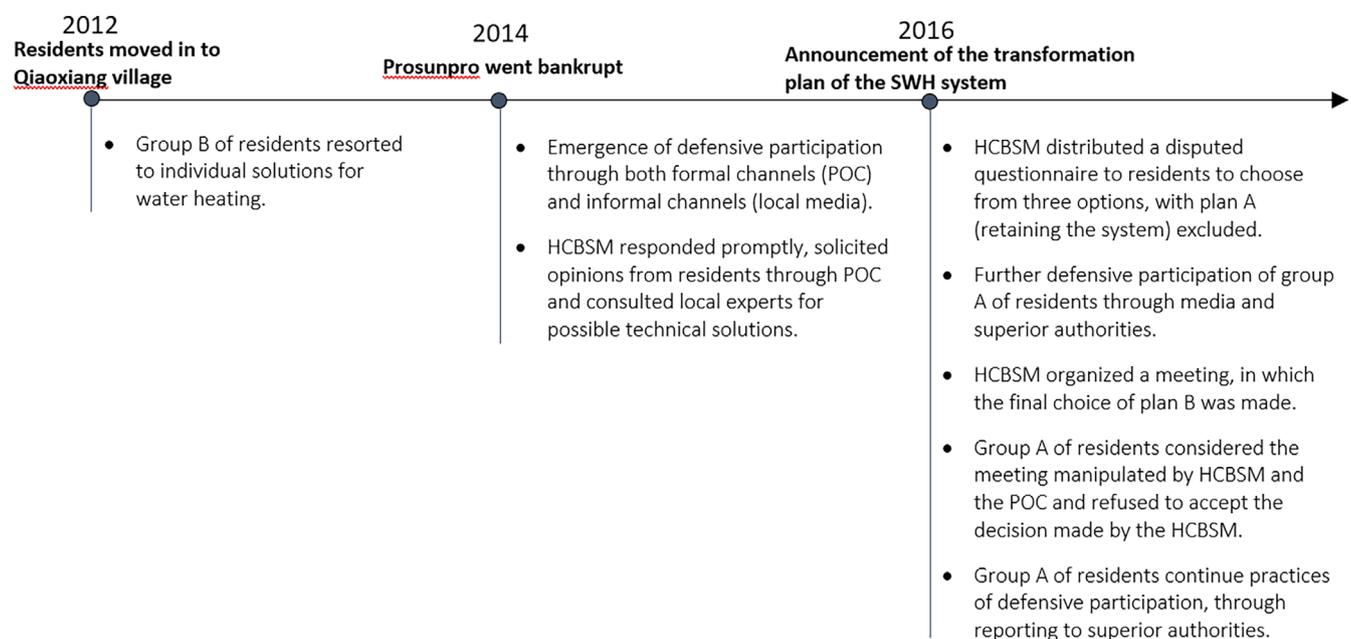


FIGURE 2 Timeline of key events [Colour figure can be viewed at wileyonlinelibrary.com]

that defensive participation is most likely to happen in the implementation of technologies that are closely related to people's daily life, such as the SWH technology. This is particularly the case when there has not been sufficient preproject public participation necessary to avoid unintended social consequences that would trigger defensive participation.

Second, the case of Qiaoxiang village shows how defensive participation can function as a last resort mechanism to ensure accountability in a semi-authoritarian state. When climate policies fail to deliver the intended outcomes at the local level, defensive participation provides the government with a clear signal of the need for policy adjustment. HCBSM's prompt response to the problem after the bankruptcy of the SWH company proved the effectiveness of this form of participation. The transformation plan of the SWH system and the compensation offered to affected residents revealed HCBSM's willingness to take the responsibility to resolve the issue. Although HCBSM's apparent stance to abandon the SWH system has, to a certain extent, jeopardized the credibility and legitimacy of the formal participation process led by HCBSM, the defensive participation of residents in Qiaoxiang village did ensure the accountability of policymakers. Further, it pushed HCBSM to not only look for solutions in a single case but also think critically about the overall strategy of SWH implementation in the city. The termination of the citywide mandatory installation regulation signals a policy learning process. This means that defensive participation can be a governance function employed to enhance the legitimacy of local policy experimentation (Heilmann, 2008), through which the disadvantages of new programs are communicated to local or national decision-makers.

