Climate Change and the Role of Spatial Planning in England

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Abstract The evidence gathered from academic literature and policy sources leave little doubt that the planning system has a major part to play in climate change policy agenda. However, the extent to which spatial planning in England has leverage in tackling climate change depends largely on how broadly it is defined and what level and types of interventions, tools and resources are available to it. Adopting a broader definition of spatial planning, its place-shaping role can be practised in three interrelated ways: *proactive interventions* in the way places are developed; *regulatory interventions* in how others undertake their own activities; and *strategic coordination,* which enables participation and policy integration. Over the past decade, national policy expectations from planning to respond to climate change have grown considerably, and the role of planning has been elevated from promoting climate protection to ensuring policy delivery. However, less attention has been paid to how its role can be framed. The bewildering array of tasks allocated to planning in both policy documents and academic literature can take away the urgency of the response and the need to focus on critical climate policies in which planning can be most effective. Hence, by classifying climate policies into the three key areas of *energy supply, energy demand and adaptation,* this chapter aims to identify policy areas that are most relevant to planning intervention for each category. Based on this approach, the chapter provides a conceptual framework by mapping the three policy areas against the three types of planning interventions mentioned above.

Keywords Spatial planning · Climate change mitigation · Climate change adaptation · Governance · England

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1 Introduction

In its broader definition, planning is often understood as place governance. As such, there is little doubt that it has an important part to play in climate change policy agenda. Over the past decade in England, national policy expectations from planning to respond to climate change challenges have grown considerably, and the role of planning has been elevated from merely *promoting* climate protection to *delivering* governments' wider climate policy objectives. Spatial planning is considered to be one of the policy areas with leverage in both mitigation and adaptation to climate change. Indeed, some argue that spatial planning can be the strategic framework through which both are positioned in the broader perspective of sustainable development (Davoudi et al. 2009; Biesbroek et al. 2009). Such a role has been formalised through a series of national policies, which have made the planning delivery of the UK government's climate change strategies a statutory requirement. However, the bewildering array of tasks allocated to planning in both policy documents and academic literature has created a large degree of confusion about what is critical and where the focus should be placed. The aim of this chapter is to provide a framework for better understanding of the role of spatial planning in the mitigation and adaptation to climate change. The framework (see Table 1) is developed by mapping three aspects of planning interventions (pro-active, regulatory and strategic coordination) against the three critical climate policies in which planning can be most effective (energy supply, energy demand and adaptation).

2 The UK Climate Policy Context

In responding to international targets, the UK has cut its emissions to 21 % below 1990 levels. Furthermore, the UK Climate Change Act 2008 has set a statutory target to reduce greenhouse gas (GHG) emissions by 80 % below 1990 levels by 2050. Since the 1990s, spatial planning has been expected to play a significant role in the delivery of sustainable development through policies such as: mixed use development, better design standards and reducing the need to travel, all of which were justified in terms of their potential for GHG reduction. However, even as late as 2008, progress on integrating climate change considerations into planning was slow and limited to some specific sites, leading to "a sense of implementation deficit" (Owen and Cowell 2002), which was partly due to the lack of a clear and explicit national policy. In the mid 2000s, legislative changes to the planning system placed climate change more firmly at the centre of the spatial planning agenda. However, emphasis remained on 'softer' measures of, for example, "promoting or encouraging the use of renewable energy in new developments and reducing the use of non-renewable resources" (DEFRA 2005a: 88–89), in line with the negotiation mode of governance. This softer language was later

Table 1 Spatial planning interventions and critical climate change policies

			Types of planning interventions		
			Proactive tools Plans, strategies, guidelines; resource mobilisation	*Regulatory tools* Development control/ planning gain negotiation	*Strategic coordination tools* Consultation/ collaboration
Key climate change policies	*Energy supply* (*mitigation*)	Large renewables	Site allocation/identification	Infrastructure Planning Commission	Renewable energy industry/ local communities, etc.
		Small renewables and micros	Specific requirements (e.g. Merton Rule)	Permitted development	
	Energy demand (*mitigation*)	Reducing travel	Settlement size, density, mixed use location and accessibility, parking		Developers/transport authorities, etc.
		Energy efficiency		Planning conditions Code for Sustainable Homes	
	Adaptation	Flood risk	Protecting flood plains from development		Environment agency/ developers
		Heat wave	Protecting and enhancing green infrastructure	Planning conditions Design standards	

