Contesting climate justice in the city: Examining politics and practice in urban climate change experiments

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ABSTRACT

Debates about climate justice have mainly occurred at the international scale, and have focussed on the rights and responsibilities of nation-states to either be protected from the effects of climate change, or to take action to reduce emissions or support adaptation. In this paper, we argue that it is both productive and necessary to examine how climate justice is being pursued at the urban scale, which brings into focus the need for attention to issues of recognition as well as rights and responsibilities. Building on work from environmental justice, which has conceptualized justice as trivalent, we propose that climate justice can be understood as a pyramid, the faces of which are distributions, procedures, rights, responsibilities and recognition. We then apply this conceptual framework to examine climate change interventions in five cities; Bangalore, Monterrey, Hong Kong, Philadelphia and Berlin. Arguing that the politics and practices of urban climate change interventions are constantly engaging with and refracting the idea of justice, we examine how justice was articulated, practiced and contested across our cases. The perspective of recognition emerges as a particularly useful entry point through which to explore the types of rights, responsibilities, distributions and procedures required to respond justly to climate change. We conclude by reflecting on our framework, arguing that it is useful both as an analytical device to interrogate climate justice and to shape the design of climate change interventions which seek to ensure climate justice.

1. Introduction

Over the past two decades, scholars from a range of disciplinary backgrounds have become increasingly interested in the urban governance of climate change. Initial accounts which documented and described how cities were responding to climate change have given way to an increasingly diverse and sophisticated body of work. The literature now considers the different forms of governance architecture (multilevel, transnational) through which urban responses are being conducted, is cognisant of the multiplicity of actors and forms of authority at work in the city, and has moved beyond a focus on mitigation to also consider forms of adaptation in the urban arena (for a review, see Bulkeley, 2010). Yet despite the parallel expansion in scholarship which has examined questions of climate justice at the international scale, to date there has been relatively little scholarship that has considered questions of climate justice at the scale of the city. In this paper we

build upon our previous work (Bulkeley et al., 2013) to argue for the need to develop a new account of climate justice as an urban concern that can move beyond principles specifying fair distributions of rights and responsibilities and the procedural requirements for participation in and access to decision-making, but which also entails 'recognition' of existing forms of inequality and the ways in which climate change interventions might serve to either exacerbate or redress these underlying structural issues (Fraser, 1997, 2009).

To this end, in the first part of the paper we examine how climate justice has been framed in scholarship focussed on international-scale climate governance, arguing that it can be conceptualized as a two dimensional model built around the axes of distribution/procedure and rights/responsibilities. We then introduce the notion of justice as recognition (Fraser, 1997), drawing on environmental justice scholarship which has argued for a multivalent conception of justice. We conceptualize climate justice as a three dimensional pyramid, which we argue better captures the multidimensional nature of what a just response to climate change might entail. We see this climate justice pyramid as diagnostic rather than prescriptive, arguing that it better captures the interdependency of distribution, procedure, rights, responsibilities and recognition,

which are all facets of climate justice, and suggest the pyramid is useful both as a conceptual framework to unpack climate justice and as an analytical tool through which to shape the design of new forms of intervention.

In attending to the multiple dimensions of urban climate justice, our paper eschews normative judgements about policy design or intervention in favour of understanding how notions of justice (variously referred to as fairness, equity, inequality, participation, legitimacy and so on) are being deployed and contested in the politics and day-to-day practices of urban responses to climate change. In other words, we suggest that urban responses to climate change are *always* and *already* engaging notions of justice, and that these engagements are critical to the ways in which they come to have effect and are contested. Importantly, given the multiplicity of actors involved in governing urban climate change responses in the city, this means that the articulation and extension of climate justice exceeds the formal arena of municipal actors and policymaking, raising questions about and who stands to gain and lose through such processes. In the second part of the paper, we illustrate the utility of this approach by applying it to examine how notions of climate justice have been framed and enacted through responses taking place in Bangalore, Monterrey, Hong Kong, Philadelphia and Berlin. We find that justice was framed predominantly in terms of responsibilities in Bangalore and Hong Kong, and predominantly in terms of rights in Monterrey, Philadelphia and Berlin. Recognition emerged in different forms and to different degrees across the interventions, but it was particularly clear that lack of recognition underpinned the lack of impact of Berlin's Solar Atlas. We conclude by reflecting on the implications of our framework both for the analytics of climate justice and for shaping the design of climate change interventions which seek to ensure climate justice.

2. Retheorizing climate justice at the urban scale

The existing debate on climate justice, primarily concerned with the politics of international agreements, has focussed on a two-dimensional conception of climate justice which frames justice in terms of rights and responsibilities to act on climate change within a predominantly distributive mindset, albeit one engaged with procedural justice. A fundamental weakness of this approach has been its assumption that nation-states are the relevant actor, with the effect that structural patterns of inequality *within* nations have tended to be overlooked. Below, we examine how adopting an urban lens brings this issue sharply to the fore, and argue that such an urban lens demands engagement with post-distributive notions of justice. We argue that climate justice must engage with the idea of justice as recognition in addition to existing framings in terms of rights and responsibilities. Drawing in part on the ways environmental justice theorists have engaged with recognition, we suggest that climate justice must be conceptualized in three dimensions, where questions of rights, responsibilities and recognition are essential but necessarily interdependent facets of justice in both its distributive and procedural forms.

2.1. From international principles to urban politics

At both international and national levels, justice has predominantly been framed in terms of the distribution of 'rights' and 'responsibilities': for instance who has the right to emit greenhouse gases and at what level, and whose responsibility it is to ameliorate climate change by reducing emissions. More recently, as the need for climate change adaptation has been included within international, national and local policy discourse, this rights/responsibilities framing of the justice debate has been

extended to include the right to be protected from (dangerous) climate change and the responsibility to provide compensation (through, for example, climate change adaptation funding) for potential harm. In both cases, the scale at which justice is framed has been inter*national*, in terms of focusing on the nation-state as the locus and arbiter of rights and responsibilities, and inter*generational*, in terms of considering implications for actions across different generations (Gardiner, 2004; Paavola and Adger, 2006; Page, 2006, 2008; Roberts and Parks, 2007). While there has been broad acceptance of the principle that those with (most) responsibility for climate change should act first, the international agreements in this policy domain testify to the difficulty of operationalizing this principle. The kinds of greenhouse gas emissions involved, what might constitute necessary uses of energy or other greenhouse gas-related activities, and the time-scales over which such calculations should be made are just some of the multiple confounding factors already encountered at the international scale (Füssel, 2010). In the adaptation arena, such challenges are made more complex by the uneven and uncertain geographies of both risk and culpability which play out not only in terms of who should bear the burden of any adaptation measure but where and for whom benefits from adaptation should be realised (Bulkeley et al., 2013). If responding to climate change consists of two basic duties of mitigation and adaptation (Caney, 2010), deciding on who has responsibility for fulfilling these duties is highly contested. Indeed, it is in this context that procedural justice considerations have been most notable, due to their importance for ensuring legitimacy in the absence of distributive consensus. What is clear, though, is that at the international scale achieving justice is seen as an exercise in balancing rights and responsibilities through distributive and/or procedural mechanisms. We might conceptualize this approach to justice as a Cartesian plane (Fig. 1).