Third, concerning the mechanisms of participation, residents engaged in several strategies to mobilize support for their concerns—all of which met with significant difficulties. Previous studies have documented opportunities to engage with political processes through media channels in China (e.g., Chilvers & Longhurst, 2012; Pallett, Chilvers, & Hargreaves, 2019; Segerberg & Bennett, 2011; Tang, 2014). The community in Qiaoxiang village attempted to express resistance through media but found that news channels were highly controlled by political actors. When accessing formal news became difficult, residents resorted to higher-level authorities to exert pressure on lower-level government entities. This way of voicing concern has proved to be fairly effective, mainly because of the authoritarian nature of the political system in China. However, as a double-edged sword, available channels for questioning the legitimacy of formal participation channels provided by the government can also be narrowed down under authoritarian institutions. There is, therefore, a need for a greater diversity of channels of expression such as community workshops and digital participation platforms, to facilitate problem-solving in the implementation and management of low carbon projects.

7 | CONCLUSION

In recent years, environmental authoritarianism seems to be gaining ground in the narratives of climate governance (Beeson, 2010;

Sowers, 2007). Scholars have praised China's efforts in sustainability transitions in relation to actions from renewable energy to flood management, as representing an effective and efficient top-down approach of climate governance. Our study takes a critical view of this opinion. What on the surface appears to be a rare case of community participation in authoritarian China, could also be described as a demonstration of the intricate multilevel sustainability politics that take place in that country. Our case study suggests that participation occurs in China, but not always in the style and models that have been popularized in the environmental and climate governance literature, influenced by cases in global regions generically referred to as the global north. Climate governance in China is the result of multilayered processes of negotiation and conflict, rather than the smooth outcome of top-down regulations.

The case of Qiaoxiang village demonstrates the operation of less visible forms of public participation, which, in this case, we regard as "defensive participation." The case shows how citizens mobilize to intervene in climate governance, particularly when climate governance impacts their everyday experiences. At the local level, defensive participation serves as an essential communication mechanism between citizens and policymakers to ensure that societal needs are addressed and public goods are delivered. Just as other forms of participation, defensive participation can influence policy outcomes and improve the accountability of policymakers. Under the authoritarian institutional system in China, channels for defensive participation are usually limited and highly controlled by the government. However, multi-level governance interactions are diversifying and providing new channels of participation, through for instance, mechanisms for reporting to higher-level authorities. The form of defensive participation uncovered in Qiaoxiang village is an indictment against an uncritical defense of authoritarian approaches to climate governance that focus on short-term outcomes of climate initiatives while neglecting long-lasting post-project interactions among communities.

In different contexts, public participation is also increasingly achieved through a diverse range of creative strategies led by citizens. "Defensive participation" is but one example of the multiple channels whereby Chinese citizens are engaging in climate participation. Defensive participation may also happen at the margins of current governance structures, against state-led designs, and at considerable risks to those who engage in climate governance. However, even if it appears only as a responsive model of governance, these innovative forms of participation have the potential to have a long-lasting impact on the policy context in China. The diverse types of participation emerging in China call for new conceptualizations of public participation in climate governance beyond the West, and the consideration of climate governance approaches that recognize the diversity and creativeness of participation strategies.

ACKNOWLEDGMENTS

We would like to thank Katy Roelich for their valuable comments on an earlier version of this manuscript. The contributions of A.G. were supported by the Centre for Research into Energy Demand Solutions, award EP/R035288/1. J.P. was supported by funding from the Economic



and Social Research Council (ESRC) to the Centre for Climate Change Economics and Policy (CCCEP) (ESRC grant number ES/K006576/1).

