Tyndall°Centre
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Transition to sustainable development in the UK housing sector: from case study to model implementation

Noam Bergman, Lorraine Whitmarsh and Jonathan Köhler

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Governing Climate Change Post-2012: The Role of Global Cities - London

Harriet Bulkeley and Heike Schroeder

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Abstract

While international negotiations for a climate change policy framework post-2012 continue, there is increasing recognition that a range of activities to reduce greenhouse gas emissions are taking place 'beyond' this formal arena. This working paper contributes to the research of the Tyndall Centre programme 1 by focusing on a group of non nation-state actors - global cities – and their role in climate governance. Cities are a critical source of man-made carbon dioxide emissions – accounting for as much as 78% by some accounts (Stern 2006) – and places where vulnerability to climate change may be acute. The project includes four case-studies: London, Los Angeles, Mexico City and Melbourne. This working paper documents the experience of London. It charts the emergence and evolution of London's climate change policy in the period 2000 – 2008. It argues that this has been marked the development of initiatives for addressing climate change which fall into three core categories: leadership; infrastructural change; and changing practice.

Leadership has been an important means through which officials and politicians in London have been able to justify and extend their actions. Addressing issues of infrastructure provision, and in particular energy supply, has been critical in setting out the ambitious targets in both climate change policy and wider frameworks of land-use planning. Seeking to address the practices of energy use amongst domestic and commercial actors in London has been a significant means through which authorities have sought to extend their reach beyond their nominal jurisdictions for reducing emissions of greenhouse gases. These three approaches have depended on a mixture of governing modes, or approaches, including traditional government functions of control and compliance (e.g. planning), providing new forms of service (e.g. energy) and enabling (e.g. partnerships). This is creating innovative responses to climate change in the city, but considerable challenges have also been encountered. First, in terms of leadership, whether the momentum created by a particular cohort of individuals can be maintained over time, particularly in a context of party political change, is moot. Second, in terms of achieving infrastructural change, while there have been challenges in relation to the business response to this issue, this has been less confrontational than might have been expected. Instead, the major challenges have come from national level energy policy and regulation, a lack of technical expertise in planning authorities, and the novelty of the technologies themselves. Third, in seeking to change practices at the household and commercial level barriers remain in relation to the take-up and follow through of advice in individual households and companies, the skills available to embed energy efficiency technologies in the built environment, and in terms of the finances available to sustain partnership working in general and certain schemes in particular.

As regards the impacts of, and influence upon, the post-2012 international climate policy framework, three conclusions from this report are particularly salient. First, the specific details of any international agreement are of less importance than its general features. In short, for London, any agreement will be better than none. Second, any such agreement is likely to have an *indirect* but still significant impact on London's climate policy, in particular because of its importance of shaping the climate policy positions of the EU and UK government, and the nature of business engagement on the issue. Third, London's influence on the international policy framework is also indirect. Through the establishment of the C40 network, London, together with other global cities, may be affecting the tenor of domestic climate politics in several countries which will be critical to the make-up of the post-2012 policy framework. In this manner, a non (nation) state actor such as London may be significant beyond its jurisdictional realm.

1. Introduction

While negotiations towards an international framework for climate change action continue, there is increasing recognition that a range of activities to reduce greenhouse gas emissions are taking place 'beyond' the formal arena of international negotiations. The purpose of Tyndall Programme 1 is to examine the significance of the activities of 'non (nation) state' actors in addressing climate change, and to assess how they are affecting and will be affected by the post-2012 international policy framework.

International climate change policy has developed significantly over the past twenty years. In 1992, the United Nations Framework Convention on Climate Change was agreed at Rio with countries pledging to prevent 'dangerous interference with the climate system'. In 1997, the Kyoto Protocol gave countries in the OECD and former Eastern Europe and Soviet Union mandatory targets to reduce emissions of greenhouse gases by 2008-2012, together with a range of economic instruments designed to assist with this goal. Over the past decade, negotiations have continued as the finer details of the Kyoto Protocol, the economic instruments – the Clean Development Mechanism, Emissions Trading and Joint Implementation – and issues of enforcement are hammered out. Although few countries have met their targets under the Kyoto Protocol, and the USA remains outside it, negotiations are now under way to develop a 'post-2012' agreement. To date, most analysis has focused on the role of nation-states in the design, promotion and implementation of various 'post-2012' policy architectures and instruments. This Tyndall Centre Programme suggests that there are other, non (nation) state actors who may be critical in both shaping the post-2012 climate agreement and in its implementation.

This research project focuses on one such group of actors: global cities. Cities across the world have been responding to the challenge of climate change for over a decade (Betsill and Bulkeley 2007). Recent years have witnessed an increasing importance of urban responses to climate change, with the gradual involvement of urban political leaders (e.g. the US Mayors Climate Change Agreement and the Bali World Mayors and Local Governments Climate Protection Agreement) and major, global and mega-cities in climate change policy (e.g. through the networks Metropolis and C40). This shift has been accompanied by the growing recognition of cities as the predominant source of anthropogenic carbon dioxide emissions – perhaps as much as 78% by some accounts (Stern 2006) – and as places where vulnerability to climate change may be acute. For the world's major cities, climate change is therefore becoming an issue of increasing political and environmental significance. Critical questions remain, however, about how far such concerns are being translated into action and how the international policy framework facilitates or impedes action at this level of governance. As the international negotiations unfold, we have identified four areas which may be significant for urban level climate policy, and where global cities may have an impact on the implementation of future climate policy:

- Targets and timetables: the inclusion, level and nature of targets for reducing emissions of greenhouse gases
- Membership: which nation-states do or do not sign up to a new international agreement
- Carbon finance and markets: access to the CDM and/or emissions trading schemes for municipalities and/or carbon financing for urban projects
- Adaptation: access to finance for adaptation for cities in the Global South

In this context, the research project seeks to address three central questions:

1. What action is taking place in global cities on climate change and why?
2. What barriers and opportunities have been encountered?

3. How relevant is post-2012 climate policy for global cities, and how in turn might developments at the urban level affect international climate policy?

In order to address these questions, the project focuses on four case-studies: London, Los Angeles, Mexico City and Melbourne. This report documents the experience of London. It is based on the analysis of policy documents and interviews with representatives of the public and private sector in London conducted between December 2007 and April 2008.[1] The next section outlines the research context for London, including the national policy context and the history of climate policy in the city. It provides an overview of the action taking place and the drivers behind policy development. Section 3 provides detail on some specific initiatives and of the opportunities and challenges which they have encountered. Section 4 considers the opportunities and challenges arising from working with other public and private sector actors. Section 5 focuses on the question of the role and importance of the relation between post-2012 international climate policy and London. Section 6 provides a short conclusion.

