Governing Carbon in the Australian City: Local Government Responses

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Abstract: Mitigating and adapting to future changes in climate in the context of urban growth has focused the attention of Australian governments, planners, business and community interests alike. In this landscape we see a proliferation of frameworks and initiatives for governing carbon, from Australian state and local governments as well as a wide array of other actors including the private and not-for-profit sectors. Currently no clear picture of their architecture or workings exists. In this paper we use urban local governments—a central actor in these frameworks—as an entry point. Drawing on recent research aimed to document urban carbon governance across Australia's capital cities—in particular, an audit of carbon reduction initiatives across government, business and community actors at the urban scale—we explore urban local governments as sites of climate change response and experimentation. Our analysis reveals the existence of both conventional and experimental actions—assessment techniques, technologies of governance and forms of social organization—operating at local and extra-local scales. Moreover, the networks assembled to produce this climate governance capacity involve similarly conventional *and* experimental actors, practices and scales. This complex amalgam of conventional and experimental, we suggest, will shape Australian city futures.

1 Introduction

Mitigating changing climate is one of the key challenges of governing city futures and, without doubt, cities are critical sites of carbon governance. But carbon governance research thus far has produced a richer understanding of governance at the scales of the nation-state and international agreements than it has of the dynamics of urban (and inter-urban) governance. Growing evidence suggests that this focus is misplaced insofar as it does not adequately capture the realities of carbon governance in which carbon reduction initiatives emanate from *local* governments and from actors beyond the state—NGOs and private interests— through hybrid partnerships, networks and multilevel governance systems, and with a particular focus on the urban scale (Bulkeley, 2005).

In Australia's case, the inconstancy and uncertainty around national attempts to govern climate and carbon has produced a situation where urban-based local governments have emerged as internationally networked climate activists, involved in innovative and experimental initiatives, often in partnership with other LGAs, community and NGOs and the private sector. Alongside this, there is an uneven landscape of governance initiatives led by businesses and NGOs reflecting their plural and particular interests. This landscape has been the focus of the ARCDP project (DP110100081 Governing carbon: Australia's cities and carbon control) reported on below, which is exploring how carbon is being governed in the Australian city: its institutions, networks, techniques and visions.

In this paper we focus on the actions of urban local governments across Australia in relation to reducing carbon. We have two principal aims. The first is to chart the diverse carbon abatement actions undertaken at the urban scale in Australia and to move beyond descriptive accounts of *what* urban actors in climate governance are doing, to analyze *how* this is taking place. Our second aim is to contest the dominant framing of local governments in carbon governance (and indeed more generally) as unable to effect significant change because of the paralysis produced by limited powers and resources. Central to this framing is the notion that the projects, actions and initiatives local governments undertake are somehow 'outside' the scope of governance, unable to contribute systematically or in more-than-superficial ways to the governance of carbon. In contrast, we are interested in the extent to which local governments are experimenting with carbon governance,

making new rules 'outside well-established channels' and hence governing carbon through a series of innovative responses (see Hoffman 2011).

The paper unfolds in three parts. First, we outline our approach to urban carbon governance and the definition of experimentation we employ. Second, we introduce our national scale study of urban local government activities around carbon, and provide a sketch of the characteristics of these myriad local government interventions. Finally we take a subset of that sample – local government educational initiatives – to explore questions of experimentation.

2 Urban Carbon Governance

Urban responses to climate change, and in particular efforts to govern 'carbon' through mitigation, have increasingly been recognised as a policy challenge and a critical area for research (Bulkeley and Castán Broto, 2012; Anguelovski and Carmin, 2011; Hoffman, 2011). Over the past decade, this research has shown the challenges municipalities face in translating interest into climate change action, but also the depth and scope of activity. For instance Bulkeley and Castán Broto's analysis of 100 global cities produced a database of 627 urban climate change experiments. Our research, similarly, has also shown that a multiplicity of initiatives, both public and private, experimental and more conventional, litter the urban landscape with climate change interventions (McGuirk at al., 2013).

In this project, we interpret these initiatives as critical elements of governing through an analytic of governance situated at the intersection of political economy and governmentality. Here, governing is regarded as a process that takes place through a 'dispersed form of rule' that cuts across conventional public/private spheres, and is structured by particular hegemonies or rationalities. Governing is orchestrated by the relation between particular interests and distinct problematics and it addresses these problematics with a 'will to improve' (Murray Li 2007). In this case the interests are urban-based and the problematics are climate change and carbon reduction in the city. Governing is a process not confined to the public sphere nor to formalised politics. It requires the assemblage or alignment of diverse actors and interests as well as materials, artefacts, infrastructures and so on to achieve the 'right disposition of things' (Paterson and Stripple, 2010) within which conduct can be governed in line with programmatic aims.