ORCID

Ping Huang  <https://orcid.org/0000-0002-7573-715X>

ENDNOTES

¹ The SWH system installed in Qiaoxiang village is actually the solar assisted air source heat pump (SA-ASHP) system. ASHP functions as auxiliary heat source. According to investigation of experts, the noise problem is mainly caused by the ASHP system.

² http://news.ifeng.com/a/20161212/50401283_0.shtml

REFERENCE

- Agyeman, J., Bullard, R. D., & Evans, B. (Eds.). (2003). *Just sustainabilities: Development in an unequal world*. London: The MIT press.
- Andonova, L. B., & Mitchell, R. B. (2010). The rescaling of global environmental politics. *Annual Review of Environment and Resources*, 35, 255–282.
- Bäckstrand, K., & Kuyper, J. W. (2017). The democratic legitimacy of orchestration: The UNFCCC, non-state actors, and transnational climate governance. *Environmental Politics*, 26(4), 764–788.
- Bäckstrand, K., Kuyper, J. W., Linnér, B. O., & Lövbrand, E. (2017). Non-state actors in global climate governance: From Copenhagen to Paris and beyond. *Environmental Politics*, 26(4), 561–579.
- Bailey, I., Gouldson, A., & Newell, P. (2011). Ecological modernisation and the governance of carbon: A critical analysis. *Antipode*, 43(3), 682–703.
- Barbi, F., Ferreira, L. D. C., & Guo, S. (2016). Climate change challenges and China's response: Mitigation and governance. *Journal of Chinese Governance*, 1(2), 324–339.
- Barnes, S., & Kaase, M. (1979). *Political action: Mass participation in five Western democracies*. London & Beverly Hills: Sage.
- Beeson, M. (2010). The coming of environmental authoritarianism. *Environmental Politics*, 19(2), 276–294.
- Betsill, M. M., & Bulkeley, H. (2006). Cities and the multilevel governance of global climate change. *Global Governance*, 12, 141.
- Betsill, M. M., & Rabe, B. G. (2009). Climate change and multilevel governance: The evolving state and local roles. In: D.A. Mazmanian and M.E. Kraft, (eds). *Toward sustainable communities: Transition and transformations in environmental policy*. 2nd ed. Cambridge, Massachusetts: The MIT Press. (pp. 201–225).
- Boyd, E., & Folke, C. (Eds.). (2011). *Adapting institutions: governance, complexity and social-ecological resilience*. New York: Cambridge University Press.
- Bulkeley, H., & Kern, K. (2006). Local government and the governing of climate change in Germany and the UK. *Urban studies*, 43(12), 2237–2259.
- Bulkeley, H., Edwards, G. A., & Fuller, S. (2014). Contesting climate justice in the city: Examining politics and practice in urban climate change experiments. *Global Environmental Change*, 25, 31–40.
- Bulkeley, H., & Newell, P. (2015). *Governing climate change*. 2nd ed. New York: Routledge.
- Bulkeley, H. A., Broto, V. C., & Edwards, G. A. (2014). *An urban politics of climate change: Experimentation and the governing of socio-technical transitions*. New York: Routledge.
- Caprotti, F. (2014). Critical research on eco-cities? A walk through the Sino-Singapore Tianjin Eco-City, China. *Cities*, 36, 10–17.
- Caprotti, F., Springer, C., & Harmer, N. (2015). 'Eco'For whom? Envisioning eco-urbanism in the Sino-Singapore Tianjin eco-city, China. *International Journal of Urban and Regional Research*, 39(3), 495–517.
- Carter, N., & Mol, A. P. (2013). *Environmental governance in China*. London: Routledge.
- Castán Broto, V., Boyd, E., & Ensor, J. (2015). Participatory urban planning for climate change adaptation in coastal cities: Lessons from a pilot experience in Maputo, Mozambique. *Current Opinion in Environmental Sustainability*, 13, 11–18.