2. Research Context

2.1 Climate change policy in the UK[2]

The UK has been a key actor in supporting the development of international climate change policy since the late 1980s. It is one of only a handful of countries due to meet its target under the Kyoto Protocol - which, under the EU bubble, is a reduction of 12.5% of 1990 levels by 2008-12 - due to the "dash for gas" under Prime Minister Thatcher in the energy generation sector. During the early 1990s, little further domestic action was taken to address greenhouse gas emissions, but the end of the decade saw some policy innovation in several fields including the introduction of a Climate Change Levy on larger energy users and the 'fuel-duty' escalator on petrol, which was later abandoned in the face of protest. By 2000, disquiet began to be voiced about the lack of action being undertaken domestically by the UK, particularly given its strong international stance (Grubb 2002; Ott 2001). In response, the government published a revised Climate Change Programme in 2000. Shortly afterwards, an influential report by the UK Royal Commission on Environmental Pollution proposed that the UK adopt an ambitious, long-term target of a 60 per cent reduction in greenhouse gas emissions from 1990 levels by 2050, a target which has since been received favourably by the UK and other national, regional and local governments.

Despite the level of ambition, by 2004 it was clear that the 2000 Climate Change Programme would not deliver its target reductions in greenhouse gas emissions. Although emissions fell overall by 14.6% between 1990 and 2004, carbon dioxide emissions were increasing by approximately 2% per annum from 2002. The government admitted that it was unlikely to meet its goal of a 20% reduction by 2010, initially estimating a 10MtC shortfall, but subsequently revising this upwards to 15 MtC.[3] In 2006, a revised Climate Change Programme was published, emphasising in particular the international role of the UK in tackling climate change and signing up to the long term target of a reduction of emissions of 60% by 2050. Also important at this time was the Treasury-commissioned Stern Review, focusing on the detrimental economic impacts of failing to mitigate

[1] We are grateful to all those who gave their valuable time and insights to the study. We thank the rest of the Tyndall Programme 1 team – Chuks Okereke, Alex Haxeltine, Duncan Russell, Diana Liverman and Heather Lovell – as well as Jonathan Gaventa, Max Boykoff, Jimin Zhao and Juan Arredondo for their comments on a draft of the report. The views expressed in this report are those of the authors alone.

[2] This section is based on Lovell.et al. (2008).

[3] Several explanations have been proposed for the UK's rise in emissions, including: a greater proportion of electricity generated by coal because of a significant increase in gas prices since 2004; the energy efficiency 'rebound effect'; significant increases in emissions from the transport sector; and slow progress with implementing renewable energy projects (DTI 2006).

climate change (Stern 2006). Stern estimated that unabated climate change could cost the world economy up to 10% of global GDP, with a possible reduction in average global individual consumption of 20%. Written by the former chief economist and senior vice-president of the World Bank, Sir Nicholas Stern, this report prompted an extraordinary volume of coverage and comment, not least in the UK.

Together, these policy developments paved the way in March 2007 for the presentation of the draft Climate Change Bill to Parliament. Although resisting pressure to pledge annual targets for emission reductions, the Bill seeks to make legally binding the government's long-term target of a 60 per cent reduction in carbon emissions by 2050. The Bill will feature interim targets, carbon budgets, an independent Committee on Climate Change and a new system of reporting. It is expected that the Bill will come into force in the summer of 2008.

At the UK level therefore, climate policy and politics has been relatively favourable for municipal governments. There is little by way of party politics over the issue, with the three main parties, Labour, Conservatives, and Liberal Democrats, all supporting action. Public opinion and business groups have been generally supportive, and significant policy innovation has taken place. At the same time, there has been little explicit support for cities to address climate change and our research indicates that in several important ways, national policy, particularly concerning energy, is seen as a barrier to emissions reductions.

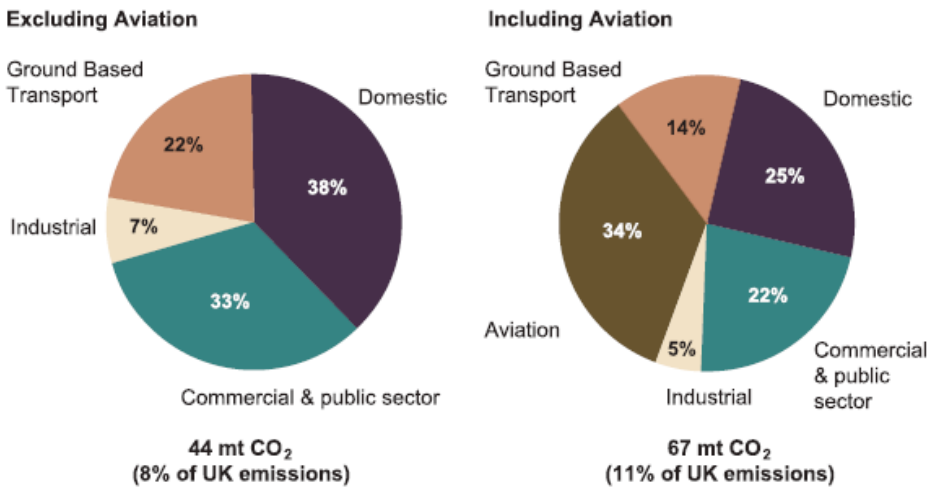
2.2 London's profile

London is the capital of the United Kingdom with a population of 7.7 million, and by 2016 is projected to reach 8.1 million. London's economy contributes 20% to UK GDP, with over a third of the workforce employed in the financial and business services sector. At the same time as it has witnessed strong economic growth, there are areas of significant social and economic deprivation, with five of the ten most deprived local authorities situated in inner London (OEF 2005).

In terms of its administrative make-up, there are thirty-three local councils which make up the greater London area, several of whom have been pioneers in energy and climate change policy. In 2000, a new administrative structure for London – the Greater London Authority – was established with a directly elected Assembly and Mayor, with some autonomy in the areas of energy, planning and transport policy. This has provided the political opportunity to address climate change at the London-wide scale. It is with the climate change policy of the Mayor and the GLA that this report is primarily concerned. In 2000, former Labour Party head of the Greater London Council (abolished in the mid-1980s by the Conservative government of Margaret Thatcher), independent candidate Ken Livingstone was elected as Mayor of London. In 2004, having rejoined the Labour Party, Livingstone was elected for a further term of office. In May 2008, Conservative politician Boris Johnson was elected to the position of Mayor, with, as yet, unknown implications for climate policy in the city. It is on the period 2000 – 2008 that this report focuses.