Note, however, that on this plane the subject of justice is never specified. This is at least in part because, fraught and contested as they undoubtedly are, the international debates share a common assumption that the nation-state is the relevant actor to which responsibilities and rights accrue. However, other accounts have focused on individuals as the subjects to which considerations of justice should be applied. For instance Harris (2010a,b) argues that the notion of international justice must be replaced with that of cosmopolitan justice where responsibility for emissions accrues to 'people' rather than states, precisely to overcome what he identifies as a misalignment between the political geography of climate change and its environmental geography. Harris' observation is astute, because it correctly draws our attention to a whole constituency (rich people in the global South) which is currently
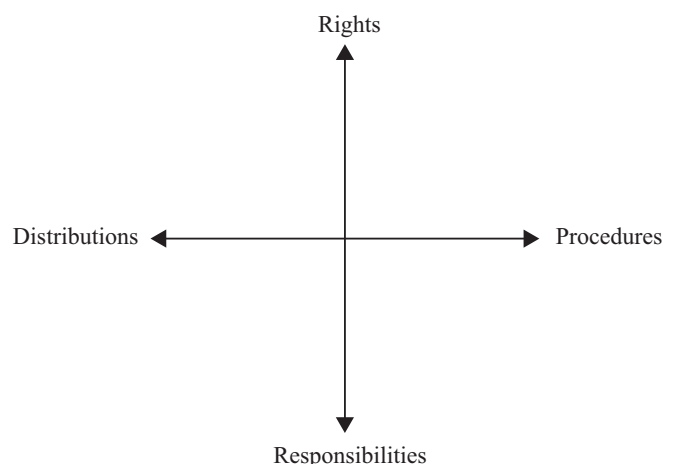

Fig. 1. The conventional two-dimensional conceptualization of climate justice.

ignored in the international debates about climate justice; whose rights and responsibilities should differ substantively from the broader rights and responsibilities of the nations in which they live. Extending Harris' argument, it is clear that we must also remain attentive to actors at a range of scales with equally diverse rights and responsibilities, not just nation-states or individuals. These actors include communities, non-governmental organizations, private sector corporations, and sub-national governments.

If we extend Harris' argument explicitly to the urban scale, the social and geographical complexity of greenhouse gas emission production, climate impacts, vulnerability and adaptive capacity points to the need to engage with two critical issues. Firstly, it is clear that cities as actors may have differential responsibilities (and, by extension, rights) to those of the nation-states within which they are located. Arguably, for example, the relatively low per capita emissions of some cities compared to others calls for national (and even international) policies and measures that are able to take this into account. Secondly, looking within cities, there are likely to be important forms of difference in terms of where the duties, burdens and benefits of addressing climate change could and should lie (Bulkeley et al., 2013). Applying principles of justice to the development and analysis of urban responses to climate change therefore requires a nuanced engagement with how climate change action creates both costs and benefits, which are unevenly experienced across cities. In short, it involves engaging substantively with the notion of justice as *recognition*, which views socio-economic (i.e. distributive) injustices as fundamentally linked to "cultural or symbolic injustices" which fail to give adequate recognition to certain groups (such as women, the working class, or particular racial or ethnic groups) (Fraser, 1997, p. 14). In cities, taking account of recognition means moving beyond simplistic assumptions concerning (for example) the 'shared responsibilities' of any one urban community in response to climate change, or the 'needs' of particular parts of cities to be afforded protection from the impacts of climate change. It means examining how both the practice and politics of climate change action refracts justice.

2.2. Recognition as a lens for examining the urban politics of climate justice

There is broad acceptance at the international scale that pre-existing structural conditions (historical patterns of 'development' being the prime example) are key determinants of the relative rights and responsibilities of nation-states *vis-à-vis* climate change mitigation and adaptation (Caney, 2005, 2010). However, solutions have primarily been framed in terms of relative targets established for emissions reductions and through the provision of financial and technical assistance. Indeed, it is testament to the challenges that addressing such forms of inequity involve that it has been over these matters that some of the most protracted debates within the climate change negotiations have taken place (Grubb, 1995; Okereke and Dooley, 2010). At the urban scale, similarly, both urban political ecologists and environmental justice scholars have been instrumental in showing how the positive and negative effects of socio-environmental processes are highly unevenly distributed across the city (Agyeman, 2005; Agyeman et al., 2009; Pellow, 2004; Swyngedouw, 2004). The urban scale brings into particularly sharp focus the ways in which inequalities are created and sustained by the same social, political and economic processes which determine what 'fairness' means. In this context, it is clear that traditional framings of justice as a matter of ensuring 'fair' distribution of resources or access to decision making processes are captive to the contexts in which they are created, suggesting different questions need to be asked. It becomes important, for

instance, to establish whether interventions in the name of climate change serve to maintain the interests of an elite at the expense of a minority, and as such perpetuate patterns of inequality in the city, or whether they are instead able to shift the terms of debate, make space for alternatives, and address existing forms of inequality (see, for instance Heynen, 2013; London et al., 2013; Sze and London, 2008). As Fraser (1997, p. 12) put it, "justice today requires *both* redistribution and recognition", and in this context, we argue that rather than confine analysis to the principles by which climate justice might operate, it is vital to examine empirically the processes which structure urban political economies, the relations of power within them, and the opportunities for contesting existing responses and developing alternatives.