- Chambers, R. G., & Foster, W. E. (1983). Participation in the farmer-owned reserve program: a discrete choice model. *American Journal of Agricultural Economics*, 65(1), 120–124.
- Chan, S., van Asselt, H., Hale, T., Abbott, K. W., Beisheim, M., Hoffmann, M., ... Pauw, P. (2015). Reinvigorating international climate policy: A comprehensive framework for effective nonstate action. *Global Policy*, 6(4), 466–473.
- Chen, G. C., & Lees, C. (2016). Growing China's renewables sector: A developmental state approach. *New Political Economy*, 21(6), 574–586.
- Chilvers, J., and Longhurst, N., 2012. Participation, Politics and Actor Dynamics in Low Carbon Energy Transitions-Report of a Transition Pathways Project workshop. Norwich: 3S Research Group.
- Cooke, B., & Kothari, U. (Eds.). (2001). *Participation: The new tyranny?* London: Zed Books.
- Dalton, R. J. (2014). *Citizen politics: Public opinion and political parties in advanced industrial democracies*. Washington: CQ Press.
- Dang, W. (2018). How culture shapes environmental public participation: Case studies of China, The Netherlands, and Italy. *Journal of Chinese Governance*, 1–23. <https://doi.org/10.1080/23812346.2018.1443758>.
- Deng, Y., & Yang, G. (2013). Pollution and protest in China: Environmental mobilization in context. *The China Quarterly*, 214, 321–336.
- Du, Y., Wang, X., Brombal, D., Moriggi, A., Sharpley, A., & Pang, S. (2018). Changes in environmental awareness and its connection to local environmental management in water conservation zones: The case of Beijing, China. *Sustainability*, 10(6), 2087.
- Dumbaugh, K., & Martin, F. (2011). Understanding China's political system. *Current Politics and Economics of South, Southeastern, and Central Asia*, 20(2), 277–312.
- Economic Daily. (2010). *Vigorously promote the use of renewable energy [Accelerating the application of renewable energy]*. 2010-12-24. Available at: http://paper.ce.cn/jjrb/html/2010-12/24/content_131723.htm.
- Emrouznejad, A., Ho, W., Grafakos, S., Flamos, A., Oikonomou, V., & Zevgolis, D. (2010). Multi-criteria analysis weighting methodology to incorporate stakeholders' preferences in energy and climate policy interactions. *International Journal of Energy Sector Management*, 4(3), 434–461.
- Ergenc, C. (2014). Political efficacy through deliberative participation in urban China: A case study on public hearings. *Journal of Chinese Political Science*, 19(2), 191–213.
- Everatt, D., Marais, H., & Dube, N. (2010). Participation... for what purpose? Analysing the depth and quality of public participation in the integrated development planning process in Gauteng. *Politikon*, 37 (2–3), 223–249.
- Falkner, R. (2016). The Paris Agreement and the new logic of international climate politics. *International Affairs*, 92(5), 1107–1125.
- Frantzeskaki, N., Broto, V. C., Coenen, L., & Loorbach, D. (Eds.). (2016). *Urban sustainability transitions*. London: Routledge.
- Geall, S., & Hilton, I. (2014). China's environmental governance challenge. In *State of the World 2014* (pp. 129–137). Washington, DC: Island press.
- Gilley, B. (2012). Authoritarian environmentalism and China's response to climate change. *Environmental Politics*, 21(2), 287–307.
- Glasbergen, P. (Ed.). (1998). *Co-operative environmental governance: public-private agreements as a policy strategy*. Dordrecht: Kluwer Academic Publishers.
- Guo, B. (2003). Political legitimacy and China's transition. *Journal of Chinese Political Science*, 8(1–2), 1–25.