strengthened by the more robust vocabulary of the subsequent national planning guideline, which stated that: "local planning authorities should *ensure* that development plans contribute to global sustainability by addressing the causes and potential impacts of climate change" (ODPM 2005a: 13). The explicit expectation from planning has since been recognised in the UK Climate Impact Programme 2006 (DEFRA 2006) and heightened by the subsequent national planning guidelines to stress that, if planning is used positively, it can play a pivotal and significant role in the climate change agenda (DCLG 2007). Overall, not only the expectations from planning have increased, but also its role has been elevated from being a *facilitator* and promoter of climate protection to one which should ensure policy *delivery*. However, the extent to which spatial planning can play a role in tackling climate change depends largely on how broadly it is defined, and what level and types of interventions, tools and resources are available to it to pursue the tasks expected from it, and how well its measures are integrated and coordinated with other policy areas.

3 The English Planning System

The planning system in England (and the rest of the UK) has evolved considerably since the introduction of the 1947 Town and Country Planning Act. As a result, the balance between proactive, strategic and forward-looking dimensions of planning (often represented by the development plan system) and its site-specific, regulatory dimension (often represented by the development control system) has fluctuated over time. In the late 1990s, this balance shifted towards the former and, in 2004, after a legislative change, the pursuit of sustainable development became a statutory purpose of the planning system. At the time, the scope of planning was also extended from a narrow *land use* regulation to the broader *spatial* planning with a focus on place governance.

3.1 Planning Interventions

In analysing the role of the planning system in climate protection, this chapter, in line with the UK government policy and the broader governance literature (see Davoudi et al. 2008), defines planning as place governance; as an activity engaged in collaborative actions to make better and more sustainable places. Adopting this broader definition of planning implies that its place-shaping role can be practised in three interrelated ways (see UN-Habitat 2009, Chap. 4):

- proactive interventions in the way places are developed;
- regulatory interventions in how others undertake their own activities;
- strategic coordination that enables participation and policy integration.

Planning's *proactive interventions* use mechanisms, such as identifying spatial opportunities and constraints for land allocation for specific uses and/or land assembly for major development projects. Planning's *regulatory interventions,* although often portrayed as negative restriction, have both protective and developmental intent. *Protective* regulation is justified on the basis of safeguarding assets, social opportunities and environmental resources, and reducing vulnerability to climate change risks; all of which would otherwise be squeezed out in the rush to develop. The justification for *developmental* regulation is to: promote better standards of building and area design; enhance quality of life and public realm, introduce a degree of stabilisation in the urban development process and; deliver the required infrastructures for transition to a low-carbon economy and adaptation to climate change. However, in social democratic societies such as the UK, where a free market economy prevails, government's and, by extension, planning interventions can succeed in delivering change only if they are undertaken in partnership with the private sector and through public engagement. The need for such partnership and for considering the implications of individual policy sectors for the quality of specific places provides the justification for planning's *strategic coordination.* This is about bringing together multiple policies and stakeholders, and coordinating their activities in specific places. Assigning such a strategic role to planning was reflected in the mid 2000s' reforms of the planning system.[1]

3.2 Planning Tools and Resources

The various forms of planning interventions mentioned above are achieved by drawing on a set of tools (Vigar et al. 2000). These tools can be consolidated into four types: strategies and plans; regulatory measures (in line with formal, hierarchical mode of governance); resource mobilisation (in line with market stimulation mode of governance) and; consultation and collaborative practices (in line with negotiation mode of governance).

As suggested by Hopkins (2001, Chap. 3), plans can perform tasks such as providing: a list of actions to be undertaken (an agenda); principles or rules to guide subsequent actions (a policy statement); an image of what could come about (a vision); a fully-worked out development scheme (a design); and/or guidance on sets of interrelated decisions about current action linked to specific contingencies anticipated in the future (a strategy). The power of a plan has a lot to do with the authority accorded to it in formal law or through national government policy. Hence, in planning systems where the right to develop is enshrined in a zoning

[1] It should be noted that in 2011 the UK Coalition government reformed the planning system through the Localism Act, 2011. This reduced the strategic capacity of spatial planning in line with the abolition of the regional tier of planning and all key performance targets which local authorities had to produce with regard to a number of national policy priorities including climate change adaptation.

ordinance (such as parts of the United States), those plans that express this carry a lot of weight in deciding what can take place on an individual plot. In more discretionary systems (such as in the UK), plans are more of a statement of what the local government wishes to see happen in a place. This, however, can be an important point of reference for shaping the decision of those involved in development.