Such an approach suggests that governing is not confined to formal institutions, or institutionalized policies and programs, but is rather a process that exceeds and transcends such boundaries. As such, initiatives (such as climate change initiatives run through local governments), rather than being isolated or 'stand-alone' projects, in this view are *already part* of the way in which governing is conducted. And, as we discuss later, these projects often involve experimentation around the institutions and practices through which carbon governance might be unfolded.

3 Urban Carbon Governance in Australia

We begin with a brief overview of the Australian policy context. Australia's constitutional arrangements require multilevel cooperation to induce significant change in governing carbon reduction (eg energy policy, land-use and transport planning and buildings). So Australia's climate governance regime is characteristically multilevel and overlapping. Until relatively recently, there has been a policy vacuum at the Federal level that has been filled by a profusion of state and local government policy responses and climate initiatives. For example, in 2011 the Productivity Commission found 230 emissions reductions policies operating in Australia, covering a gamut of governing mechanisms: explicit carbon prices; grants, subsidies and rebates; regulatory instruments; direct government expenditure; information provision, benchmarking, voluntary agreements. The list goes on. The introduction of a carbon tax prompted some streamlining, but also coincided with a series of emergent initiatives around energy efficiency measures.

Yet whilst some are critical of this profusion (Daley et al., 2011), there are two elements of this regime that are important for our analysis. The first is that, through this vacuum, local governments have emerged as internationally-networked climate activists despite their limited powers and weak constitutional position (Bulkeley and Schroeder, 2009; Jones, 2012). Federal and state political authorities have historically granted local governments limited institutional recognition and have been

reluctant to recognise them as legitimate partners in climate governance (Storey *et al.*, 2012; Urbis, 2010). Thus their capacity has been limited by inadequate inter-government cooperation and coordination and by both federal and state reluctance, to date, to align climate policy with city development issues (Jones, 2012). Nonetheless, their active role in an unsettled landscape of multilevel, overlapping and often short-lived governance efforts has seen them undertake innovative and experimental initiatives and projects, often in partnership with other local governments or with community and non-government organisations (for a recent review see Storey *et al.*, 2012; Hoff, 2010; Urbis, 2010; Zeppel, 2012). Despite lacking control over key relevant policy areas, they have initiated some of the most advanced carbon management strategies in place at the moment, including participation in the Cities for Climate Protection Network, Melbourne's Net Zero Emissions by 2020 policy, and the City of Sydney's as Australia's first recognised first carbon neutral government. They have contributed to reducing emissions through 'self-governing' measures targeting the emissions of the local government authority and its operations, and promoting broader community emissions-reduction through a range of 'enabling' activities (e.g. education, information provision and local service provision) (see Bulkeley and Kern, 2006; Jones, 2012). This widening role of urban local governments emphasises the need for multi-level understandings of climate governance on the one hand (Leck and Simon, 2013) and, on the other, for deeper understandings of the various ways local governments are being drawn into climate governance (Anguelovski & Carmin, 2011; Bulkeley and Schroeder, 2009; Pillora, 2010; While et al, 2010; Granberg and Elander, 2007). As urban local governments have emerged as important players, they have extended traditional powers and roles to climate governance and developed new roles that leverage their capacities to drive behaviour change, materialise low carbon built environments and economies, and enable transitions to low-carbon energy systems and practices.

Our second point about the profuse nature of Australia's carbon governance regime is that analysis requires a focus on both the conventional tools of governments – regulations, plans, policies, blueprints – *and* of innovative and experimental project-based initiatives. While this recognition might render the field of governance somewhat chaotic, these projects need to be recognised as mechanisms through which carbon *is being* governed. So in what follows we are explicitly not interested in plans, policies and blueprints on their own, but we focus on concrete projects and initiatives that intervene in a purposive, often material and frequently experimental way.