- Hale, T. (2016). "All hands on deck": The Paris agreement and nonstate climate action. *Global Environmental Politics*, 16(3), 12–22.
- Han, H., & Gao, Q. (2019). Community-based welfare targeting and political elite capture: Evidence from rural China. *World Development*, 115, 145–159.
- Han, H., Swedlow, B., & Unger, D. (2014). Policy advocacy coalitions as causes of policy change in China? Analyzing evidence from contemporary environmental politics. *Journal of Comparative Policy Analysis: Research and Practice*, 16(4), 313–334.
- HCBSM (Housing and Construction Bureau of Shenzhen Municipality, Shenzhen), 2014. Notice on Adjusting the Working Plan on the Application of Solar Thermal Technology in Buildings. Available from http://www.szjs.gov.cn/csml/bgs/xxgk/tzgg_1/201412/t20141217_2760579.htm. (in Chinese)
- HCBSM (Housing and Construction Bureau of Shenzhen Municipality, Shenzhen), 2015. Notice on Terminating the Acceptance of Application of Subsidy for the Solar Rooftop Project. Available from http://www.szjs.gov.cn/csml/bgs/xxgk/tzgg_1/201505/t20150520_2880386.htm. (in Chinese)
- He, B., & Warren, M. E. (2011). Authoritarian deliberation: The deliberative turn in Chinese political development. *Perspectives on Politics*, 9(2), 269–289.
- Heilmann, S. (2008). From local experiments to national policy: The origins of China's distinctive policy process. *The China Journal*, 59, 1–30.
- Hickey, S., & Mohan, G. (2004). *Participation - from tyranny to transformation?: Exploring new approaches to participation in development*. New York: Zed books.
- Ho, P. (2007). Embedded activism and political change in a semi-authoritarian context. *China Information*, 21(2), 187–209.
- Hochstetler, K., & Kostka, G. (2015). Wind and solar power in Brazil and China: Interests, state–business relations, and policy outcomes. *Global Environmental Politics*, 15(3), 74–94.
- Hoffmann, M. J. (2011). *Climate governance at the crossroads: Experimenting with a global response after Kyoto*. New York: Oxford University Press.
- Huang, P., Castán Broto, V., Liu, Y., & Ma, H. (2018). The governance of urban energy transitions: A comparative study of solar water heating systems in two Chinese cities. *Journal of Cleaner Production*, 180, 222–231.
- Kapoor, I. (2001). Towards participatory environmental management? *Journal of Environmental Management*, 63(3), 269–279.
- Klenk, N. L., Meehan, K., Pinel, S. L., Mendez, F., Lima, P. T., & Kammen, D. M. (2015). Stakeholders in climate science: Beyond lip service? *Science*, 350(6262), 743–744.
- Khanna, N., Fridley, D., & Hong, L. (2014). China's pilot low-carbon city initiative: A comparative assessment of national goals and local plans. *Sustainable Cities and Society*, 12, 110–121.
- Konidari, P., & Mavrakis, D. (2007). A multi-criteria evaluation method for climate change mitigation policy instruments. *Energy Policy*, 35(12), 6235–6257.
- Kundu, D. (2011). Elite capture in participatory urban governance. *Economic and Political Weekly*, 46(10), 23–25.
- Leib, E., & He, B. (Eds.). (2006). *The search for deliberative democracy in China*. New York: Palgrave Macmillan.
- Lewis, J. I. (2012). *Green innovation in China: China's wind power industry and the global transition to a low-carbon economy*. New York: Columbia University Press.
- Li, B. (2013). Governing urban climate change adaptation in China. *Environment and Urbanization*, 25(2), 413–427.
- Lieberthal, K., & Lampton, D. M. (Eds.). (1992). *Bureaucracy, politics, and decision making in post-Mao China*. Berkeley and Los Angeles: University of California Press.
- Liu, L., Wang, P., & Wu, T. (2017). The role of nongovernmental organizations in China's climate change governance. *Wiley Interdisciplinary Reviews: Climate Change*, 8(6), e483.