The effectiveness of spatial planning is often dependent on the careful linkage between actions indicated in plans and strategies, the use of regulatory instruments, and the provision and mobilisation of human and other resources that are needed to carry a strategy forward. Weakness in such linkages has, in the past, led to inadequate policy implementation. As a result, although sustainable development has been adopted on a statutory basis in the planning system, this has not always been matched by its outcomes in terms of dominant development processes (Davoudi and Layard 2001).

The discursive shift from sustainability to climate change has once again encouraged planners to re-think their processes, methods, skills and even perception of what constitute 'good places' (Davoudi 2012). Consecutive national policy changes and the introduction of mechanisms, such as sustainability appraisal of plans, have also helped embedding sustainability and, increasingly, climate change issues into the planning framework (Davoudi et al. 2009). However, the growing range of issues with which planning has to grapple has not been matched with the level of resources allocated to it. This is particularly the case in terms of insufficient numbers of appropriately trained planners (DCLG 2004). One area which is reportedly under-resourced is enforcement and monitoring (Rydin 2009), both of which are crucial for implementation.

4 The Role of Spatial Planning in Climate Change

Since the mid 2000s, a number of national guidelines have been issued, each prescribing a new set of roles for planning in relation to climate change. For example, in 2007 a national policy guideline considered the role of planning to be five-fold: "secure enduring progress against the UK's emissions targets […]; deliver the government's ambition of zero carbon development; shape sustainable communities that are resilient […]; create an attractive environment for innovation […] in renewable and low-carbon technologies […]; and capture local enthusiasm and give local communities real opportunities to influence and take action on climate change" (DCLG 2007: 7). An earlier government's best practice advice had identified a longer list of actions for planning related to: the built environment (six actions); infrastructure (five actions); location (two actions) and; rural environment and land use (eight actions). The actions range from consideration of passive solar gain, through flood risk and water resources as well as local food markets (ODPM 2004: 29–31). While these indicate the breadth of the planning role in the climate change agenda, their sheer volume and their seemingly random

selection makes it difficult to understand what planning can exactly achieve and in which areas of climate policy planning interventions can be most effective. Following Bulkeley (2006), this chapter attempts to group the wide range of actions and tasks—which are expected to be delivered or enabled by the planning system—into three broad and critical climate policy areas, including: energy supply, energy demand and adaptation. In discussing these areas, references will be made to the three types of planning interventions, discussed above, in order to provide a better understanding of which type of intervention may be used in which area of climate policy to produce more effective results (see also Table 1 for summary).

4.1 Planning and Renewable Energy Supply

Mitigating climate change requires a shift in the balance of energy supply from fossil fuels towards other sources, notably the renewable energy sources covering electricity, heat and transport. Under the agreement to drive the uptake of renewable energy across Europe, 15 % of energy in the UK must be renewable by 2020. It is in this area of climate policy where the planning system has a particularly proactive role. But, paradoxically, it is also here that the planning system has been framed as 'part of the problem.' For example, the UK Renewable Energy Strategy, which sets out the path to meet the legally-binding targets, discusses the role of planning under the heading of "drive delivery and clear away *barriers*" (HM Government 2009a, emphasis added). This echoes previous perceptions of planning as a barrier, as reflected in the Energy White Paper (DTI 2003), which called for planning to be 'streamlined and simplified' as well as a follow-on national planning guideline which required that, "local development documents should contain policies designed to promote and encourage, rather than *restrict*, the development of renewable energy sources" (ODPM 2005b, 1.2, emphasis added).

4.1.1 Large-Scale Renewable Energy Supply

The framing of the planning system as a barrier has largely been due to delays in processing and often rejection of planning applications for larger renewable energy facilities, notably wind farms. This in turn has been due to local opposition and spatial disputes. The success rate for wind farm application in England and Wales is only 40 % (Toke 2003). While local opposition is often dismissed as 'Nimbyism,' numerous academic studies have suggested that the reasons for protest are not straightforward and depend on where, when and how people have been engaged in decision-making processes (Wolsink 2007). Similar conclusions are derived from research on other forms of renewable energies as well as other major infrastructure developments, notably those related to waste management (Davoudi and Evans 2005). They all highlight that framing the role of spatial planning as a top-down delivery system for national policy objectives and targets is inadequate.