3.1 Project Audit

Because of these complex but potentially significant roles of local government, our research project began with a survey of carbon abatement initiatives being undertaken by local government areas across all eight of Australia's state and territory capital cities (Sydney, Brisbane, Canberra, Darwin, Adelaide, Melbourne, Hobart and Perth). Given our resources, it was not possible to survey all local governments in these cities but about one third of them. Thus, the audit encompassed a sample of small and large, CBD, inner and mid city, and outer suburban LGAs. Using local government websites and related material, we identified and documented governing initiatives related to buildings, transport and energy infrastructure. Then, using a framework developed by Bulkeley and Castán Broto (2012), we classified these according to who initiated/participated, the focus of the initiative, the mechanisms through which it was undertaken, its target audiences and its funding. We identified over 600 local government carbon reduction initiatives across the capital cities. In what follows we outline the broad patterns in what was being governed, by which kinds of mechanisms or techniques, and who was involved in governing.

As Table 1 illustrates, about 40 per cent of these local government initiatives were focused on energy infrastructure; for instance on solar installations, the installation of energy efficiency appliances or LED street lighting. Approximately a third were focused on buildings – residential dwellings, commercial buildings, and council buildings like libraries and community centres. Roughly a quarter focussed on transport.

Transport initiatives are the least frequently undertaken by urban local governments across Australian capital cities—we identified 146 initiatives. This is not entirely surprising given local governments limited legislative and regulatory purview in the transport domain. In this domain, the transition to low carbon fleet vehicles is a common theme. For individuals, councils are also attempting to address motorised individual travel behaviour through demand management.

The audit revealed 214 initiatives focused on carbon abatement by acting on buildings (residential and non-residential), using technological, regulatory and behavioural means to reduce buildings' energy

demands by increasing energy efficiency or promoting installation of renewable energy technologies. Commonly this involves a focus on retrofitting council's own built assets (libraries, community centres, offices, childcare centres) or establishing energy efficiency requirements for any new local government buildings. And the bulk of these initiatives governed carbon through technology, for instance employing direct techniques to encourage householders and businesses to make their residential or commercial buildings technically more energy efficient and/or making available subsidies for installation of PVs.

Initiatives related to energy infrastructure [the provision of renewable and/or low carbon energy supply, encouraging reduced use of carbon-intensive energy sources or reduced energy consumption in general] are the most prevalent in our audit. We identified 277 initiatives. Half of these focus on local governments' own processes or assets, with commitments to purchase green power at the forefront here. Though the focus on households here is also pronounced. A little less than half these initiatives use behavioural mechanisms to reduce energy demand. Such initiatives frequently target the household. Relatedly, an equal number focus on efficiency with existing technology rather than via the introduction or promotion of newer technologies.

When it comes to how these initiatives attempted to govern carbon, as Table 2 illustrates, both what we refer to as technical and social measures were used, often in concert with each other. A common technical measure was changing to more efficient forms of lighting – both street and household. Also common were actions directed at residents and businesses within the LGA using enabling or 'soft' regulatory measures (such as targets). We think of these as social measures. These acted in concert with an array of behavioural mechanisms to encourage more efficient use of energy through actions across a wider audience, like providing free assessments of energy use in homes and businesses, providing lay energy-auditing toolkits, educational workshops on where and how energy is used in the home, and wider public accountability strategies, such as Newcastle's 'ClimateCam' that publicly displays carbon use for specified zones across the city.

Much less common was the provision of new infrastructure. In infrastructure there were instances of councils bulk-buying solar panels to then sell to households at a reduced rate. In transport, Councils are encouraging alternative transport through provision and maintenance of infrastructure (generally walking and cycling infrastructure including end of trip facilities and bike hire schemes). Regulatory or market mechanisms were less likely again to be deployed.

Finally, we turn the question of with whom (if anyone) do local governments undertake carbon governance? As Table 3 suggests, most of the initiatives were undertaken by local governments operating on their own, using their own funding. When they did partner with other institutions, it was most likely to be with other local governments, or with their state governments, or corporations in, broadly, equal measure. What we have subsequently found, however, that these partnerships and networks can be very loosely partnered. They can, for instance, consist of each council independently implementing a broad umbrella strategy—like Cities for Climate Protection or Sustainability Street—without direct collaboration with each other. Further work into the nature of these partnerships, what and how they seek to govern is warranted.