- Lo, A. Y. (2013). Carbon trading in a socialist market economy: Can China make a difference? *Ecological Economics*, 87, 72–84.
- Lo, A. Y., & Howes, M. (2013). Powered by the state or finance? The organization of China's carbon markets. *Eurasian Geography and Economics*, 54(4), 386–408.
- Lo, K., Li, H., & Chen, K. (2020). Climate experimentation and the limits of top-down control: Local variation of climate pilots in China. *Journal of Environmental Planning and Management*, 63(1), 109–126.
- Lund, J. F., & Saito-Jensen, M. (2013). Revisiting the issue of elite capture of participatory initiatives. *World Development*, 46, 104–112.
- Mai, Q., & Francesch-Huidobro, M. (2014). *Climate change governance in Chinese cities*. New York: Routledge.
- Martens, S. (2006). Public participation with Chinese characteristics: Citizen consumers in China's environmental management. *Environmental Politics*, 15(02), 211–230.
- Meadow, A. M., Ferguson, D. B., Guido, Z., Horangic, A., Owen, G., & Wall, T. (2015). Moving toward the deliberate coproduction of climate science knowledge. *Weather, Climate, and Society*, 7(2), 179–191.
- Meidan, M., Andrews-Speed, P., & Xin, M. (2009). Shaping China's energy policy: Actors and processes. *Journal of Contemporary China*, 18(61), 591–616.
- Mendonça, M., Lacey, S., & Hvelplund, F. (2009). Stability, participation and transparency in renewable energy policy: Lessons from Denmark and the United States. *Policy and Society*, 27(4), 379–398.
- Mertha, A. C. (2014). *China's water warriors: Citizen action and policy change*. New York: Cornell University Press.
- Minchun, Z., & Bao, Z. (2012). Specialised environmental courts in China: Status quo, challenges and responses. *Journal of Energy & Natural Resources law*, 30(4), 361–390. <https://doi.org/10.1080/02646811.2012.11435303>
- Mol, A. P. (2015). China's transition to sustainability. Which direction to take. *Routledge International Handbook of Sustainable Development*, New York: Routledge. pp. 351–363.
- Nasiritousi, N., Hjerpe, M., & Linnér, B. O. (2016). The roles of non-state actors in climate change governance: Understanding agency through governance profiles. *International Environmental Agreements: Politics, Law and Economics*, 16(1), 109–126.
- NDRC (National Development and Reform Commission of China), 2015. China's Intended Nationally Determined Contribution Document. Available from <https://www4.unfccc.int/sites/submissions/INDC/Published%20Documents/China/1/China's%20INDC%20-%20on%2030%20June%202015.pdf>
- Newell, P. (2008). Civil society, corporate accountability and the politics of climate change. *Global Environmental Politics*, 8(3), 122–153.
- Newell, P., Bulkeley, H., Turner, K., Shaw, C., Caney, S., Shove, E., & Pidgeon, N. (2015). Governance traps in climate change politics: Reframing the debate in terms of responsibilities and rights. *Wiley Interdisciplinary Reviews: Climate Change*, 6(6), 535–540.
- Norris, P. (2002). *Democratic Phoenix: Reinventing political activism*. Cambridge: Cambridge University Press.
- Nour, A. M. (2011). Challenges and advantages of community participation as an approach for sustainable urban development in Egypt. *Journal of Sustainable Development*, 4(1), 79.
- Okereke, C., Bulkeley, H., & Schroeder, H. (2009). Conceptualizing climate governance beyond the international regime. *Global Environmental Politics*, 9(1), 58–78.
- Otsuki, K. (2016). Infrastructure in informal settlements: Co-production of public services for inclusive governance. *Local Environment*, 21(12), 1557–1572.
- Pallett, H., Chilvers, J., & Hargreaves, T. (2019). Mapping participation: A systematic analysis of diverse public participation in the UK energy system. *Environment and Planning E: Nature and Space*, 2(3), 590–616.
- Palumbo, A. (2017). Introduction. In R. Bellamy & A. Palumbo (Eds.), *Political accountability*. New York: Routledge.