They argue that, in practice, local planning is enmeshed in a complex process of negotiation with multiple stakeholders and balancing of multiple and often competing policy interests (Haggett 2009). Partly due to perceived failure of local planning in delivering renewable energy, decisions on major infrastructures, including large renewable energy facilities,[2] are now dealt with at the national level.

To ensure a proactive approach to renewable energy supply, a multi-level governance arrangement has been enacted where regions are expected to set targets in line with national targets or better. Similarly, local planning authorities are expected to go beyond encouraging the development of renewable energies to meet specific targets for new capacities. These provisions have been strengthened by the UK Renewable Energy Strategy (HM Government 2009a), which put forward a number of measures aimed at "swifter delivery"[3]; i.e. mainly focusing on providing more flexibility in planning's regulatory interventions. As regards strengthening planning's proactive interventions, the Strategy emphasises that "effective and proactive strategic planning […] is […] vital if we are to capitalise on the renewable opportunities" (ibid.: 78). Mindful of the contested nature of local planning decisions and the continuing conflict of interests over the right balance of local and national priorities as well as costs and benefits of development, the Strategy then goes on to stress that, "key to this will be a transparent, robust and evidence-based process in which individuals, communities, developers and planners can engage" (ibid.). This not only shows that strategic planning is a collaborative process, but also reveals the limitation to its proactive capacity.

4.1.2 Small-Scale Renewable Energy Supply

As regards smaller, on-site, renewable energy facilities, in the 2000s the local government has been the most proactive level of governance in initiating innovative planning responses and in drawing explicitly on the strategic *coordination and enabling* role of spatial planning. Such innovations have challenged the framing of the planning system as a mere delivery mechanism for national policy. The bottom-up initiatives have used the developmental intent of planning's regulatory interventions to generate renewable energy, focusing on specific sites and technologies. The most notable example is 'The Merton Rule,'[4] which requires the incorporation of at least 10 % (of estimated energy requirement) in developments of over 1,000 m^2. The Rule has been implemented by an estimated 100 local

[2] This includes renewable electricity generating plants of over 50 MW onshore and 100 MW offshore in England and the adjacent offshore Renewable Energy Zone (HM Government 2009b: 73).

[3] This is the title of Chap.4 of the Strategy, which deals with planning issues on p. 70.

[4] This was devised by planners in the London Borough of Merton as a form of planning condition for new developments of over 1,000 m^2.

authorities (LGA 2007: 34), with more signing up to its dedicated website[5] and some (notably London) raising their target to 20 %. These local initiatives went beyond the national guideline, which required for an undefined percentage of the energy to be used in new developments and only if it does not put "undue burden on developers" (ODPM 2005b: 8). However, national policy has since been widened, and there is also a wealth of local planning guidelines, which provides advice on climate change mitigation measures to planning applicants (see Rydin 2009 for a list).

To sum up, attempts at tapping into the *proactive* potential of the planning system have been hampered by its limited leverage in bringing forward development projects to meet the national or local targets for renewable energy. Key decisions over energy infrastructure are taken nationally so, without a strong national and local coalition of values in favour of decarbonising the UK economy, planning's proactive interventions will continue to face challenges from other competing demands.

4.2 Planning and Efficiency in Energy Demand

Transforming the UK into a low-carbon economy requires policies and actions that are aimed at not only increasing the supply of low carbon and renewable energy, but also substantially reducing energy demand. Managing energy demand through land use policies has been a major part of planning's sustainable development objective since the 1990s, as mentioned earlier. Two areas in particular have been at the centre of attention. One is the need to reduce car travel through policies on the location of new development and accessibility, and the other is to increase energy efficiency of the built environment through design policies and the layout of new developments.

4.2.1 Reducing Car Travel

Numerous studies have tried to establish the link between urban form, land use and travel patterns. While socio-economic variables often explain the variation in trip-making more significantly than the land use factors (Hickman and Banister 2005), evidence shows that at the regional and city levels, three land use characteristics have major impacts on travel behaviour. These are density of development, settlement size and access to facilities and services (Banister and Anable 2009), with density having a greater impact than settlement size in encouraging walking and cycling. The much-cited research by Newman and Kenworthy (1999), which

[5] www.themertonrule.org.uk.

compared 84 cities, has shown that density has an important impact on the distances travelled, too.