The need to develop the conceptualization of justice with reference to recognition has been increasingly recognized across a body of scholarship on environmental justice. While early work in this field adopted a primarily liberal distributional definition of justice (Swyngedouw and Heynen, 2003; Walker, 2009b), more nuanced theorizations of justice have recently emerged. This has notably included work where the focus was on the city, such as work by Pellow (2004) and Agyeman (2005) and which draws on aspects of recognition theory without explicitly framing their analysis in such terms. Schlosberg (2004) brought such analysis together in a coherent theoretical framework, arguing that "a thorough notion of global environmental justice needs to be locally grounded, theoretically broad, and plural—encompassing issues of recognition, distribution, and participation" (p. 518). Schlosberg's trivalent conception of justice, requiring simultaneous attention to distribution, procedure and recognition as three facets of a rounded conception of justice, has become widely accepted in the literature (e.g. Agyeman, 2005; Martin, 2013; Reed and George, 2011; Sze and London, 2008; Walker, 2009a). Walker and Day, for instance, conceptualize fuel poverty in the UK as an outcome of distributional, procedural and recognition-based injustices, and argue that "procedure and recognition can each be seen as both a component and a condition of justice; separate forms and experiences of injustice in themselves, but deeply tied to distributional inequalities" (2012, p. 70). This insistence on the trivalence of justice, and the consequent need to constantly contextualize recognition with procedural and distributional questions, has allowed environmental justice theorists to avoid the pitfalls of overplaying the importance of recognition relative to other facets of justice (discussed in some detail in Fraser, 2000; see also Fraser and Honneth, 2003; Honneth, 2004). Increasingly, it has also become intertwined with a normative shift away from a Rawlsian notion of justice (which judges justice in terms of the distribution of primary goods) towards a 'capabilities approach' to justice (after Sen, 2009) which judges justice in terms of people's capabilities to achieve functionings which they value (Schlosberg, 2013; Walker and Day, 2012). This literature draws predominantly on Fraser's approach to justice as recognition which sees redistribution and recognition as constitutive parts of a framework of justice which is based around the notion of participatory equality. For this reason, we take Fraser's definition as our working definition in this paper. However, it is important to note that this approach has been critiqued, including by Honneth (2004), who argues that justice as recognition is fundamentally about facilitating individual autonomy rather than participatory equality, and Young (1997), who argues that it creates too clear a demarcation between cultural and economic injustice.

Our concern here is not to develop a normative agenda, but rather to argue that engaging with the principle of recognition provides a critical means through which to analyze the ways in which processes of urban development serve to produce forms of social, political and economic inequality, on the one hand, and contribute to creating forms of vulnerability and greenhouse gas
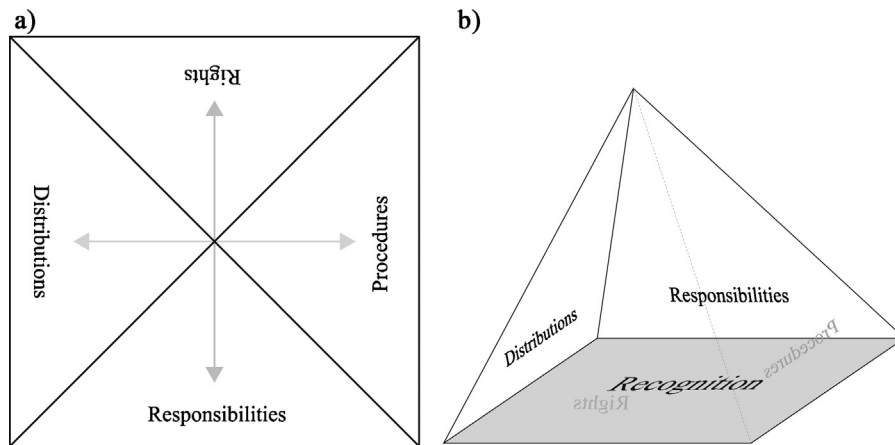
Fig. 2. The three-dimensional climate justice pyramid as viewed from (a) directly above; and (b) obliquely below.

emissions on the other. In this sense, climate change is not simply happening *to* cities, but rather is being produced through the city and in turn serving to reproduce or challenge existing forms of uneven development and urban inequality. Rather than conceptualizing climate justice as a plane, we propose that it should be conceptualized as a pyramid, where distributions, procedures, rights and responsibilities form the four triangular faces, and recognition forms the square bottom face (Fig. 2).

Viewed from above, the pyramid (Fig. 2a) gives us the conventional, international approach to climate justice (Fig. 1). The missing facet of recognition moves our perspective into three dimensions (Fig. 2b), illustrating the ways in which each facet of justice is bound to each of the others. Viewed as a prism, each facet of justice in the pyramid is filtered through the others, refracting and reconfiguring what it is that justice entails in any one context. Rather than simply adding one dimension of justice to another, this conceptualization suggests that each must be considered in relation to one another. We find visualizing climate justice as a pyramid particularly useful because it provides a metaphor of the connections between different facets of justice where each is connected to all the others, and the viewpoint from one facet—one side of the pyramid—is always necessarily refracted through the others, even where this goes unnoticed. Like the environmental justice literature, our climate justice pyramid emphasizes the multivalence of justice (Schlosberg, 2007). But it also challenges environmental justice theorists to consider the rights and responsibilities justice demands, not just distributions and procedures and recognition. Furthermore, and we think most importantly, conceptualizing climate justice as a three-dimensional pyramid challenges us to focus on analysing how climate justice is (and is not) being pursued and realized in practice, because as entry points through the pyramid, the politics and practices of urban climate change interventions are constantly engaging with and refracting the idea of justice.

In the remainder of this paper, we therefore shift our attention to examining how justice has been framed and shaped with reference to interventions designed to respond to climate change in five different cities. This necessarily involves a degree of analytical simplification, separating out the facets of climate justice despite the fact that it is clear from Fig. 2 that we think they are essentially intertwined. We structure our discussion around what we learn from such interventions about 'responsibilities', 'rights', and 'recognition' (building on the international climate justice literature) though the distributional and procedural dimensions of justice remain important considerations. In doing so, we hope to highlight the utility of our framework for developing an understanding of what climate justice means and how it is currently being pursued at the scale of the city.