- Paterson, M. (2014). *Climate re-public: Practicing public space in conditions of extreme complexity*. The return of the public in global governance. - New York: Cambridge University Press. (p.149).
- Pattberg, P., & Widerberg, O. (2015). Theorising global environmental governance: Key findings and future questions. *Millennium*, 43(2), 684–705.
- Persha, L., & Andersson, K. (2014). Elite capture risk and mitigation in decentralized forest governance regimes. *Global Environmental Change*, 24, 265–276.
- Qi, Y., & Zhang, L. (2014). Local environmental enforcement constrained by central-local relations in China. *Environmental Policy and Governance*, 24(3), 216–232.
- Rigon, A. (2014). Building local governance: Participation and elite capture in slum-upgrading in Kenya. *Development and Change*, 45(2), 257–283.
- SBSM (Statistics Bureau of Shenzhen Municipality). (2018). *Statistical communique of Shenzhen's economic and social development (2017) [Shenzhen shi 2018 nian guomin jingji he shehui fazhan tongji gongbao] (in Chinese)*. Shenzhen: Statistics Bureau of Shenzhen Municipality.
- Schlosberg, D., & Carruthers, D. (2010). Indigenous struggles, environmental justice, and community capabilities. *Global Environmental Politics*, 10(4), 12–35.
- Schreurs, M. (2017). Multi-level climate governance in China. *Environmental Policy and Governance*, 27(2), 163–174.
- Schroeder, H., & Lovell, H. (2012). The role of non-nation-state actors and side events in the international climate negotiations. *Climate Policy*, 12(1), 23–37.
- Schroeder, M. (2008). The construction of China's climate politics: Transnational NGOs and the spiral model of international relations. *Cambridge Review of International Affairs*, 21(4), 505–525.
- Seeger, A., & Bennett, W. L. (2011). Social media and the organization of collective action: Using twitter to explore the ecologies of two climate change protests. *The Communication Review*, 14(3), 197–215.
- Shen, W. (2017). Who drives China's renewable energy policies? Understanding the role of industrial corporations. *Environmental Development*, 21, 87–97.
- Shen, W., & Xie, L. (2018). The political economy for low-carbon energy transition in China: Towards a new policy paradigm? *New Political Economy*, 23(4), 407–421.
- Shenzhen Evening News., 2006 Shenzhen has applied to be the demonstration city for solar building integration. Available from <http://news.sina.com.cn/c/2006-01-14/15567983726s.shtml> (in Chinese)
- Shenzhen Special Zone Daily., 2016a. The solar water heating system in Qiaoxiang village will be transformed. Available from http://sztqb.sznews.com/html/2016-05/07/content_3519153.htm?v=pc (in Chinese)
- Shenzhen Special Zone Daily., 2016b. The solar water heating system in Qiaoxiang village will be retained and transformed. Available from http://sztqb.sznews.com/html/2016-09/02/content_3610299.htm (in Chinese)
- Sovacool, B. K. (2013). Energy policymaking in Denmark: Implications for global energy security and sustainability. *Energy Policy*, 61, 829–839.
- Sowers, J. (2007). Nature reserves and authoritarian rule in Egypt: Embedded autonomy revisited. *The Journal of Environment & Development*, 16(4), 375–397.
- Stagl, S. (2006). Multicriteria evaluation and public participation: The case of UK energy policy. *Land Use Policy*, 23(1), 53–62.
- Standing Committee of the Shenzhen Municipal People's Congress (SCSMPC). (2006). Regulations of Shenzhen Special Economic Zone on Building Energy Efficiency [Building Energy Efficiency Regulation in Shenzhen]. Available at: http://www.szjs.gov.cn/csml/zcfg/xxgk/zcfg_1/jngl/201212/t20121205_2083269.htm.
- Su, F., & Yang, D. (2005). Elections, governance, and accountability in rural China. *Asian Perspective*, 29(4), 125–157.