The main conclusions with regard to the impacts of land use factors on travel behaviour is that, although planning may have a limited role in the short term, compared with fiscal measures, it certainly has a more significant role in the longer term. This can be achieved through: fostering sustainable location choices; facilitating other policy areas and; acting as a complementary policy for technologically-driven and demand-management policies so that their benefits are locked in. Furthermore, given the unequal distribution of GHG emissions from personal travel in the UK (Brand and Boardman 2008), the role of planning in providing for local services and access to them by sustainable modes of transport is pivotal to ensure accessibility for lower income groups. Overall, there is now compelling evidence which shows that the future location of new housing and other developments in the UK has substantial implications for: the level of demand on transport systems, journey distances and the use of different modes of transport (Banister and Anable 2009).

4.2.2 Increasing Energy Efficiency of the Built Environment

Here, the role of spatial planning relates to three areas: firstly, the location, layout, landscaping and site design for new development; secondly, the design of individual buildings and; thirdly, the environmental standards of larger developments, such as the ecotowns.

Planning provisions for increasing the efficiency of new buildings date back to the late 1990s when pioneering local authorities (such as Newcastle) incorporated energy efficiency measures in their development plans. Such practices became more widespread across the UK following publication of a national planning guideline on housing, which suggested that planning authorities should "promote the energy efficiency of new housing where possible" (DETR 2000: 3). However, the scope for planning intervention in this area remained limited, as the standards of design in new buildings are controlled by the Building Regulations. While steps have been taken to revise the Regulations to achieve more sustainable design and construction, until recently progress has been limited.[6] Hence, this has left a regulatory gap into which the planning system has gradually moved. The main shift came in 2006 when the government introduced a package of measures aimed at achieving zero-carbon homes by 2016. Part of this package was the Code for Sustainable Homes.[7] Although achieving specific rating of the Code is voluntary, all new buildings have to be assessed against the Code as part of the planning

[6] A new version with more stringent energy efficiency measures in Part L took effect in 2006. These increase the efficiency standards by 40 % over 2002 levels.

[7] A government-endorsed rating system for new housing with the sixth star of rating awarded to zero-carbon development (DCLG 2006).

permission process. This has signalled the recognition of the regulatory potential of spatial planning, which can go beyond the provisions of the Building Regulations and can also be extended to issues such as connection to Combined Heat and Power schemes. Furthermore, the critical role of the planning system is strategic coordination to bring together interested parties to facilitate the establishment of decentralised energy systems.

New developments with major planning inputs are also being piloted to meet the highest environmental standards on a large scale, notably: the ecotowns, the Thames Gateway ecoregion and the London Olympic Park. Ecotowns are new settlements,[8] promoted primarily as part of meeting the government target to build 240,000 new homes per annum by 2016. In doing so, they are required to achieve zero-carbon emission. Whilst there are some concerns over the proposed location of ecotowns, they will provide learning for planners and others involved about new ways of decarbonising existing communities.

The preceding account shows that attentions so far have been put largely on new development. It may be true that, "if we build the houses we need, then by 2050 as much as one-third of the total housing stock will have been built between now and then" (DCLG 2007: 5), but this means that two-thirds of the dwellings in 2050 have already been built. Improving the energy efficiency of the existing building stock is therefore paramount. As the government's statistics show,[9] there is a long way to go in making progress to 2020 and beyond. Planning's regulatory intervention along with the appropriate financial incentives can be drawn upon to move this agenda forward. This is already taking place at the local level, where cost-effective energy efficiency measures are carried out for the existing building as a condition of planning consent for a home extension. Others have suggested more drastic measures, arguing that meeting the national target for GHG emissions in the housing sector requires demolition of 80,000 dwellings per year (Boardman 2007). The role of spatial planning in this area is not limited to regulatory measures deployed at the point of planning consents. It also extends to more strategic interventions within the framework of urban regeneration. In fact, "there may be scope for returning to some of the ideas of the 1970s concerned with housing improvement and bringing together housing and planning policy in new ways" (Rydin 2009). Similar place-making endeavours can be sought in commercial areas in the context of town centre management.