3. Climate justice and the practice of urban climate change experiments

Urban responses to climate change take multiple forms, from the work of transnational organizations and networks, the individual policy and plans of municipal authorities, to a panoply of initiatives and interventions undertaken by a vast array of state and non-state actors (Bulkeley and Castán Broto, 2013; Hodson and Marvin, 2010; Newell et al., 2012). For the most part, research has sought to examine how and why cities are responding to climate change by focusing on either the ways in which this has been organized transnationally or by interrogating the successes (and failures) of municipal policies. Less attention has been directed towards understanding the interventions or 'experiments' through which climate change responses are being organized and pursued. Given both the wealth of urban responses to climate change that take this form of intervention, and the multiplicity of actors involved, not all of whom might be held to public account for their actions, we suggest that it is critical to examine and assess their implications in relation to notions of climate justice. Below, we first introduce the five cases of such forms of experimental intervention upon which our analysis is based and the methodological approach adopted in this study, before turning to examine how different frames of climate justice were mobilized in each case. We focus our discussion in terms of what studying urban climate change experiments reveals about how responsibilities, rights and recognition are emerging as different facets of what constitutes climate justice, since the international literature has overwhelmingly focussed on the first two and the EJ literature on the third and we are seeking to bring these into dialogue. However, in keeping with the multivalent approach to climate justice we adopt, throughout this discussion we consider the ways in which facets of distributional and procedural justice are formed and refracted through these lenses.

3.1. Researching climate change experiments in global cities

Each of the five cases discussed here formed part of a broader project that sought to examine the ways in which interventions, projects or 'experiments' were emerging in cities as a means through which to address climate change. From an initial survey, over 600 projects were identified in 100 global cities (Castán Broto and Bulkeley, 2013a). Five cases were selected for in-depth qualitative research. The cases were chosen to represent a variety

Table 1
Key information about the experiments.

City	Experiment	Sectors	Type of project	Actors involved	Key objectives
Bangalore	T-Zed	Housing	Zero-carbon housing development	Biodiversity Conservation International, a private housing developer.	Demonstrate the potential for creating a low carbon housing development that did not compromise lifestyle choice Secure energy and water resources for urban development
Monterrey	ViDA	Housing	Low-carbon social housing development	Instituto de la Vivienda de Nuevo Leon, the state-based housing developer; National Housing Commission (CONAVI); INFONAVIT, a federal institute that provides mortgages for workers' housing	Provide housing at low cost that would reduce resource use and running costs over its lifetime Trial the development of a 'green mortgage' scheme
Hong Kong	Climateers; PowerSmart	Energy	Behaviour change	WWF Hong Kong; FoE Hong Kong; HSBC; Community-based organizations; Hong Kong Environmental Planning Department	Develop public momentum for policy response to climate change Create tools and techniques to encourage reduction of household energy consumption
Philadelphia	Coolest Block Contest	Housing	Competition	Energy Coordinating Agency, an NGO; Dow Chemical Company; Mayor's Office of Sustainability	Promote take-up of energy efficiency improvements Create a partnership between public and private actors in the city
Berlin	Solar Atlas	Energy	Online map	Berlin Senate; Berlin Partner (PR arm of the government); virtualcitySYSTEMS (for delivery)	Encourage home-owners to investigate installing solar systems Position Berlin as a 'green' city

of urban contexts in the Global South and North across different world regions and forms of intervention that were predominantly concerned with either housing or energy, as these are the most frequent urban responses captured in the initial survey. Practical considerations, including the working languages of the projects, the ability to gain sufficient access and the financial resources required to conduct the fieldwork were then used to select the cases. A summary of the five projects is provided in Table 1.

The case-study research was conducted between March 2010 and May 2012. Each case utilized a similar methodology, starting with documentary analysis and then supplemented with semi-structured field-based interviews, predominantly with elites from the public sector, industry and the non-profit sector but also including interviews with participants and site visits where possible. A total of 117 interviews were conducted across the five case studies, 47 in Bangalore, 31 in Monterrey, 23 in Hong Kong, 28 in Philadelphia and 18 in Berlin. Interviews were predominantly conducted in an office environment with an interview guide, and they were taped, and subsequently transcribed and coded using a guide created iteratively through the development of the conceptual framework of the project and the field research. In a few cases, only informal meetings were possible due to time or personal constraints and on these occasions notes were taken by hand and fed into the thinking and coding used for analysing other interviews. The analysis also examined a range of written sources including, for example, promotional materials, government press releases, newspaper articles, discussion articles in architectural blogs and forums and academic presentations.

3.2. Creating carbon responsibilities in the city

The experiments in both Bangalore (T-Zed) and Hong Kong (Climateers and PowerSmart) have actively sought to create new forms of responsibility in relation to climate change. Across multiple policy domains, scholars from the governmentality tradition have pointed to the advent of discourses and practices as signifying forms of 'advanced liberal government'. Where governing is seen to be accomplished through the conduct of conduct, forms of 'self-government' become critical as "subjects are responsibilized and given autonomy to act" in a manner consistent with such rationalities (Lockwood and Davidson, 2010, p. 394). Responsible citizens and consumers—those that may, for example, seek to manage their own carbon (Paterson and Stripple, 2010)—are charged with not only following government directives, but also seeking to establish and enact their own norms of self-conduct which enable them to participate in contemporary society. It is, therefore, perhaps unsurprising to find that rationalities and practices of 'carbon responsibility' pervade some experiments. We find that such forms of responsibility are located in at least two forms of agency: the individual and the community.

In the creation of new forms of individual responsibility for carbon, we find with Paterson and Stripple (2010, p. 347) "the 'conduct of carbon conduct', by which we mean a government of people's carbon dioxide emissions that does not work through the authority of the state or the state system, but through people's governing of their own emissions". We add, however, that critical to these forms of conduct, and to the discourses of carbon responsibility that they give effect to, are intermediary organizations, technologies and daily practice that collectively serve to open and close notions of what it is that 'the self' is required to be responsible for in relation to climate change. Within the T-Zed project, for example, the developers (BCIL) believed that the innovative technical nature of the housing development needed to be accompanied by responsible inhabitants that engage with and enable these technologies to work. As one BCIL worker highlighted: "Making people believe in these technologies is another challenge [for BCIL]" (Developer 9, Interview March 2010). In order to achieve this, BCIL developed a series of dispositions regarding everyday living in the compound that sought to demonstrate the synergies between a 'green' lifestyle and the aspirations of the middle class in a high-tech city like Bangalore. These dispositions included enacting material control over lifestyle choices through innovative fridges and air conditioning systems, supplemented by the installation of automated control devices—which BCIL described as conscience meters—to make residents conscious of both their use of energy and its environmental and economic costs. The central idea was that the design itself enabled a certain politics of life and residence in the compound.

Residents were invited to develop instructions about how to deal with water, waste and energy in their daily lives, and to be self-aware about other aspects of sustainable living. One resident explained "we were supposed to think of guidelines for things like what detergents to use, what cleaning things to use and . . . what you can use in your gardens" (Resident 4, Interview March 2010).