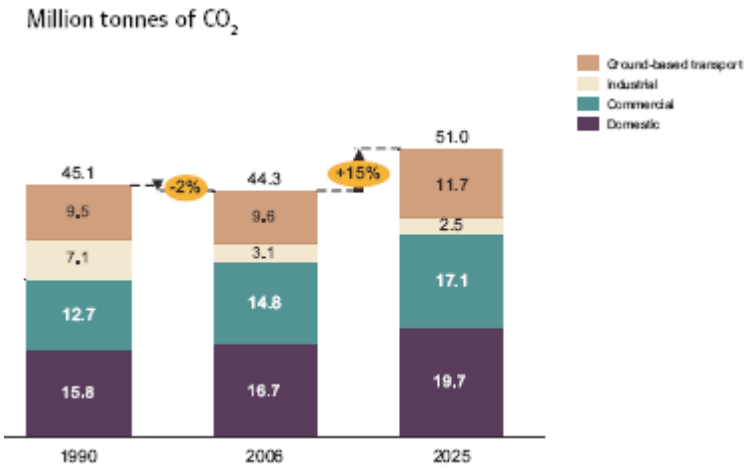
London's emissions of greenhouse gases are substantial and similar to those of some European countries such as "Greece or Portugal" (LCCA 2007, p. 1). In 2006, excluding aviation, carbon dioxide emissions were 44Mt or 8% of the UK's total (GLA 2007; see Figure 1). As shown in Figure 1, the predominant sources of London's emissions of carbon dioxide are the domestic and commercial/public sectors.

Figure 1: London's 2006 carbon dioxide emissions (Source GLA 2007, p.16)



As shown in Figure 2, both domestic and commercial emissions of carbon dioxide are set to increase due to the predicted substantial population and building growth over the next two decades. Excluding aviation, emissions from transport are the third largest contributor but have been stable, though an increase is also predicted in this area by 2025. Industrial emissions are set to decline still further from their 1990 baseline.

Figure 2: London's projected CO2 emissions for 2025 – the business as usual scenario (excluding aviation) (Source: GLA 2007 p.17)



2.3 The evolution of London's climate change policy

The impetus to address climate change within London came directly from the then Mayor, Ken Livingstone, and his office. During his first term, the Mayor developed an Energy Strategy for London (GLA 2004) which placed climate change centre stage (Figure 3). Echoing the main tenants of national policy, it argued that "London should reduce its emissions of carbon dioxide by 20 per cent. Relative to the 1990 level, by 2010 as the crucial first step on a long-term path to a 60 per cent reduction from the 2000 level by 2050" (GLA 2004, p.x). In order to pursue this goal, two strategies were adopted. First, the use of the Mayor's planning powers through the London Plan to promote the use of on-site renewable energy generation (micro-generation) and Combined Heat and Power

(CHP). Second, the formation of the London Energy Partnership, to assess the barriers and opportunities for energy efficiency and renewable energy in London. Also in the Mayor's first term, two other partnerships were formed to address aspects of the climate change challenge: the London Climate Change Partnership (focused on vulnerability and adaptation); and the London Hydrogen Partnership (concerned with research and development for new hydrogen technologies). The focus on partnerships, as examined further below, was testament to the relatively limited ability of the Mayor and the GLA to have a significant impact on the ways in which energy is produced and used in London. Nonetheless, two significant policies were introduced during this period: the Congestion Charge which, while having little overall impact on greenhouse gas emissions, served to provide evidence that difficult policy measures could be implemented, and the London Plan, which contained policies for addressing the emissions from new development (Figure 3).

Figure 3: London's climate policy milestones

Milestone	Goal	Approach
2000 Greater London Assembly and Mayor of London	Strategic oversight of policy issues affecting London.	Directly elected Mayor who appoints a team of policy advisors. GLA members elected and operate with support of civil servants.
2001 London Climate Change Partnership	Assist London in preparing for the impacts of climate change through raising awareness, developing adaptation guidance, and improving the built environment.	Stakeholder group of 30 key government and non-government organisations. Commissions research; develops guidelines; provides responses to national and local policy.
2002 London Hydrogen Partnership	Work towards the establishment of a hydrogen economy for London and the UK.	Stakeholder group supported by a secretariat and working groups. Undertakes research; establishes demonstration projects; disseminates information.
2003 London congestion charge	To reduce congestion and pollution in central London.	A levy is charged on every motorist entering the Congestion Charge Zone in inner-London.
2004 Energy Strategy for London	Reduce emissions of carbon dioxide by 20% below 1990 levels by 2010 as a first step to a reduction of 60% by 2050.	Promotion of energy efficiency and renewable energy through Mayor's planning powers. Mandates the formation of the London Energy Partnership
2004 London Energy Partnership	Assist in the delivery of London's energy policy; provide a single voice for the sustainable energy community in London; create new business opportunities for sustainable energy	Building the knowledge base on the problems and opportunities for sustainable energy in London Seeking to build capacity e.g. training courses, knowledge sharing
2004 London Plan	Provides strategic planning guidance for large-scale projects and for planning policies for borough councils.	Includes measures to promote the generation of 10% of energy from renewable sources on-site for new developments.
2004 Mayoral elections	Mayor Ken Livingstone runs for a second term of office and wins.	Includes a commitment to establish a London Climate Change Agency in manifesto.
2005 London Climate Change Agency	Deliver projects that reduce greenhouse gas emissions from London in the sectors of energy, waste, water and transport.	Established as a municipal company wholly owned and controlled by the London Development Agency (LDA) with private and civil sector support. Develops projects, addresses regulatory and technical issues, seeks to create markets for energy efficiency and renewable energy.
2005 C40 Climate Leadership Group	Promote urban leadership on climate change and establish cost-effective means of addressing the issue.	Membership network of 40 of the world's 'global' cities. Exchange and transfer of best practice. Implementation of projects. Development of the knowledge base. Partnership with the Clinton Climate Initiative.
2007 London Climate Change Action Plan	Stabilise CO2 emissions in 2025 at 60 per cent below 1990 levels, with interim progress towards this goal.	Combination of seeking to change energy infrastructures (technical and regulatory aspects) and promoting changes in practice primarily in the domestic and commercial sectors.
2007 The Greater London Authority Act	Mainstream climate change within the policy framework of the Mayor and the GLA.	Introduces a new duty on the Mayor to prepare and publish climate change mitigation and adaptation strategies. This includes the specific duty to take action

		to mitigate the effects of climate change and help London adapt to its unavoidable impacts.
2008 Further Alterations to the London Plan	Provides strategic planning guidance for large-scale projects and for planning policies for borough councils.	Includes measures to promote a 20% reduction in CO2 emissions from new developments through on site renewables. Introduces a technology hierarchy, so that CCHP technologies should be considered before other forms of power generation.