4 Urban local government and experimental carbon governance

The notion of experimentation has recently taken hold as a way of understanding these carbon governance initiatives (Hammer et al., 2010; Anguelovski and Carmin, 2011; Hoffman, 2011; Bulkeley and Castán Broto, 2012). Conceptualizations of experimentation cohere around two distinct issues. The first is the extent to which a carbon governance initiative may involve an uncharacteristic set of institutions, actors or funding arrangements. This might be termed institutional experimentation. The second is the extent to which an initiative attempts to re-assemble the socio-technical relations that shape carbon consumption practices. This might be termed socio-technical experimentation. We draw on both definitions below, defining urban climate change experiments as involving either/both: (a) establishing new institutional relationships between actors that create 'new political spaces' for governing carbon; and/or (b) the re-assembling of socio-technical relations, or reworking how technologies/infrastructures that shape carbon consumption are embedded in everyday life. Each of these create 'new dispositions' for governing carbon. So we use the concept of experimentation to highlight the kinds of innovative roles that local governments in Australian cities are taking in terms of carbon governance, while recognizing that they contribute to carbon governance also through more established roles and mechanisms.

In this last section of the paper we interrogate these experimental modes by focusing on just one type of initiative – those that had an education component. We chose education because of its potential to highlight both experimentation and non-experimentation. Environmental education – for example around recycling – has long been the purview of Australian local governments (Cuthill, 2002), and it would seem likely that this activity might extend to carbon reduction in quite conventional ways. At the same time, we know from historical contexts that education can be an arena for experimentation, especially in attempts to re-arrange socio-technical relations (Whitehead, 2009). Moreover, education is central to the discussion of governing behaviour change that dominates many understandings of carbon governance (Moloney et al., 2010).

So, to tease out the varied dynamics of local government experimentation, we isolated initiatives concerned with education for carbon reduction and analysed and classified them further according to their experimental dimensions. We found that there was a relatively high level of experimentation occurring and that our two different 'modes' of experimentation—institutional and socio-technical—often occurred together. In other words, local governments were involved in educational initiatives that were working through new institutional relationships and that were attempting to re-assemble the socio-technical relations that shape carbon consumption. There were, nonetheless, 'non experiments' – local governments acting alone and in well-established veins. These non-experiments, in the main one-off workshops, albeit focused on carbon reduction, focused on information provision rather than reworking socio-technical relations *per se*.

We turn now to explore, briefly, three examples of initiatives involving local governments in varied kinds of education-oriented projects that illustrate these two modes of experimentation in operation.

4.1 Treading Lightly: Eco-Living in the inner west

Our first example tackles head on the *realpolitik* of local government in Australia and the problem of local government fragmentation that leaves collaboration and joint service provision poorly developed (Jones 2012). In this initiative—*Treading Lightly: Eco-Living in the inner west*—four adjoining local governments in Sydney's inner west (Ashfield, Burwood, Canada Bay and Leichhardt) have collaborated expressly to pool resources so as to expand their capacity to provide education programs through leveraging off new institutional relations.

Treading Lightly consists of 6-monthly blocks of weekly workshops that target local householders and focus on domestic and household practices: domestic energy and waste reduction, green renovation, green gardening, domestic food production and local food sourcing. Notably, the LGAs involved have used the pooled resources to extend beyond the conventional information-provision mode of local government education programs to focus especially on interactive workshops that coach participants in the practical skills to enable households to live more sustainably and, recognising the inner suburban context, the skills to live sustainably in smaller-scaled, often rental living spaces. So there is a customised capacity-building dynamic. It is a specialisation arguably made possible by the cross-LGA partnership.

The partnership also has the capacity to build beyond more conventional styles of local government education by leveraging wider network formation through which new knowledge and practices around carbon reduction might be nurtured. For instance, the launch of the 2012 workshop program involved a screening of the climate change film *The Hungry Tide*, to bring community members together and connect them to climate action groups operating in the locality. As the initiative's website stated, the councils were "keen to introduce members of local environmental organisations at this 'mixer'. The joint Councils … cordially invite members of Climate Action Newtown to attend the screening and represent your group at this networking event "www.facebook.com/events/315827425120938/). The joint local governments mobilised the launch, then, as an opportunity to encourage new network formation and climate action activists from a neighbouring councils so as to nurture further cross-jurisdictional connections. We understand *Treading Lightly*, then as experimental in the sense of establishing a new institutional partnership across several LGAs – a modest 'new political space' enabling new modes of local government education provision.