Despite the creation of these dispositions, however, on occasion BCIL felt it necessary to directly regulate life in the compound. For example, they attempted to ban the installation of bathtubs in individual properties, since they reasoned that these create an unsustainable demand of water and disrupt the collective design of T-Zed, and their attempt to mandate the used of organic vegetables was perceived as unrealistic by residents: "a lot of people already have a tendency to look for organic vegetables ... but do you really want to mandate that, knowing you can only have organic vegetables ... I think at one time the idealistic view was that people would be doing that! [Laugh]" (Resident 5, Interview March 2010). The difficult balance between creating dispositions of individual responsibility and achieving meaningful improvements in sustainability was evident in T-Zed, since at the same time as it constrained household practices in the name of environmental sustainability it accepted and even fostered practices which some commentators have highlighted as socially unsustainable, such as the 'maid culture' which it reinforced through provision of an additional room for the maid. At the same time, it is evident that in this case, where a just response to climate change is primarily interpreted in terms of responsibility, issues of distribution are bought to the fore, but questions of procedure—of how the basis for response should be determined and by whom—remain rather hidden from view.

The creation of new articulations of individual responsibility for carbon through experiments such as T-Zed is far from unproblematic and often contested. Nonetheless, such experiments represent political sites within which such notions are being put to the test. This was visible in the Coolest Block Contest in Philadelphia, which promoted the idea of responsibility for climate change adaptation and mitigation at the block-scale in a city characterized by terraced housing. The Coolest Block contest was widely targeted, aiming to promote the self-funded installation of building upgrades which would make homes more comfortable in the context of hotter summers and colder winters, but do so in a way that minimized the carbon intensity of this comfort. However, like the action it hoped to promote, the way the contest was run meant that certain segments of the community fared a much better chance of winning it. As such, the procedural justice aspects of responding to climate change were not explicitly considered. Potential entrants were invited to collect signatures indicating support from residents on their block and to write a short 'essay' explaining why their block should win the upgrades on offer (which included a new cool-roof coating, insulation upgrades, and air-sealing to improve the building envelope). These exercises of civic engagement acted to engender a responsibility for action at the block-scale, led by community champions, who bore the responsibility for enrolling their neighbours into the process. The competition in this way shifted responsibility for governing climate change from the government to the individual, the homeowner, refashioning the municipal government's role as facilitator and supporter of individual action. At the same time, as Section 3.3 will examine in more depth, the contest created the sense that such responsibility bestows rights on the homeowner to benefit from climate change action.

In both Philadelphia and Bangalore, discourses and practices of responsibility shifted between individual homeowners and the community in which they lived. In Philadelphia this was their block; in Bangalore, the T-Zed gated community. But scholars have also pointed to the ways in which 'community' has become a site through which conduct is governed, particularly through encouraging communities to take responsibility for addressing policy issues such as climate change (Summerville et al., 2008). This was particularly noticeable in Hong Kong, where the Climateers project explicitly framed community as an entity that can be mobilized in order to effect behavioural change for energy conservation and to create a constituency for whom acting locally on climate change

mattered and required a political response. The project focused on a group of Climateers Ambassadors, so named because they had signed commitments to reduce their personal carbon footprint through the WWF-Hong Kong Climateers webpage. These Climateers Ambassadors were then provided with training on the impacts and implications of climate change through seminars, interactive learning and visits to wetland and coral reef wildlife reserves, and in return, pledged to sign up 'pen friends' to the scheme in addition to their own personal reductions. The programme was supported by mobile apps, celebrity pledges, information and advice, as well as the training and field trips. Subsequently, with funding support from the Hong Kong Environmental Planning Department, two specific areas of Hong Kong were selected for further support as Climateers, and WWF developed bespoke training programmes and activities with local community groups (particularly youth and women's groups) that focused on providing input for their chosen actions, including in one case the development of 'low carbon cooking' and support for a locally grown food co-operative. Whilst there was certainly plenty of focus on individual responsibility for carbon within the Climateers programme, the 'community' was seen as a vital means through which these responsibilities are both shaped (by place, economy, social norms) and through which they must therefore be realized.

Before concluding our discussion of responsibility, it is important to observe that across these three cases, new forms of responsibility for governing of climate change are emerging in cities, particularly with respect to the role of private sector and civil society actors. In Hong Kong, HSBC emerged as a critical sponsor of a range of behavioural change programmes including Climateers, a range of NGOs (Friends of the Earth, WWF, and GreenSense) are emerging as leaders on climate change action, and certain parts of the business community have been mobilized, particularly in the property and energy sectors. All this activity is actively creating a discourse in which new responsibilities for the governing of climate change are seen to lie outside the state. Likewise in Philadelphia, the lead actors in the Coolest Block Contest were a non-profit organization (the Energy Coordinating Agency) and a private company (Dow Chemical Company), and in Bangalore the low carbon aspiration and delivery of T-Zed was very much driven by the developer. Each of these cases mobilize a discourse of both expertise and ability to act, recognizing that it may be most appropriate for those with resources of various kinds to be the first to respond. This is a different discourse from that which 'puts the last first' in the mould of a Rawlsian notion of social justice. In a way, it puts the 'first first', but when it comes to ensuring that those with responsibility for climate change and/or expertise to address it participate, this may be a necessary part of the response. Clearly, as a range of actors outside government take responsibility for climate change action, their visions of climate justice begin to shape its meaning, and this is likely to have both distributive and procedural consequences. Participation, for instance, will no longer automatically be mediated through democratic channels and bound up with notions of accountability and the public good, highlighting how the notion of responsibility is refracted by distributive and procedural considerations when assessing the outcomes of climate change interventions.