The second term of office for Ken Livingstone witnessed an important shift in the nature and direction of climate policy (see Figure 3). As one interviewee suggested, after having produced the Energy Strategy as a "broad foundation for what one could do" the Mayor then "decided in the 2004 election that this was going to be the biggest issue of the second Mayoral term, it was the thing that become a personal priority for the Mayor" (Interviewee, December 2007). The development of a Climate Action Plan was regarded as particularly important in providing a strategic framework for climate policy, as a means of uniting disparate initiatives galvanising the administration, including those who were sceptical about London's role in relation to climate change. In 2005, the London Climate Change Agency was formed as one means of delivering this policy framework. Established as "a municipal company wholly owned and controlled by the London Development Agency (LDA) and chaired by the Mayor" with private sector support from "BP, Lafarge, Legal & General, Sir Robert McAlpine, Johnson Matthey, and the City of London Corporation" and the support of "Rockefeller Brothers' Trust, KPMG, Greenpeace, the Climate Group, the Carbon Trust and the Energy Savings Trust" (LCCA 2007, pp. 3-4). While there remains a focus on partnership, with the creation of the LCCA attention has turned to the delivery of climate policy. The final 2007 London Climate Change Action Plan also stresses the means through which various policy initiatives, discussed in more detail below, will be delivered. At the same time, despite a recognition that the 20% goal for 2010 would not be reached, it establishes a more ambitious policy goal, such that the new target "is to stabilise CO2 emissions in 2025 at 60 per cent below 1990 levels, with steady progress towards this over the next 20 years" (GLA 2007, p.19). However, the Action Plan recognizes the "difficult truth is that in preparing this action plan we have been unable to present any realistic scenario in which we can achieve the 2025 target set out above, without major national regulatory and policy change" (GLA 2007, p.19), a point to which we return below.

In effect, the 2007 Action Plan focuses on a target of 30% reduction in carbon dioxide emissions within London by 2025, whilst seeking to achieve policy shifts at other levels of climate governance to enable its more ambitious target to be met. Further, the recent revisions to the London Plan suggest that London's ambitions in this regard may be constrained. Echoing the 2004 Energy Strategy and previous iterations of the London Plan, it states that:

> "The Mayor will work towards the long-term reduction of carbon dioxide emissions by 60 per cent by 2050. The Mayor will and boroughs and other agencies should seek to achieve the following minimum reduction targets for London against a 1990 base; these will be monitored and kept under review: 15% by 2010; 20% by 2015; 25% by 2020; 30% by 2025" (GLA 2008 p.198).

In the absence of any legislative or national policy precedent, legal advice suggested that a target of reducing emissions by 60% by 2025 would be 'open to challenge', leading to a scaling back of the targets in the London Plan. Rather than a reflection of what might be technically achievable, it seems that this shift reflects what was considered to be politically possible – suggesting that what is and is not feasible in municipal climate policy is contested terrain, an issue to which we return below. Nonetheless, over the past eight years London has witnessed a step change in political will, policy attention and project delivery for addressing climate change. The drivers and motivations behind this are necessarily multiple and complex, but include the commitment of critical individuals,

the courage of conviction born in part from interim policy success, a positive climate of public opinion, a lack of overt opposition from key interest groups and the emergence of new market opportunities in the carbon economy (Figure 4).

Figure 4: Drivers and motivations for London's climate change policy

Driver/motivation	Examples
Critical individuals	Mayor, Deputy Mayor, GLA officers, Green Party members, Partnership/Agency Directors
Interim successes	Successful implementation of the congestion charge
Public opinion	From 2004 showed strong support for London action on climate change
Business consensus	Lack of overt opposition from key business/interest groups
Market opportunity	Carbon markets central to City of London; new technologies

On the basis of these drivers and motivations, London has begun to develop a comprehensive approach to climate change. Under the Greater London Authority Act 2007, the Mayor was given a "new statutory duty to contribute towards the mitigation of, or adaptation to, climate change in the UK" (GLA 2008 p.195). As a result, the Mayor is required to "produce statutory strategies for climate change mitigation and energy and for adaptation to climate change in London" (London Plan 2008 p.195). Whilst some of the drivers and motivations may therefore change with the appointment of the new Conservative Mayor, Boris Johnson, the legal requirement to address climate change at least provides a platform upon which to build future strategies.[4]

3. Climate change policy and action

On the basis of the motivations and drivers discussed above, London has over the past eight years established the basis for a comprehensive approach to addressing climate change in the city. Emphasis has been placed on both the need to mitigate and adapt to climate change. This report focuses primarily on policy and action in the arena of mitigation. A number of goals, measures and initiatives have been put into place to reduce emissions of greenhouse gases (Research Question 1; Figure 5). The actions in response to climate change in London can be divided into three categories: an emphasis on leadership; attempts to reconfigure energy infrastructures within the city; and a focus on changing the practices of individuals and corporations. Below we consider the initiatives in Figure 5 in more detail in order to examine the barriers and opportunities that they have encountered (Research Question 2).

Figure 5: London's climate change policy measures and initiatives

Policy initiatives	Founding organisations	Aims	Challenges
Planning – 20% reduction in CO2 emissions through on site renewables	The Mayor and the GLA through the London Plan	To reduce contribution of new development to climate change	Business opposition on basis of technical and financial feasibility; has led to biomass based energy supply and questions over its sustainability
Planning – energy hierarchy	The Mayor and the GLA through the London Plan	To encourage development of CCHP to reduce the carbon intensity of energy supply in London	Business opposition to small scale generation; large scale generation needed to be economically efficient
Energy – 25%	The Mayor and the	To reduce to reduce the carbon	National regulatory barriers;

[4] Note that to date Mayor Johnson has committed London to the target within the London Climate Change Action Plan and to the continued support of the C40 network.