- Sun, Y. (2016). The changing role of China in global environmental governance. *Rising Powers Quarterly*, 1(1), 43–53.
- Tang, B. (2014). Development and prospects of deliberative democracy in China: The dimensions of deliberative capacity building. *Journal of Chinese Political Science*, 19(2), 115–132.
- Tanner, T., Mitchell, T., Polack, E., & Guenther, B. (2009). Urban governance for adaptation: Assessing climate change resilience in ten Asian cities. *IDS Working Papers*, 2009(315), 01–47.
- Tian, T., Speelman, S., & Zuo, T. (2019). From elite capture to marginalization of the poorest: A new social exclusion in anti-poverty programmes in China. *Journal of Chinese Economics and Business Studies*, 17(1), 91–102.
- Tsai, L. L. (2007). Solidary groups, informal accountability, and local public goods provision in rural China. *American Political Science Review*, 101(2), 355–372.
- Tsang, S., & Kolk, A. (2010). The evolution of Chinese policies and governance structures on environment, energy and climate. *Environmental Policy and Governance*, 20(3), 180–196.
- Urban, F. (2018). China's rise: Challenging the north-south technology transfer paradigm for climate change mitigation and low carbon energy. *Energy Policy*, 113, 320–330.
- van Buuren, A., Driessen, P., Teisman, G., & van Rijswijk, M. (2014). Toward legitimate governance strategies for climate adaptation in The Netherlands: Combining insights from a legal, planning, and network perspective. *Regional Environmental Change*, 14(3), 1021–1033.
- Van Rooij, B. (2014). Regulation by escalation: unrest, lawmaking and law enforcement in China. In S. Trevaskes, et al., (eds). *The Politics of Law and Stability in China*. Cheltenham: Edward Elgar Publishing.
- Verba, S., Nie, N. H., & Kim, J.-O. (1972). *Participation and political equality: A seven-nation comparison*. Chicago: Chicago University Press.
- Wagner, L., & Minca, C. (2014). Rabat retrospective: Colonial heritage in a Moroccan urban laboratory. *Urban Studies*, 51(14), 3011–3025.
- Wang, Y., Sun, M., Yang, X., & Yuan, X. (2016). Public awareness and willingness to pay for tackling smog pollution in China: A case study. *Journal of Cleaner Production*, 112, 1627–1634.
- Watson, J. J., & Hudson, M. D. (2015). Regional scale wind farm and solar farm suitability assessment using GIS-assisted multi-criteria evaluation. *Landscape and Urban Planning*, 138, 20–31.
- Weale, A. (1999). Participation and representation. In *Democracy* (pp. 84–105). London: Palgrave.
- Westman, L.K., Castán Broto, V., & Huang, P. (2019). Revisiting multi-level governance theory: Politics and innovation in the urban climate transition in Rizhao, China. *Political Geography*, 70, 14–23.
- Wilmsen, B. (2016). Expanding capitalism in rural China through land acquisition and land reforms. *Journal of Contemporary China*, 25(101), 701–717.
- Wu, L., Qian, H., & Li, J. (2014). Advancing the experiment to reality: Perspectives on Shanghai pilot carbon emissions trading scheme. *Energy Policy*, 75, 22–30.
- Xu, Q. (2007). Community participation in urban China: Identifying mobilization factors. *Nonprofit and Voluntary Sector Quarterly*, 36(4), 622–642.
- Young, I. M. (2011). *Justice and the politics of difference*. Princeton: Princeton University Press.
- Zhan, X., & Tang, S. Y. (2013). Political opportunities, resource constraints and policy advocacy of environmental NGOs in China. *Public Administration*, 91(2), 381–399.
- Zhou, W. (2012). In search of deliberative democracy in China. *Journal of Public Deliberation*, 8(1), 8.

How to cite this article: Huang P, Castán Broto V, Westman LK. Emerging dynamics of public participation in climate governance: A case study of solar energy application in Shenzhen, China. *Env Pol Gov*. 2020;30:306–318. <https://doi.org/10.1002/eet.1886>