3.3. Making space for climate rights in the city

That responding to climate change may involve not only the attribution of responsibility, but also of rights (to avoid costs, to enjoy benefits) has been increasingly recognized at the international level, particularly as issues of adaptation have come to be considered in justice terms, and in our cases, notions of rights were certainly present, albeit sometimes poorly articulated or ignored amongst other claims. These rights took two primary forms: firstly, rights to benefit from responses to climate change; and secondly, rights to be protected from the impacts of climate change itself and the costs of

climate change action. The intervention in Monterrey provides an example of how what constituted a fair, and indeed progressive, response to climate change was framed in relation to these rights. A low-carbon social housing project, ViDA was originally promoted by the Instituto de la Vivienda de Nuevo León (INFONAVIT—a decentralized service representing CONAVI, the national housing commission) as a low-carbon social housing development which would introduce a series of design principles to conventional social housing that would significantly reduce the energy resources used by the house during its design life and therefore considerably improve the quality of life provided to residents. It focused on building orientation, insulation, ventilation and so on, without modifying the existing patterns and materials of construction of the industry to ensure the housing remained low-cost. In the original design, residents would receive a conventional mortgage from INFONAVIT and the additional costs of the more energy-efficient dwellings were paid by the developers, to whom INFONAVIT provided the land at lower costs. However, when the first mortgages were written INFONAVIT had just launched the 'green mortgage', which provided mortgagees with additional funds to pay for eco-appliances, including low-energy bulbs, a small solar panel for the street lights and water saving fittings for taps and the shower. This green mortgage would subsequently be taken up across Mexico.

The justice discourse of ViDA was clearly one of rights: the project stood as a material reminder that low income people had the same rights to the benefits provided by climate change action as the elites who could afford to upgrade their homes without assistance. ViDA also established a new discourse that being 'green' was entirely compatible with providing access to housing and mortgage finance to the poor. Responding to climate change is in this way reconfigured as a matter of social justice, which provides both long-term savings in household running expenses and, crucially, access to capital in the form of the green mortgage. Further, in bringing the issue of rights to the fore, it is the distribution of benefits that it affords that is bought in to view, while again questions of procedural justice—of the right to participate in determining what would constitute a fair benefit from the response to climate change—remains in the shadows. Moreover, the outcome of the ViDA project points to the difficulties the poor face in claiming these rights, because despite the widespread uptake of the green mortgage across Mexico, residents in the ViDA development have not been able to claim the long-term savings promised by the dwellings. The primary reason for this is that the low-carbon design of the development has proved to be incompatible with the social and economic realities of its inhabitants. In particular, residents have neglected open spaces built into the planning design of the development, have constructed walls to barricade their homes in response to the need for security in response to the 'drug wars' which came into suburban Monterrey, and have constructed additional living and working spaces in response to their dependence on home-based small enterprise for their livelihoods. Together, these interventions have served to reduce the 'passive' benefits of the design in terms of cooling and consequent energy conservation. In the face of these other concerns, the sustainability characteristics of the development and the use of eco-technologies are hardly recognized, and the notion that there might be a right or benefit to be realized in relation to urban responses to climate change seemingly diminishes within the everyday realities of the development (Castán Broto and Bulkeley, 2013b).

The Coolest Block Contest in Philadelphia likewise drew heavily on the notion that residents have rights to benefit from climate change actions in the city, and that they have the right to be protected from adverse weather such as more intense summers and winters as a result of climate change. A representative from the Energy Coordinating Agency explained that "for the city the challenge is really investing significantly in repair and remediation of the existing housing stock to adapt it to climate change and that means a good roof, a roof that will drain and pour all the water off of it and a white roof" (Interview, October 2011). But clearly some residents have a much better chance of being able to lay claim to this right than others. It is telling that on top of the performances of civic engagement discussed in Section 3.2, a crucial judging criterion in the contest was that the roof of the block meets certain standards of structural integrity. The rationale for this was that it was a demonstration project focussed on the cool roof technology, and the organizers were unwilling to undertake significant structural work before installing this roof coating. Yet the message this sends is that residents must be 'worthy' to receive support to make their houses more climate-resilient. Their rights are thus circumscribed and qualified in terms of the distribution of benefit in relation to their perceived responsibility, while other perspectives that might be gained from approaching such an issue through the lens of procedural justice are lost. In the contest, they had to demonstrate that they were responsible homeowners who had kept their houses (particularly the roofs) in a good state of repair; in subsequent programmes such as the *EnergyWorks* programme which provides (nearly) zero-interest loans for energy efficiency upgrades, they have to demonstrate that they are responsible managers of their household finances through having a satisfactory credit score. Those unable to demonstrate their 'worthiness' could seek support of other programmes to assist with maintenance and structural rectifications—including those of the Philadelphia Housing Development Company and NGOs such as Habitat for Humanity—but were unable to meaningfully claim their rights to the enhanced quality of housing that climate change action was providing to others, and neither those deemed responsible nor those deemed outside of this specific programme were empowered to participate in determining climate change responses in the city.

At the same time as residents' rights are qualified, however, the Coolest Block Contest also clearly creates a discourse in which private interests have a valid right to benefit from urban climate change responses, which are seen as an opportunity to profit, not just an opportunity to be good corporate citizens. This right was also being claimed by BCIL in Bangalore, the basic business proposition of which sought to create opportunities for profit from a low-carbon, sustainable housing development. However, in Philadelphia it is more marked, since the Dow Chemical Company's partnership with a non-profit and the city helps legitimize its products and technologies (in this case, the coatings used in the white roofing, the insulation, and the air-sealing products) and promote them as part of the solution to climate change. Yet it is no doubt Dow's hope that as residents benefit from climate change in the form of energy efficiency upgrades leading to reduced expenditure on cooling, more comfortable homes and workplaces, and reductions in heat-related illness an mortality, as well as indirect improvements in air quality due to reduced reliance on fossil fuels, and even a greater sense of community since the contest necessitated engagement with other residents living on one's block, Dow too will benefit from increased sales of its products and technologies. Of course, this is not to pose a simplistic binary between public and private rights, since Dow was clearly a major driver of the contest, but rather to highlight how rights are being articulated in the city.

In exploring the interventions in Monterrey and Philadelphia, a common theme emerges that when climate justice is framed in terms of rights, the discourse focuses much more squarely on distributions than procedures or participation. This distributive understanding of rights is confirmed when we examine the Berlin Solar Atlas, which mapped the potential for solar photovoltaic and solar thermal installations on building rooftops. The Solar Atlas was premised on the notion that building owners and potential investors have the right to benefit from the solar resource available, at the

same time as the city as a whole has a right to shape its energy trajectory. The intention was that individuals would gain an understanding of the potential of their building to harnessing the solar energy available and take action, with the effect that Berlin would reduce its dependence on external energy sources, in particular the coal from Brandenburg which currently underpins Berlin's energy supply. But the initiative has so far failed to stimulate significant activity in the solar sector, and part of the reason for this appears to be the resolutely rights-based notion of justice it has appealed to. Whereas in smaller towns dominated by owner-occupied single-family dwellings the costs of installing solar are straightforwardly offset by benefits in the form of reduced energy bills, in Berlin the prevalence of multi-family residential buildings occupied by renters means that the distribution of costs and benefits, rights and responsibilities is much more complex. The building owners whose rights the Solar Atlas champions have been reluctant to install solar, which precludes potential alternative uses of attic spaces and rooftops while delivering only marginal returns through increased rents. At the same time, residents who are tenants have no rights to demand solar installations, despite the potential benefits to them in the form of reduced energy costs and increased thermal comfort. It seems that discourses of responsibility could prove more amenable to stimulating uptake of solar, particularly in a city characterized by urban poverty. But the Berlin Solar Atlas also points to the critical importance of recognition in achieving climate justice in the city. It is to this facet we now turn.