decentralised energy by 2025	LCCA	intensity of energy supply in London and enhance energy security	available technologies; public opinion
Energy – London ESCO	The Mayor and the LCCA	To provide a means through which to deliver decentralised energy projects and establish markets	Some reticence amongst business community concerning the business model and track records of ESCOs
Domestic – DIY Planet Repairs	The GLA	To provide information to educate the public about possible actions	Long history of such campaigns failing to make an impact
Domestic – Green Housing Programme	The Mayor, the GLA and the EST	To provide a single point of delivery for advice and financial assistance for energy efficiency; to target particular groups to take action	Financial security of the programme; skills gap in the supply chain
Domestic – Green Concierge Service	The Mayor, the LCCA and Ten.	To provide a service for those able to pay for energy efficiency improvements to their homes.	Financial security of the programme; skills gap in the supply chain
Commercial – Better Buildings Partnership	The Mayor, the LCCA and several large property businesses	To improve energy efficiency of commercial buildings	Seeking to address landlord/tenant issues; reflecting improvements made in property values
Commercial – Green 500	The Mayor and the LCCA	To provide a recognition package for large public and commercial organisations saving energy	Relevance and uptake; financial security.
Commercial and Public Sector – Building Retrofit Programme	The Mayor, GLA, C40, Clinton Climate Initiative, global ESCOs and banks	To improve energy efficiency in public sector and commercial buildings through energy performance contracting	Roll out and financing beyond pilot buildings; engagement of commercial sector

3.1 Leadership

A concern to provide leadership on the issue of climate change, both within the city and at national and international levels, is a characteristic of the way in which London's approach to climate change has developed. This is evident in three ways. First, as outlined above, it has been the *political leadership* of Ken Livingstone and the then Deputy Mayor, Nicky Gavron, which placed climate change on the policy agenda of the GLA. This has meant that those working to produce and deliver climate change strategy have had the crucial ingredient of political support and have, in turn, led to the formulation of ambitious targets for emissions reductions for London and to the widespread recognition of climate change as a policy issue across the GLA. Second, London has drawn on *business leadership* in the arena of climate change to further support its strategies and plans. With respect to financial institutions, the City of London Corporation has played a role in developing and representing business interests in carbon markets. At the same time, through the inclusion of corporate actors in the London Climate Change Agency and associated initiatives (see Figure 5), the Mayor and the LDA have sought to create a climate of agreement between the public and private sectors about the urgency of the need to address climate change and the potential economic benefits of doing so. Third, *international leadership* has been a key element of London's strategy. Together with The Climate Group, in 2005 London's political leadership established the C20 network of 'global' cities and bought together key cities for a summit on responses to climate change to coincide with the 2005 G8 meeting. Based at the GLA, this network was renamed the C40 as it expanded and has held a number of summits and workshops for members. C40 also works with the Clinton Climate Initiative to put measures in place in its constituent cities to reduce emissions of greenhouse gases. Here, London's role has primarily been one of enabling – establishing a network through which advice, knowledge and finance can flow (see Figure 6). In addition, political capital has also been made of the ways in which London is setting an example to

other ‘global’ cities on climate change, and in particular of how other cities are seeking to learn lessons from London’s approach, e.g. with the congestion charge.

Being able to position London as a global leader on climate change has served to reinforce the need for a cutting-edge and ambitious approach to addressing the issue which has received little in the way of overt criticism or opposition. However, this has been created through a particular constellation of individuals and international opportunity. With the removal of Mayor Ken Livingstone and his Deputy from office following the May 2008 elections, it is unclear whether similar emphasis will be placed on climate change. At the same time, while other cities begin to innovate in the arena of climate policy, London may lose the impetus created by being ‘the leader of the pack’ internationally. Either one or both of these factors could serve to weaken London’s leadership on climate change, such that the creation of ambitious policy goals and the implementation of existing commitments become more difficult to achieve.

Figure 6: Modes of governing climate change

Mode of Governing	Examples
Internal	Organisational performance improvement Demonstration schemes Iconic buildings
Control and compliance	Regulation Planning requirements Contracts Economic instruments
Provision	New infrastructure Low carbon services Public transport
Enabling	Education campaigns Advice Grants Knowledge brokering Planning guidance

3.2 Reconfiguring energy infrastructures

A second notable facet of London’s approach to addressing climate change has been the emphasis on reconfiguring urban infrastructures:

> “The Mayor’s top priority for reducing carbon emissions is to move as much of London as possible away from reliance on the national grid and on to local, lower-carbon energy supply (decentralised energy, including combined cooling heat and power networks, energy from waste, and onsite renewable energy - such as solar panels) … The Mayor’s goal is to enable a quarter of London’s energy supply to be moved off the grid and on to local, decentralised systems by 2025, with more than half of London’s energy being supplied in this way by 2050.” (GLA 2007 p.105)

Delivering decentralised energy generation is recognised as fraught with difficulties – related primarily to national regulation and the nature of the energy market in the UK – yet it is regarded as a cornerstone of any strategy which seeks to deliver substantial reductions in greenhouse gas emissions. In order to accelerate the deployment of decentralised energy systems, London has taken two approaches. First, through a control and compliance mode of governing (Figure 6), the Mayor

has sought to use his powers in the planning system –which include approving large developments and setting the planning framework for London boroughs – to ensure that new developments include decentralised energy generation. Initially the Merton Rule – named after the London borough credited with its innovation – that 10% of predicted energy demand for a new development should be met through on-site generation was integrated into the London Plan, with the caveat that this would only occur 'where feasible'. Subsequent alterations to the London Plan sought to strengthen this approach such that new development would be required to demonstrate that heating, cooling and power systems were selected to minimise carbon dioxide emissions and to reduce emissions of carbon dioxide by 20% through on-site renewable energy generation. Although taking no issue with the importance of climate change and the objective for decentralised energy provision, business interests, through the organisation London First, sought to challenge the way in which this was to be implemented on a 'site by site basis'. This challenge was partially successful. The current version of the London plan states that there should be a presumption that new developments can "achieve a reduction in carbon dioxide emissions of 20% from on site renewable energy generation … unless it can be demonstrated that such provision is not feasible" (GLA 2008 p.205). As this policy is implemented, much will therefore turn on how what is and is not 'feasible' is interpreted. Although potentially significant, there are therefore limits as to how far the Mayor and the GLA will be able to ensure that new decentralised energy systems are delivered through a control/compliance mode of governing. Recognising this, an enabling mode of governance has also been deployed through the development of high-profile projects, backed by the LDA, in order to demonstrate the technical feasibility of such requirements, and also on the training of planning officers with the requisite skills to work with developers to meet the targets[5].

The second approach which has been developed to enhance the delivery of decentralised energy in London relies instead on a provision mode of governing, where desired outcomes in terms of policy goals are achieved through the provision of infrastructures and services which contribute to these aims. Central to this approach has been the formation of the LCCA and the London ESCO:

> "The London ESCO has been established to design, finance, build and operate local decentralised energy systems for both new and existing developments. It has been established as a private limited company with shareholdings jointly owned by the London Climate Change Agency Ltd (with a 19% shareholding) and EDF Energy (Projects) Ltd (with an 81% shareholding)" (LCCA 2007, pp5-6).