4.2 The Sustainability Hub, Randwick LGA

We class our second example as experimental in term of its interventions aimed at reinscribing socio-technical relations. The Sustainability Hub at Randwick (again in inner Sydney) is the initiative of a single local government that drew on NSW state government funding to retrofit and repurpose a community centre as a Sustainability Hub. The Hub's mode of operation was derived from a

participatory process that identified a dual role for the Hub in building community capacity to engage with water and energy saving technologies and practices. The first role is as a demonstration centre to exhibit simple technologies *in situ*, that are generally commercially available and that householders could straightforwardly employ. This demonstration works through a Permaculture Interpretive Garden (PIG) that surrounds the Hub building, through the retrofit of the building itself (wind turbine, solar, water system) and through water-wise and energy-wise trails that lead visitors through these elements, including through a demonstration home set up in the Hub.

Its second role is as a skills training site in which the garden and the retrofit features are used for community and school education about—amongst other things—carbon reduction technologies and their integration into everyday life. Interestingly, its school excursion program is developed to fit with the primary school science curriculum. In this example then, the local government education role is worked specifically via the demonstration effect of the site itself, enrolled to work on reconfiguring householder's socio-technical relations.

Demonstration as utilised at the Sustainability Hub is pedagogical in that it aims, through experiential and material learning, to transform householders' and school-children's engagements with energy-consuming technologies in their homes, gardens and beyond. It operates here on reworking these socio-technical relations through techniques of exhibition which represent, in a holistic and material way, how things could and should work (Whitehead, 2009). We understand the Sustainability Hub, then, as experimental in the sense of involving local government in education that facilitates experience of and learning about transformed modes of socio-technical relationships that might shape a different carbon future.

4.3 Adelaide Solar City

Adelaide Solar City—which we understand as experimental in both modes (ie in terms of institutional and socio-technical relations) is one of 7 projects funded by the Federal Government's Solar Cities Programme which was launched in 2004 and ran until 2012 to showcase sustainable energy models that help consumers and retailers to monitor their energy use and use energy more wisely. It subsidised consortia of local government with energy, finance and land corporations to trial a complex array of new solar and energy efficient technologies, new grid-based technologies, alternative technologies for electricity storage and consumption, as well as energy efficiency measures across urban locales to showcase market viability and energy efficiency gains.

Adelaide Solar City is a partnership between 3 municipalities and a consortium of energy, finance and land corporations with a stake in the urban and energy development of the city. The project is a multifaceted experiment, which establishes a new political space within which municipalities – who have very little sway over energy provision or consumption at the urban level – have taken on new responsibilities in order to realise urban 'improvement'. The project also creates a space in which energy/other corporates can seek to work with a scale that is not familiar to them – the 'community'. It involves multiple forms of intervention, but in its educative guise seeks to provide individual householders with information about both how to use energy more efficiently but also about how to become a new form of energy citizen/consumer, using new products, forms of information, tariffs and so on, so as to 'responsibly' consume energy while also addressing the issue of climate change. This is experimentation in its 'liberal environmental' mode, where existing forms of liberal beliefs about the economy and the individual are pulled into the service of the solar city. Our point here is to highlight that experimentation does not necessarily involve challenging orthodoxies (of liberal environmentalism or ecological modernism). Rather it can be connected to enacting ecological modernisation and a form of urban environmental entrepreneurialism (see Whitehead, 2013).

5 Conclusion

Our key point in this paper is to highlight the critical and still emergent role local governments play in governing carbon. Through a myriad of initiatives, in partnership with others and acting alone, and through a predominant focus on energy efficiency, local governments are addressing climate issues, drawing on conventional but also on experimental modes. Indeed, it is through these initiatives that local governments are enacting authority in carbon governance. In using demonstration as a key mechanism for instigating change, especially in our Solar City and Sustainability Hub examples, these local governments are announcing their capacity for, and claiming a role in, carbon governance. Similarly, we might interpret the focus of the experimental education initiatives treated here as seeking to reach into household and domestic spaces and, through educative means, to shape the authority to govern through these educative interventions. Whilst not abandoning more conventional modes and

means of government, these initiatives are one way in which, in responding to climate change, local governments are reaching beyond their formal parameters of their authority, experimenting with novel partnership configurations or governance programs (Bulkeley *et al.,* 2011).

Crucially though, urban local governments and the diverse initiatives and experiments they are engaged in are a vital element in the deeply political questions of how carbon is being problematized and acted upon. Carbon governance through experimentation in cities is therefore a political site, and, as such, the conditions under which these initiatives are formed and the political legitimacy they claim should be central to our ongoing investigations of the politics of the urban governance of carbon.