3.4. Finding recognition in the city?

In each of the cases discussed above, notions of climate justice are intertwined with the nature of interventions taking place and the ways in which the politics of addressing climate change in the city is being enacted. Urban climate change interventions are always engaging with multiple facets of climate justice to varying degrees. Though we have structured our discussion so far around responsibilities and rights, it is clear that these are intrinsically connected to distributional and procedural questions. Furthermore, we have hinted at the insights that the lens of recognition brings. We now turn our focus explicitly to examining how recognition emerges in different forms across the interventions and the ways in which this discourse serves to shape the other dimensions of climate justice.

As discussed above, examining Berlin's Solar Atlas, we find little evidence that notions of recognition were present in the discourse and working of the experiment. The Solar Atlas failed to fully appreciate the structural conditions which underpin life in Berlin, famously described by its former Mayor as "poor but sexy". A conception of justice as recognition would have drawn attention to the fact that Berlin's industrial and segregated past has left a legacy of a city in which most residents rent their homes, which are owned either by private landlords or housing associations. In this context, participatory equality is missing as renters do not have the ability to change their buildings, and the Solar Atlas targeted a disempowered group of people. Despite being an innovative tool with considerable potential for helping address climate change and promote climate justice, the Solar Atlas was therefore the wrong tool to employ to support Berlin's vision of reducing its dependence on fossil fuels and achieve greater renewable generation within its borders. The Solar Atlas would have required significant rectificatory work to address the disempowerment of residents before it could stimulate meaningful change. In fact, it arguably acts only to reinforce the structural inequalities in the city, building more barriers than it removes. Though it shows the potential for solar installations to all, only owners are able to act on this potential, reinforcing existing divisions between renters and homeowners/landlords. Even where landlords do install solar,

questions of distributive justice are raised about who benefits more from the installation—the landlord or tenants—and who should pay for it. And tellingly, it suggests that individual, private initiatives are valued more highly than alternative collective options for energy supply such as recent campaigns for *rekommunalization* of the city's energy infrastructure.

In the other cases, recognition figured to greater or lesser degrees. In Bangalore, the concern of T-Zed with matters of responsibility for emissions reductions did seek to rectify the distributive injustice of unequal footprints across a city in which the middle class is overwhelmingly responsible for increased consumption of energy and water resources. Yet, while T-Zed aims to reduce the resource demands of middle-class housing, the project also enables high-consumption development by providing independent water and energy sources which reduce the reliance of its residents on wider urban socio-ecological and socio-technical networks, thus entrenching the existing structural patterns of disadvantage and doing little to recognize the role of culture and politics in creating these patterns. At the same time, however, in practice the development and the resources it has created have been opened up to different forms of access, with the development ultimately dependent on borehole water that connects it to the wider resource challenges of the city at the same time as its water is also provided to residents of nearby informal settlements (Castán Broto and Bulkeley, 2013b). The case of Climateers in Hong Kong is similarly based on the understanding that the different forms of urban development across the city contribute unevenly to the production of greenhouse gas emissions, yet its focus on making individual residents responsible for minimizing their own carbon footprints simultaneously sustains assumptions that such lifestyles can be continued with relatively minimal adjustment. As the Climateers Ambassadors were put to work in different communities, however, the significant differences in the levels of consumption became more visible, and as participants recognized the differentials of poverty across the city, the programme itself came under question. This led participants to rework the programme to provide a rationale for addressing issues of participation in the community, providing support for a focus on sustainability as the basis for economic activities, and further cementing partnerships between different organizations. In this sense, the programme was iteratively adjusted to address problems of recognition (and indeed carbon inequalities) which had not been visible from the outset, showing how attention to recognition reshapes the understanding of responsibility. However, these more progressive engagements with recognition remained localized, and the programme's key objectives of creating public momentum for urgent action on climate change and a common set of tools and techniques through which to do so has continued largely without reference to the recognition dimension of justice, failing to ask or address questions about how and why contributions to greenhouse gas emissions vary across the city, and whether questions of poverty, exclusion or culture underpin these processes.

In Monterrey, ViDA explicitly attempted to provide for those unable to provide for themselves and promote them on to equal footing with more affluent residents in terms of their rights to benefit from climate change action. But while the rights of the poor to benefit from climate change action were embedded in the rationale for the project, the design of the development and its construction failed to address the fear of violence and limited opportunities for employment and economic development which shape their experience. If their dependence on home-based small enterprise and their need for security in an unstable and frequently unsafe urban environment had been adequately recognized by the developers, the goal of a low carbon, affordable community would undoubtedly have been better served by significantly different

neighbourhood planning and construction decisions. Likewise in Philadelphia, the contest organizers understood that poverty is one of if not the key barrier to climate change adaptation and mitigation in the city. Indeed, the rationale for promoting white roofing according to one of the contest organizers was that it can simultaneously address the poor thermal comfort and high levels of energy use resulting from the inefficient residential buildings *and* the chronic underinvestment in the building fabric which leads to leaking roofs. Yet as discussed in Section 3.3, the design and implementation of the Coolest Block Contest did not attempt to overcome this barrier, nor did it explicitly seek to overcome the underlying problems of racial inequality which underpin structural disadvantage in the city.

Fraser (1997) argues that recognition and distribution must go hand in hand to achieve participatory equality, and procedural considerations are important in providing the opportunity for this to occur. Importantly, however, across the cases we have examined, there is no evidence that active processes of dissent or challenge were encouraged, processes in which we might find the potential for ensuring different segments of the community have a voice or rectifying mis-recognition. Rather, contestation arose in the form of small acts of everyday resistance and a lack of engagement in the upkeep, repair and maintenance required to further the rationalities and ambitions of particular interventions. This suggests that the success of climate change interventions is just as much a matter of their political contestation as their technical achievements, and indeed that the two may be very much intertwined. Making climate justice in the city, then, is not merely a matter of principle, but of the ways in which issues of justice are woven into the continual accomplishment of climate response.