Through the London ESCO, the LDA and the Mayor are therefore able to directly provide decentralised energy systems. This has also served as a foil to the concerns of the development industry that the targets for decentralised energy could not be met – the argument is made that the existence of ESCOs means that it is harder to make the argument that such provisions are not 'feasible'. However, this means of providing new forms of energy infrastructure faces challenges in the current landscape of energy regulation in the UK. One key issue relates to the right of consumers to change supplier, at relatively short notice, which could leave ESCOs without the customer base to realise the return on infrastructural investments. Business groups are also concerned that there is a lack of transparency about the services that ESCOs offer, and, at least in some cases, a lack of track record upon which to base the long-term contracts required. Another means through which the provision of decentralised energy generation may emerge is through a proposed Renewable Energy Fund which would allow developers to contribute finance rather than provide renewables on-site, leading, London First suggest, to a system of "strategic decentralised energy provision." (London First 2007, p.1).

[5] We are grateful to Jonathan Gaventa for drawing our attention to this particular point.

The barriers to reconfiguring energy infrastructures in London are multiple and complex. Three of the most significant issues raised by participants were: the regulatory context; the technologies involved in decentralized generation; and perceptions of decentralized energy systems. In relation to the regulatory context, key factors included the low prices paid for the return of any excess electricity to the national grid from such technologies and the limits placed on the use of the 'private wire' system of electricity supply (GLA 2007, p.120). In terms of the technologies involved, concerns were three-fold. As suggested above, business groups decried the potential inefficiency of developing multiple small-scale decentralized energy technologies. A recent scoping study by Buro Happold for London First suggests that meeting the 25% target is equivalent "to 31,250GWh of energy" and that "initial assessments show this equates to 170 schemes of the scale proposed for Olympic Park (a 15MW electrical output), assuming no further growth in energy demand." (Buro Happold 2008 p.11). The suggested solution is to focus on the development of fewer, larger schemes. However, the benefits in terms of economies of scale may be counteracted by potential planning problems in siting such facilities. A further issue was the sustainability, or otherwise, of the technologies currently being deployed, and in particular the use of biomass. Questions were raised over whether or not such schemes were in fact going to lead to emissions reductions. At the same time, the inability to put municipal waste to use in the provision of energy (because of the lack of any influence at the GLA scale over waste policy) was seen as a missed opportunity. The final key issue raised related to the perceptions of the public and the business sector with respect to community-based energy schemes. Unlike elsewhere in Europe, such forms of energy supply are rare in the UK, and have a chequered history which was considered a considerable barrier to their contemporary use.

3.3 Changing practice

The third key element of London's climate change policy is an emphasis on the need to change practice, particularly with respect to energy use in the built environment. Here, the emphasis has been on the use of the enabling mode of governing to shape behaviour and the fabric of buildings, though provision and control/compliance approaches have also been deployed.

Like many governments in the UK and around the world, London has focused at least some of its attention on an education campaign to promote individual action to reduce emissions of greenhouse gases, DIY Planet Repairs. More innovative has been the development of the Green Homes Programme, in collaboration with the UK's Energy Savings Trust. The intention behind this scheme has been to create a coherent package of information, advice and grants directory for the public, to develop the supply chain for 'greening' homes, whilst at the same time undertaking marketing and face to face contact with those individuals seen as most likely to undertake changes within their own homes. In addition, a Green Concierge Service, described as a 'unique partnership for London', has been developed by the Mayor, the LDA and the services company, Ten. For an annual fee of one hundred and ninety-nine pounds, individuals are provided with a home energy audit and concierge services – to assist with the selection and implementation of any energy efficiency or renewable energy schemes which they may wish to pursue. Rather than simply enabling individuals, through offering advice, the GCS seeks to effect reductions of greenhouse gas emissions more directly through providing a specific service. In relation to transport, the control/compliance approach was mooted in the proposal to change individual behaviour by adjusting the congestion charge to reflect the greenhouse gas emissions produced by different vehicles, although this has recently been shelved by incoming Mayor, Boris Johnson.

In relation to corporate and public sector buildings, London's approach under the LCCA Green Organisations programme has been two-fold. The Green500 scheme is a "carbon management service and a performance based awards scheme" aimed at the largest 500 organisations in London in which each member is "assigned a Carbon Mentor who will design a unique, holistic, carbon

management plan" and carbon reduction target[6]. The Better Buildings Partnership is a scheme which seeks to draw together London's leading commercial property owners and tenants in order to overcome barriers to the retrofit of office buildings. Established by the LCCA and the City Corporation of London, current members include British Land, Grosvenor and Land Securities. At least one of the motivations behind the roll-out and adoption of such schemes is the EU Energy Performance in Buildings Directive, where buildings will be given energy performance labels. Equally important, however, was seen to be the rise of climate change on corporate social responsibility agendas. As one interviewee put it, "it doesn't actually matter whether a board believes in climate change, 'cos climate change believes in them and they have no choice but to ensure that they are seen to be taking effective action on climate change."

A further means through which London is seeking to address energy efficiency in commercial and public sector buildings is through it engagement with the C40 network and specifically the Building Retrofit Programme being co-ordinated and delivered by the Clinton Climate Initiative. The programme involves 'the four largest energy services companies (ESCOs) in the world - Honeywell, Johnson Controls, Inc, Siemens and Trane' and 'five major global financial institutions – ABN AMRO, Citi, Deutsche Bank, JPMorgan Chase, and UBS' providing up to $5 billion working in 16 of the cities in the C40 network.[7] The aim is to provide both the expertise – in the form of ESCOs – and the finance to undertake energy efficiency measures at a significant scale in commercial and public sector buildings. The ambition is that 'cities and private building owners will be able to do audits and retrofits of their buildings at no net cost, with paybacks for the bank loans plus interest coming from the energy savings that retrofit projects achieve over several years.'[8] In February 2008, London became the first of the cities to implement this initiative, including a programme with Honeywell to audit and retrofit 22 of Transport for London's buildings.

Such approaches, based primarily on seeking to enable others to take action to change behaviour, inevitably encounter a range of barriers. One issue raised was that of the 'skills gap' in relation to improving the energy efficiency of built environments. While some action has been taken to identify skills shortages and provide training, notably by the London Energy Partnership and through the new Green Homes Progamme, delivering change across a diverse set of supply chains with different training requirements remains challenging. Equally signficant is the material condition of London's existing housing stock, which is older than the UK average and where to date it has been difficult to persuade the utilities to deliver their Energy Efficiency Commitment spending because of the relative expense of achieving efficiency gains. At the same time, while the current policy and financial landscape for the initatives outlined above appears healthy (with £7 million and £1 million allocated to the Green Homes and Green Organisations schemes respectively), in part due to the efforts of London Assembly members of the Green Party, they remain at the margins of policy in London and subject to the vagaries of political whim. Further, given the current global economic climate, the availability of support from global financial institutions for initiatives such as the CCI's Building Retrofit Programme may be in doubt.