However, the potential for spatial planning to reduce emissions, or indeed achieve other sustainability objectives, has been persistently undermined by an overriding expectation from the planning system to provide for predicted demand for growth of: housing, economic activity, traffic volume, waste generation, construction activity, out-of-town shopping, and so on (Davoudi et al. 2009). Such

[8] For pros and cons of new settlement versus other forms of accommodating growth (such as urban infill and urban extension), see Green and Handley (2009).

[9] Almost two-thirds of cavity walls are filled in the UK and only 35 % of lofts are insulated to at least 150 mm, with the figures in private rented sector as low as 21 % (HM Government 2009b: 83).

potential may be further hampered as a result of the current economic recession, as the emphasis is not just on providing for, but also stimulating, demand.

5 Planning and Adaptation to Climate Change

The UK is already experiencing the impacts of climate change, including extreme weather events, such as the 2007 summer floods, the 2004–2006 drought and the 2003 heat wave. The Association of British Insurers has estimated that claims for storm and flood damages in the UK doubled to over £ 6 billion over the period 1998–2003, with the prospect of a further tripling by 2050 (ABI 2004). Adapting to these inevitable impacts of climate change is another area in which spatial planning has a significant role to play. Evidence on the extent to which planning has become engaged with adaptation is mixed. While some criticise planners for being fixated on mitigation to the near exclusion of adaptation (LGA 2007), others disapprove of them for not paying enough attention to mitigation policies (Howard 2009). However, the emerging consensus is that emphasis should be placed on integrating both measures and ensuring that adaptation policies do not jeopardise, in the long term, the efforts for mitigating the causes of climate change.

Four areas of climate risk have been at the centre of adaptation efforts. These are related to the risk of: flooding; coastal erosion; heat waves and; drought (particularly in the south of England). The role of spatial planning has been mainly related to: (a) the location of new development away from the areas of risk; (b) the design and layout of buildings and urban areas which are resilient, and; (c) the promotion of sustainable water management in new developments. The focus here will be on issues around flood risks and heat waves, which have attracted substantial attention.

5.1 Flood Risks

In England, planning policy on flood risk was first introduced in 1992. Its subsequent revision in 2001 made it clear that "the susceptibility to flooding is material planning consideration" and planners should "consider how a changing climate is expected to affect the risk of flooding over the lifetime of developments" (DETR 2001: 4). This was issued well before the Foresight Future Flooding study (DTI 2004), which led to a major reframing of government's long-term strategy for flood risks and coastal erosion. Instead of focusing only on building flood defences, attentions were placed on recognising the need for *Making Space for Water* (DEFRA 2005b) and protecting floodplains from development. Spatial planning decisions can influence both the probability of flooding and its consequences. As regards the former, planners are required to adopt a 'risk-based' approach "to ensure that flood risk is taken into account at all stages in the

planning process to avoid inappropriate development in areas at risk of flooding and to direct development away from areas at highest risk," (DCLG 2010). Development plans have to conduct a sequential test to steer new development towards the lowest probability flood zones, identified in Strategic Flood Risk Assessment (SFRA) based on the Environment Agency Flood Maps. Also, planning applications have to be supported by flood risk assessment. By 2009, 85 % of local authorities had completed a SFRA and, in over 96 % of cases where the Environment Agency has objected to planning applications on flood risk grounds, the final decision was in line with the Agency advice.

Despite all this, development still occurs in 'at-risk' areas. While some criticise local planning decisions for allowing development to go ahead on floodplains, others criticise national planning policy for being too "restrictive" and inflexible in "areas that have limited land available for development" (DCLG 2006) particularly for the provision of much-needed housing. This clearly shows the contested context within which planning decisions have to be made. It also shows that planning can not only use its regulatory tools to protect 'at-risk' areas, but also its collaborative practices to provide arenas for discussing different sides of the arguments, and negotiating the terms upon which trade-offs need to be made.