TABLE 1	Transport			Energy Infrastructure			Buildings			
	#	% of LG transport initiatives (146)	% of all LG initiatives (637)	#	% of energy initiatives (277)	% of all LG initiatives (637)	#	% of buildings initiatives (214)	% of all LG initiatives (637)	Total %
Total LG initiatives (637)	**146**	**100.00**	**23**	**277**	**100**	**43**	**214**	**100**	**33.59**	**100.00**
Target audience										
Own organization	71	49%	11%	151	55%	24%	54	25%	8%	**43**
Household/travellers	92	63%	14%	115	42%	18%	110	51%	17%	**50**
Builder/developer manufacturers	1	0.6%	0.2%	6	2%	3%	29	14%	5%	**6**
Business	12	8%	2%	28	10%	4%	55	26%	9%	**15**

Table 1: Local government carbon reduction initiatives: target audien

TABLE 2	Transport			Energy Infrastructure			Buildings			
	#	% of LG transport initiatives (146)	% of all LG initiatives (637)	#	% of energy initiatives (277)	% of all LG initiatives (637)	#	% of buildings initiatives (214)	% of all LG initiatives (637)	Total %
Total LG initiatives (637)	**146**	**100.00**	**22.92**	**277**	**100**	**43.49**	**214**	**100**	**33.59**	**100.00**
Governance Mechanism										
Technical Innovation	50	34%	8%	172	62%	27%	183	86%	29%	**64%**
Social Innovation	112	77%	18%	199	72%	31%	146	68%	23%	**72%**
Mechanism - Regulation	17	12%	3%	58	21%	9%	61	29%	10%	**21%**
Mechanism - Market	23	16%	4%	82	30$	13%	54	25%	8%	**25%**
Mechanism - Enabling	96	66%	15%	234	84%	37%	188	88%	29%	**81%**
Mechanism - Provision	52	36%	8%	109	39%	17%	81	38%	15%	**34%**

Table 2: Local government carbon reduction initiatives: governance mechanisms

TABLE 3	Transport			Energy Infrastructure			Buildings			
	#	% of LG transport initiatives (146)	% of all LG initiatives (637)	#	% of energy initiatives (277)	% of all LG initiatives (637)	#	% of buildings initiatives (214)	% of all LG initiatives (637)	Total %
Total LG initiatives (637)	**146**	**100.00**	**22.92**	**277**	**100**	**43.49**	**214**	**100**	**33.59**	**100.00**
Institutional Form										
No partners	80	55%	13%	141	51%	22%	103	48%	16%	**51%**
Partners – Federal govt	5	3%	0.7	14	5%	2%	14	7%	2%	**5%**
Partners – State govt	30	21%	5%	49	18%	8%	42	20%	7%	**19%**
Partners – Local govt	15	10%	2%	92	33%	14%	68	32%	11%	**27%**
Partners – NGO	8	5%	1%	8	3%	1%	14	7%	2%	**5%**
Partners – Corporation	29	20%	5%	68	25%	11%	55	26%	9%	**24%**
Federal govt funding	7	5%	1%	13	5%	2%	15	7%	2%	**5%**
State govt funding	34	23%	5%	63	23%	10%	42	20%	7%	**22%**
Local govt funding	136	93%	21%	235	85%	37%	191	89%	30%	**88%**

Table 3: Local government carbon reduction initiatives: institutional form

References

Anguelovski, I. & Carmin, J., (2011) Something borrowed, everything new: innovation and institutionalisation in urban climate governance, *Environmental Sustainability, 3,* pp.169-175

Bulkeley, H. (2005) Reconfiguring environmental governance: Towards a politics of scales and networks, *Political Geography*, 24, pp.875-902.

Bulkeley, H. & Kern, K., (2006) Local government and the governing of climate change in Germany and the UK, *Urban Studies,* 43, pp.2237-2259.

Bulkeley, H. & Schroeder, H., 2009, 'Governing Climate change Post-2012: The Role of Global Cities - Melbourne', *Tyndall Centre for Climate Change Research,* Working Paper 138, available http://www.tyndall.ac.uk/tyndall-publications/working-paper/2009/climate-change-post-2012-role-global-cities-melbourne accessed 24/06/12.

Bulkeley, H. and Castán Broto, V. (2012) Government by experiment? Global cities and the governing of climate change 38, pp.361-75.