4. Working together?

Urban responses to climate change can not be neatly contained within the boundary of the city limits or the corridors of municipal government. Rather, cities such as London are required to work together with a range of partners, with local and national government, and in the context of

[6] See: http://www.londonclimatechange.co.uk/greenorganisations/making-it-happen/green500/
[7] See: http://www.london.gov.uk/mayor/environment/climate-summit/2007/clinton-16052007-factsheet.jsp
[8] See: http://www.london.gov.uk/mayor/environment/climate-summit/2007/clinton-16052007-factsheet.jsp

international policy. These interactions can provide additional barriers and opportunities for action at the city-scale (Research Question 2), as we discuss below.

4.1 Partnership

London's approach to climate change has been explicitly based on partnership. First, a number of partnership organisations – the London Climate Change Partnership, the London Hydrogen Partnership, the London Energy Partnership – have been established to address various elements of the climate change challenge. Second, at the heart of London's approach to implementing climate policy has been a partnership ethos, as embodied in the LCCA and the Green Homes Programme, for example, whereby public and private sector partners are drawn together to implement specific projects. This approach has been developed on the explicit recognition that there are limits to what the Mayor and the GLA can directly achieve with respect to reducing emissions of greenhouse gases.

One of the strengths of London's approach has been the diversity of partnerships which it has developed. This has provided London with both additional resources and expertise. In some cases, these have been rather all encompassing bodies, such as the London Energy Partnership, where multiple actors with a range of commitments come together to build the knowledge base. Here, working in partnership can be a rather slow business, but it serves to ensure that a diverse range of organisations and views are included. Elsewhere, partnerships have been more strategic, so, for example, the LCCA has as its founding partners large business organisations, relevant national government agencies, and non-governmental organisations. Such partnerships serve to cement the consensus that climate change is a problem which London should be addressing. Partnerships have also been used as a policy delivery tool, for example the GCS or the London ESCO. Here, where the powers, influence or know-how of government is limited, private sector partners are bought on board as a means of ensuring effective delivery. A critical factor in the success of London's climate change partnerships has been the willingness of the private sector to become seriously involved. Many participants pointed to the genuine commitment to addressing climate change within London's business community, and the positive impact that London's leadership has had in galvanising action.

Despite its strength as a means of formulating and implementing policy, such a diverse range of partnerships can also be a weakness. Taken together with the networks and partnerships that other organisations based in London have formed, the climate policy landscape is rather crowded and congested. Given that in many cases the time and resources donated are voluntary, this could potentially lead to 'burn out' amongst the many partners involved. Equally, and despite almost universal acceptance of the need to address climate change, divergent agendas amongst partners means that managing and enabling climate governance in this manner is an intensive process.

4.2 Engaging local councils

One group of actors with whom less effective relations have been established are London's thirty-three local or borough councils. Several of these local councils are known for their pioneering work on energy and climate change, including Sutton, Merton, and Richmond. In addition, the City of London Corporation, the local authority for the 'square mile' or financial district, has been particularly notable for its response to climate change. Since 1997, the CLC has undertaken annual reporting of emissions of carbon dioxide and has achieved a 35% reduction over the period. In addition, addressing both the causes and impacts of climate change has become central to the planning approach taken by the local authority. The CLC has also had a particular interest in the development of carbon markets, due to London's financial sector. In 1999, CLC established the UK Emissions Trading Group which was instrumental in setting up UK emissions trading scheme, and

has also been instrumental in bringing global actors together to establish a database of climate knowledge, termed The London Accord. Despite these pioneering approaches, a recent survey suggests that for the majority of London's local authorities, climate change remains some way down the policy agenda. To date, 23 out of 33 have signed up to the national Nottingham Declaration for local councils, 11 have adopted the Merton Rule, with a further 9 considering its implementation, and only six local authorities have a climate change action plan (Church 2008). This was seen to reflect a lack of interest and capacity on issues of climate change at the local level, and a degree of party politics, so that Conservative (mainly suburban) boroughs have been less willing to engage with the agenda of the GLA than inner-city Labour authorities.

Furthermore, there is little evidence as to whether the policy and actions taking place at the GLA level with respect to climate change are making a difference to local councils. With the exception of providing direction to local level planning and through the development of public transport, there are few direct means through which the Mayor, the GLA and the LDA can effect action at a local level. Rather, local councils are primarily driven by their responsibilities in relation to performance indicators and local area agreements negotiated directly with central government and in which climate change plays only a minor role. Even in relation to planning, the Mayor's powers are limited to providing direction for Local Development Frameworks, which must be in 'general conformity' with the London Plan[9]. While there is evidence that some local councils are taking significant steps to address climate change, there remains a disjuncture between what local councils are doing and the ambitions of London's climate policy. This was seen as particularly significant in relation to waste where, in the absence of any London-wide strategy or responsibilities policies to generate energy from waste flounder. As the reconfiguration of London's energy infrastructures gathers pace, in the absence of the greater involvement of local councils in London's climate change agenda, sticking points could emerge between establishing decentralised energy generation and the wishes of local councils and local communities.

4.3 Reliance on national government

The Climate Change Action Plan candidly demonstrates the significant role that national government has in shaping the opportunities for addressing climate change in London:

> "The difficult truth is that in preparing this action plan we have been unable to present any realistic scenario in which we can achieve the 2025 target set out above, without major national regulatory and policy change" (GLA 2007 p.19)

The Plan goes on to establish that, without concerted national level action, only half of its target of a 60% reduction in carbon dioxide emissions by 2025 will be achievable. There were three aspects of the role of national government which were seen as critical in shaping the possibilities for action. First, in relation to legislation. The existence of national policy and measures with respect to planning (e.g. improving the energy efficiency standards of new buildings) and business (e.g. the Carbon Reduction Commitment) were seen to provide drivers for action amongst actors – particularly businesses – that London has sought to involve in policies and projects. The absence of appropriate regulation in key areas – particularly with regard to energy generation and supply – was perceived as a major barrier to radical reductions in greenhouse gas emissions. The second critical aspect of national government's role was its relation to establishing a viable and stable market price for carbon. A 'bold and clear' strategy on carbon pricing, and its implications for businesses and consumers, was seen as necessary to create an economic case for investment in energy efficiency and new energy generation technologies. Third, the issue of the circumscription of London's powers was seen as a critical issue, particularly in relation to waste. Strong arguments were

[9] We are grateful to Jonathan Gaventa for drawing our attention to this specific point.

repeatedly made about the need to create a single waste authority for London in order to realise the potential for creating energy from waste.