4. Conclusions

This paper has argued that in addition to the conventional international scale, it is productive and indeed necessary to examine how climate justice is being pursued at the urban scale. This is not only because to be adequately resolved, principles of climate justice need to attend to the multiple scales and forms of social organization involved in responding to climate change, but also because urban responses to climate change always and already include an account of what constitutes a 'just response' to climate change. While such notions are more or less explicitly articulated in different contexts, we find notions of climate justice provide a frame through which actions and outcomes are both formulated and evaluated (including, for instance, how to act, who should act, and what constitutes success). As a result, we suggest that the politics and practice of urban climate change responses are shaped by everyday contestations over the meaning of justice.

In seeking to account for the ways in which notions of climate justice have come to matter in the city, we have found it productive to move beyond the planar view of justice as concerned with rights/responsibilities, as is common in much of the (international) literature on climate ethics, and distribution/procedure, as articulated in the debates around environmental justice, and to engage with the emerging work which regards justice as a multivalent concept encompassing notions of recognition. Such as shift is required to adequately account for both the problems of correctly attributing rights and responsibilities below the national scale and, in cities, the complex geographies of inequality which are compounded by the costs and benefits of climate change action. Adding recognition to the existing framings, we suggest, affords the possibility of creating a three-dimensional view of the issue of climate justice, in which different facets are intrinsically interconnected and where any one perspective is inevitably refracted through the prism formed by the interrelation of different elements of justice. For instance, recognition that a city

neighbourhood has been excluded from the benefits of climate change action to improve home energy efficiency has the effect of confirming their rights to benefit from such action, but also creates a responsibility on government to ensure these rights, which must be granted through a combination of distributive and procedural mechanisms. Recognition is conceptualized as the underpinning facet because of its central role in relation to the other facets of justice; without recognition, for instance, true procedural justice is impossible to achieve, and distributions are likely to be affected too, whether they are distributions of rights or responsibilities. Whereas the two dimensional planar view of climate justice (Fig. 1) tends to pose rights and responsibilities, distributions and procedures in opposition to one another, our three dimensional pyramid (Fig. 2b) emphasises the fact that all the facets of justice are interconnected, and that the perspective adopted is important in shaping which facet or facets of justice receives emphasis and which are downplayed or overlooked.

This conceptual framework provided a means through which we could analyze the ways in which notions of justice were being articulated, practiced and contested in the context of five different interventions in Bangalore, Monterrey, Hong Kong, Philadelphia and Berlin. Unlike the environmental justice literature, which tends to frame justice in terms of rights (both to avoid burdens and enjoy benefits), we found that it productive to examine justice in terms of responsibilities to both respond to climate change and to ensure that these responses meet distributive goals. It is clear from our analysis that a variety of actors bear such responsibilities, including individuals, private sector actors, NGOs and governments. In our cases, we observe a trend towards assigning responsibility for reducing emissions to individuals, at the same time as individuals and private companies are both seen as valid beneficiaries of climate change interventions (alternatively put, they have the right to benefit).

Where justice was framed predominantly in terms of responsibilities—notably Bangalore and Hong Kong—recognition of the structural patterns of advantage and disadvantage in the city (and the consequent disparities in greenhouse gas production) tended to be latent rather than patent; a socio-spatial difference that is at once acknowledged in the focus on middle class households but at the same time reproduced through an emphasis on the need to preserve such forms of living. This meant that recognition of the very limited contribution to greenhouse gas emissions from other sections of the urban population was much more partial, neglected in the search for common political and technical projects.

Where justice was framed predominantly in terms of rights—in particular Monterrey and, on balance, Philadelphia (we will come to Berlin shortly)—there was a much clearer recognition of pre-existing patterns of advantage and disadvantage and the ways in which these affect the provision of housing and energy services. Climate change here was invoked as a policy agenda around which new forms of access and resource provision can be mobilized. However, in both Monterrey and Philadelphia this recognition failed to extend to the practical implementation of the initiatives, neither of which—despite some clear successes—ultimately overcame the patterns of disadvantage they had identified as barriers to broad and effective low-carbon living. In Monterrey, this 'partial recognition' resulted in residents modifying the homes in ways which undermined many of their climate-change benefits; in Philadelphia, the aspiration of widespread housing renewal through cool roofing remains just an aspiration, as much of the city is unable to take advantage of the loans being used to finance it. Whereas the responsibility framing of justice discussed in the previous paragraph articulated smoothly with procedural justice, the rights framing tended to focus purely on distributive issues.

Berlin requires special treatment here, because it highlights particularly acutely the problems of unduly focussing on one facet of

climate justice and of mis-recognition. The rights-based framing adopted by the Solar Atlas turned out to be nothing short of counter-productive, since it targeted a constituency who were neither present to enjoy nor inclined to take up their newfound rights to benefit from renewable energy, whilst excluding the majority of Berliners who were denied rights by virtue of being tenants. Lack of attention to recognition thus transformed an innovative tool with considerable potential for helping address climate change and promote climate justice into a visually and technically attractive but largely unused apparatus, the promotion of which potentially hinders rather than helps address Berlin's energy balance.

This analysis suggests that while notions of climate justice have come to be designed into and practiced through urban responses to climate change in a range of urban contexts, the emphasis is on how specific facets of justice—notably rights and responsibilities—relate to questions of distribution. The use of other entry points into questions of justice—from the perspective of procedural justice or the notion of recognition—has been more limited. Our framework suggests, however, that such facets of climate justice cannot be ignored or removed from urban responses to climate change. Rather, they serve to refract and reconfigure the workings of climate change responses in practice, both embedding and unravelling particular projects and creating new sites of contestation and struggle over urban politics. This suggests that there is considerable scope for those involved in the design and implementation of climate change responses in cities to adopt a different starting point when they approach questions such as for whom, how and by what means should cities respond to climate change. The perspective of recognition emerges as a particularly useful entry point through which to explore the types of rights, responsibilities, distributions and procedures required to respond justly to climate change, because it has been neglected in the literature to date despite being in many senses fundamental to just procedures as well as just distributions of rights and responsibilities. To this end, we hope this framework might be used not only as an analytical device as we have used it here, but also a means through which to shape the design of new forms of intervention that take seriously the need to account for issues of justice in the practical urban politics of responding to climate change.

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