5.2 Heat Waves

As regards the risk of heat waves, the headline for spatial planning is the urban heat islands. This refers to the several degrees warmer air temperature in urban areas compared with the countryside, due partly to the surface cover. The urban heat island effect in turn has a major impact on human health, energy use and biodiversity. According to the Urban Environment Report (RCEP 2007), urban heat islands can be classed as 'systemic' rather than 'cumulative' issues; the distinction being centred on whether the issues apply to all settlements or mainly to towns and cities. As a systemic issue, tackling urban heat islands "requires significant local powers in terms of planning and design" (ibid.: 83). This reinforces the Urban Task Force's (1999) recommendations that called for an integrated approach to planning, urban design and management with a view to enhance the potential amenity value of public realm. Multi-functional green networks or 'green infrastructure' can provide cooler microclimates, reduce surface water runoffs and help urban areas better adapt to climate change. Protecting local amenities, notably green areas, has been an integral part of the planning system. However, the rationale for it has changed over time (see Davoudi 2012). Today, the need to adapt to climate change has renewed the functional rationale for protection of green spaces. It has also extended their functional values from aesthetic to biodiversity and ecosystem. The green infrastructure resources need to be strategically planned, at both regional and local planning levels, and designed and managed to maximise their climate-related functionality (Gill et al. 2009). Planning's proactive and regulatory interventions provide critical means for achieving this.

Overall, the role of spatial planning in adapting to climate change is still at the developmental stage. Some even argue that it is taking place "on the fringes of the spatial planning system" (Bulkeley 2009: 293). Institutionally, this is because the growing stakeholder-based Climate Change Partnerships that were set up across the UK to pursue local adaptation strategies were operating largely outside the formal arenas of the planning system. However, the situation is dynamic, and a whole host of new climate protection policies (such as surface water management plans) are on the horizon, whereby the planning system has been earmarked to deliver.

6 Concluding Remarks

Responding to climate change is a challenge not just for the planning system, but also across the policy sectors and for the government as a whole. There has been a proliferation of governmental reports, national planning policy statements, emerging legislation at both national and international levels, as well as academic literature, which demonstrate a widespread recognition of the pivotal role of spatial planning not just as a technical means by which climate change policies can be delivered, but also as a democratic arena through which negotiations over seemingly conflicting goals can take place, diverse voices can be heard and place-based synergies can be aimed for.

Much has already been delivered through all three types of planning interventions. However, there are limits to how much planning can do. Its effectiveness clearly depends on the extent to which it works in harmony with other policy instruments, such as green taxation, other regulatory measures, education and awareness raising programmes, direct construction and/or subsidisation of development projects and promotion of behavioural change. Furthermore, planners are faced with a number of challenges which are arising from the inherent complexity of dealing with climate change issues, such as: the interaction between energy, transport and settlement pattern and between energy and building performance; transition from the current state of the built environment to one which is less dependent on fossil fuel; timescale and dynamics of change (e.g. extended, sometimes millennial, timescale of climate change and the traditional planning timescale of 10–20 years); interactions of various spatial scales (e.g. mitigation of GHG emissions has aggregate effects at a global level, but derives from cumulative actions at smaller spatial scales); evolving policy context and the need for adaptive management; and, potential conflicts between adaptation and mitigation measures. These complexities coupled with climate change uncertainties require a portfolio of governance responses of which planning is only one area.

A further point worth mentioning is that most of the progress so far has been made in a long period of unprecedented economic growth fuelled by an incredibly buoyant property and, particularly, housing market. This period has now come to a halt. Thus, the critical question is how the economic downturn will affect the balance of priorities in spatial planning decisions. If history is anything to go by,

the answer may not be promising. That is why professional planners are increasingly concerned that sustainability goals may be perceived as "luxurious embellishments to developments" (Hartley 2009: 16). In 2011, the neo-liberal reform of the planning system began to swing the pendulum sharply towards the relaxation of planning regulations in the name of economic growth, at the time when the urgency of actions on climate change should be the key priority. If this priority is acknowledged, then attempts should be made to capitalise on planning's proactive and regulatory interventions and its strategic coordination capacity at the local level by taking actions at the national level and on a number of fronts, including:

- policy prioritisation in favour of environmental sustainability and climate protection instead of an overriding presumption in favour of development;
- better institutional coordination between and within central government departments on critical climate change issues;
- enhancement of the quality and quantity of skilled human resources through, for example, making climate change a core subject in planning education and;
- allocating more resources to planning authorities (commensurate with their growing responsibilities) to enable them to deliver national policy goals and offer innovate local responses to climate change challenges.

The latter is particularly important in the context of adaptation responses because they need to be tailored-made and fine-tuned to suit the specific socio-economic and geophysical circumstances of localities. Hence, the local and regional planning bodies with their local knowledge are in a better position to deliver them.

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