5. International climate policy and the 'new global'

The third research question posed by this project relates to the significance of post-2012 climate policy for global cities, and how developments at the urban level might affect international climate policy. In London, in contrast to the importance of relationships with partners, local councils and national government, the international climate policy arena was seen to have less *direct* impact on London's climate change policy response. The role of climate science was seen as crucial – both in having given the Mayor, Ken Livingstone, the conviction that climate change was an urgent problem, and in providing the justification for the radical policy position taken. The international negotiations, and in particular the detail of what was or was not to be included in a post-Kyoto agreement, was seen to be of little significance.

However, the *indirect* impact of international climate policy was notable. First, the presence of an international target and timetable was largely taken for granted as the context within which London's policy and measures will be implemented. While the exact nature of the target and timetable for compliance appears to be of little relevance in London, having such a target appears to be a crucial driver for local action. In as much as the international policy framework shapes action at the EU level, this was also seen as important for the possibilities of taking action on climate change in London. Several EU policies and measures were mentioned as important drivers for action amongst public and private sector organisations in the city. The position adopted by the EU is therefore likely to have significant impacts on London's future progress in response to climate change. Given the significance of national policy for the implementation of London's strategies, discussed above, the UK's position with regard to the post-2012 framework, in terms of the targets it adopts, will also be important.

Second, membership in the international agreement and carbon finance were also of indirect importance to the climate policy of the Mayor and the GLA. Both factors have the potential to shape the stability, or otherwise, of the international policy framework which was regarded as a critical issue for London's business community. Given that a lack of overt conflict over the implementation of climate policy and partnerships with business organisations have been critical to London's approach, the ways in which the international policy framework post-2012 will affect London's key business sectors (in particular financial services and property development) will be important. However, outside of the City of London Corporation, there was no direct concern with the exact nature of future carbon markets, or any explicit interest in the possibilities of entering into emissions trading. There was, however, some interest expressed in establishing forms of voluntary offsetting within London, so that companies and individuals seeking to offset their emissions of greenhouse gases could do so within London.

Despite the potential importance of the international climate change policy in providing a framework for action, one striking finding was the way in which the *failings* of the global community to address climate change were providing a more direct impetus for action. As one interviewee put it, "there's no point in waiting for national government, no point in waiting for Europe, no point in waiting for international agreements. Obviously they are important in the long term, [but] all that's been far to slow…you know we'll all be dead by the time anything's arrived". Instead, urban responses to climate change were viewed as more dynamic, and, as the source of a significant proportion of carbon dioxide emissions, more effective.

At the same time, London's response to climate change has been predicated on the creation of an alternative, 'global', response to climate change, and one in which it is positioned as a leading actor.

Here, the role of C40 was seen as significant, and the ability to build a coalition of cities - where there were few arguments about who should do what and why - imperative in providing a truly 'global' response to the problem of climate change. The engagement with cities including Stockholm, Copenhagen, San Fransisco, Berlin, New York, and Paris in a deliberate strategy of seeking to 'copy the best' in London was regarded as 'utterly instrumental' in the development of London's own climate policy framework and as providing the basis for the development of C40. Such a network could have significant implications for the post-2012 international framework by bringing climate change mitigation efforts into the major cities of countries, such as Mexico, India, China, Brazil, South Korea, and South Africa, which have to date not carried any international obligations to reduce emissions of greenhouse gases. This could, on the one hand, lay the groundwork for national governments to take up specific targets and timetables in the post-2012 period and/or open up opportunities for carbon finance or adaptation measures. On the other hand, such a network could be regarded as a substitute for national action, so that such countries remain outside of the commitment framework post-2012. Through its role in establishing and guiding the C40 network, London has the potential for significant influence in this regard.

6. Conclusions: winning half the battle?

In the Climate Change Action Plan 2007, London candidly admits that it can only achieve half of its ambitious policy goal of a reduction in carbon dioxide emissions by 60% by 2025 without central government. Half the battle, then is acknowledged to lie outside London's direct influence. However, significant questions remain as to whether London can achieve the more modest, but still substantial, goal of reducing emissions of carbon dioxide by 30% over the next 20 years.

Arguably, the skeleton of an ambitious and progressive climate policy has been put into place over the past eight years (Figure 3). There is strategic vision in relation to both climate adaptation and mitigation, and a range of policy innovations across all four modes of governance (Figures 5 and 6) are visible. The challenges lie in moving from this strategic vision into action. The 2004 Energy Strategy serves as a salutary reminder that ambitious targets are not the same as significant achievements: the target for a 20% reduction in greenhouse gas emissions on 1990 levels by 2010 has been abandoned. While the ambition of reducing emissions of carbon dioxide by 60% by 2050 is laudable, perhaps the most challenging aspect will be to keep to the interim targets set out in the London Plan (see above). This will involve sustained leadership, across party political divides. It will require a step-change in London's infrastructures, particularly with regard to the energy efficiency of the built environment and the delivery of energy services. It involves changes in the practices of individuals and businesses which, on the face of it, may seem rather minor (switching lights out, buying more energy efficient appliances), but reflect more deeply ingrained conventions about the ways in which we use energy (Shove 2003). Perhaps most significantly, it requires working across and between different levels of government, and between public and private sector actors. There is evidence that these challenges are recognised in London's approach to governing climate change, and indeed there are several examples, discussed above, in which such issues are being addressed head on. However, at the moment climate change policy remains in its infancy, and, despite being written into the statue books, its future remains uncertain.

As regards the impacts of, and influence upon, the post-2012 international climate policy framework, three conclusions from this report are particularly salient. First, the specific details of any international agreement are of less importance than its general features. In short, for London, any agreement will be better than none. Second, any such agreement is likely to have an *indirect* but still significant impact on London's climate policy, in particular because of its importance of shaping the climate policy positions of the EU and UK government, and the nature of business engagement on the issue. Third, London's influence on the international policy framework is also

rather indirect. Through the establishment and sponsoring of the C40 network, London, together with other global cities, may be affecting the tenor of domestic climate politics in several countries which will be critical to the make-up of the post-2012 policy framework. In this manner, a non (nation) state actor such as London may be significant beyond its jurisdictional realm.

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