Bulkeley, H., Castán Broto, V., Hodson, M. & Marvin, S. (2011) *Cities and Low Carbon Transitions*, (New York, Routledge).

Cuthill, M. (2002) Exploratory research: citizen participation, local government and sustainable development in Australia, *Sustainable Development*, 10, pp.79-89.

Daley, J., Edis, T., and Reichl, J. (2011) *Learning the Hard Way: Australia's Policies to Reduce Emissions* (Melbourne, Grattan Institute).

Granberg, M. and Elander, I. (2007) Local governance and climate change: Reflections on the Swedish Experience, Local Environment, 12, pp.537-548.

Hammer, S., Keirstead, J., Dhakal, S., Mitchell, J., Colley, M., Connell, R., Gonzalez, R., Herve-Mignucci, M., Parshall, L., Schulz, N. & Hyamns, M. (2011) Climate change and urban energy systems', in *C.* Rozenweig, W., Solecki, S. Hammer. and S. & Mehrotra, S. *(*eds*)*,*Climate Change and Cities: First Assessment Report of the Urban Climate Change Network* Cambridge, Cambridge University Press), pp.85-111.

Hoff, J. (2010) *Local Climate Protection Programs in Australia and New Zealand: results, dilemmas and relevance for future action*, Department Political Science, University of Copenhagen, available http://e-government.vuw.ac.nz/visiting%20staff/Jens%20Hoff%20-%20Local%20Climate%20Jens_Hoff_Protection_Programmes_in_Australia_and_New_Zealand_final.pdf accessed 12/10/12. 104.

Hoffman, M. (2011) *Climate Governance at the Crossroads – Experimenting with a Global Response After Kyoto* (New York, *O*xford University Press).

Jones, S. (2012) A tale of two cities: climate change policies in Vancouver and Melbourne: barometres of cooperative federalism, *International Journal of Urban and Regional Research*, 36, 1242-1267

Leck, H. and Simon, D. (2013) Fostering multi-scalar collaboration and cooperation for effective climate change adaptation, *Urban Studies*, 50, pp.2130-38

M^{c}Guirk, P.M., Bulkeley, H. and Dowling, R. (2013) Governing carbon in the Australian city: hegemonic projects in-the-making? Paper presented to the Institute of Australian Geographers Conferene, University of Western Australia, Perth

Moloney, S. Horne, R. E. and Fien J. (2010) Transitioning to low carbon communities – From behaviour change to systemic change: Lessons from Australia, *Energy Policy*,38,7614-7623

Murray Li, T. (2007) *The Will to Improve: Governmentality, Development, and the Practice of Politics*, (London, Duke University Press).

Paterson, M. and Stripple, J. (2010) My Space: governing individual's carbon emissions, *Environment and Planning D*, 28, pp.342-362.

Pillora, S. (2010) *Australian Local Government and Climate Change* http://www.acelg.org.au/upload/program1/1296541034_Climate_Change_Paper_WEB1.pdf, accessed 6/8/12 .

Productivity Commission, 2011, *Carbon Emission Policies in Key Economies*. (Canberra, Commonwealth of Australia)..

Storey, H., Brennan, M., Pillora, S. & Thomas, C., 2012, '*Local Action for a Low Carbon Future, Australian Centre of Excellence for Local Government*', University of Technology, Sydney, available http://www.acelg.org.au/upload/program1/1340074932_Final_Local_Action_for_a_Low_Carbon_Future_13jun2012_lowres.pdf accessed 23/10/12.

Urbis, 2010, *Preparing for Climate Change in NSW: Local Government Responses to a Global Problem*, Urbis Pty Ltd. Available at www.gcc.nsw.gov.au/.../450/BP-OM-230610-I10.pdf.aspx, accessed 16/9/12.

While, A., Jonas, A., and Gibbs, D. (2010) From sustainable development to carbon control: eco-state restructuring and the politics of urban and regional development. *Transactions of the Institute of British Geographers, 35*, 76-93.
Whitehead, M. (2009). *State, science and the skies: Governmentalities of the British atmosphere*. (Blackwell, ChichesterWiley).
Whitehead, M., (2013) Neoliberal urban environmentalism and the adaptive city: towards a critical urban theory and climate change, *Urban Studies*, 50, 1348-67
Zepple, H., (2012) Governing carbon mitigation and climate change within local councils: A case study of Adelaide, South Australia', *Commonwealth Journal of Local Governance,* 10, 70-85.