

A low-carbon future: Spatial planning's role in enhancing technological innovation in the built environment[☆]

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ABSTRACT

The scope of spatial planning activity includes issues of governance, corporate organisation, policy integration, statutory and regulatory frameworks, and technical analysis and design. The nature of its potential contribution to achieving low-carbon built environments will vary according to the resolution of tensions between pressures for leadership, consistent decision making and speed of change and the value placed on diversity, flexibility and innovation.

A planning system that can support technological innovation will be characterised by high levels of organisational and institutional capacity and high-quality knowledge systems that support a focus on delivering place-based objectives. The paper reflects on further aspects of such a system and the issues that spatial planning needs to address in delivering low-carbon energy systems.

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1. Introduction

The capacity and preparedness of the UK's planning systems to accommodate and promote new technologies, and resulting new urban forms, may be critical to the achievement of a low-carbon future. At one extreme they have the ability to slow or stifle innovation, while at the other they may stimulate new lines of research and development, and new corporate and community endeavours in shaping the built environment. The nature and future, of planning systems, including all the policies and procedures through which societies coordinate the use and development of land with wider development objectives, inherently reflect political, economic and social circumstances.

As society engages with pressures of change, the character and detail of the planning system respond. The way in which it responds will have major implications for the outcomes that it achieves. UK planning systems have maintained a marked degree of continuity over the last 60 years around key aspects including democratic involvement in plan making, development decisions and appeals. These principles are constantly contested, not least by the ongoing flow of 'reforms' that they are currently facing.

It is possible that the key drivers which have shaped planning activity in the UK since the Second World War are about to be replaced by a focus on carbon substitution (Fig. 1). But the

evidence that this will happen is far from certain. While climate change and carbon reduction commitments have begun to shape planning objectives, and can be expected to do so over the next 20 years, planning policy is also under huge pressure to facilitate large-scale housing and infrastructure development more rapidly than ever. Similarly, there are stark choices to be made in choosing the preferred low-carbon scenarios towards which we want to move, and therefore the character of the planning system that would most effectively achieve it. For example, the planning system that most efficiently delivers large-scale infrastructure solutions based on nuclear power is likely to be different from the system that most effectively delivers diverse, decentralised local infrastructures.

Planning systems do not drive values and priorities, but they do bring together key mechanisms for implementing them. The future of planning in the UK will depend on what our society embraces as the major drivers for its development. In this context, our planning systems are ever-active arenas of political and institutional debate (Cowell and Owens, 2006). This paper describes core tensions in UK spatial planning. Their resolution will have critical implications for how it will support technological innovation.

2. The scope of spatial planning

The concept of spatial planning has been a central part of planning reform debate over the past decade. It is embraced in national planning policy statements and guidance as marking a move away from a regulatory focus towards the proactive

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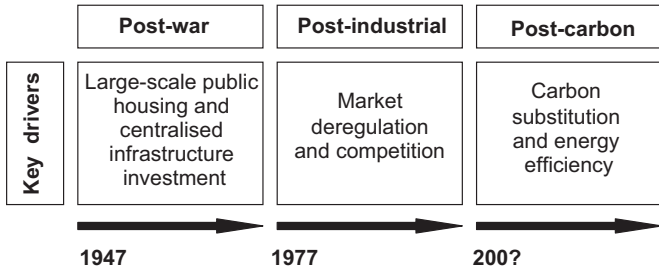


Fig. 1.

Box 1—National planning policy for climate change mitigation in the UK

Planning and Climate Change—Supplement to Planning Policy Statement 1 (CLG, 2007a)

PPS 22 Planning for Renewable Energy (ODPM, 2004) and its companion guide
Wales Spatial Plan (WAG, 2008)
Planning Policy Wales (WAG, 2002)
Ministerial Interim Planning Policy Statement for Renewable Energy, and related technical advice note (WAG, 2005a, b)
National Planning Framework for Scotland (Scottish Executive, 2004)
SPP6 Renewable Energy and PAN 45 on Renewable Energy Technologies (Scottish Executive, 2002, 2007).

The Scottish Government has also consulted on draft guidance ‘Statutory Guidance on Planning and Sustainable Development’ in March–June 2007, which aims to advise on ways in which planning can address climate change.

coordination of public- and private-sector investment and sectoral integration. It has also been closely associated with community engagement agendas. But it remains a contested concept. In practice, spatial planning interacts with governance and development processes in hugely complex ways. Its two main statutory levers are forward policy and programme making through spatial development plans and related policy documents, at regional, subregional and local levels, and the control and shaping of development proposals through the planning permissions and appeals systems.

The balance between the rights of property and of public goods lies at the heart of planning legislation, which allows development decisions to be expedited outside the courts and through processes which are designed to be democratically accountable. The nature and degree of democratic accountability allowed for is also a highly contested subject, as has been vividly demonstrated by recent debates on proposed planning legislation (Journal of Planning and Environmental Law, 2008; Lock, 2008).

Box 1 highlights the emerging national-level policy framework shaping planning practice for low-carbon development. At all government levels, UK planning systems have the stated purpose of supporting sustainable development as set out in the UK Sustainable Development Strategy (HM Government, 2005), which identifies climate change as one of its four priorities. Common themes of national policy for carbon management are:

- the setting of targets for carbon emissions,
- the setting of targets for renewable energy production,

- the setting of standards for buildings performance for energy efficiency,
- patterns of urban development that support sustainable transport including public transport, cycling and walking, and the reduction of car use and sustainable energy infrastructure.

Regional planning bodies are adopting climate change policies that include promoting greater resource efficiency in buildings and urban systems, reducing travel needs, promoting land use that acts as a carbon sink (e.g. forestry), encouraging the development and use of renewable energy and reducing waste. Together with the National Planning Framework for Scotland and the Wales Spatial Plan, these set the parameters for local policy development and implementation. The setting of targets at national, regional and local levels is based on the expectation that regional and local development can be planned to deliver required carbon trajectories for regional and local areas. However, resources for collating, developing and handling data are insufficiently developed to allow proposals to be promoted, modified or rejected on the grounds of their carbon impact.

3. The future of spatial planning

Given the scope of spatial planning, and the rapidly emerging policy framework in which it exists, its impact on levels of technical innovation in the built environment could be expected to be high. Climate change policy, along with other drivers, may in fact push UK planning systems in either of two clearly opposed directions (Fig. 2). On the one hand, the scale and rapidity of change required to deliver a low-carbon built environment suggest the need for strong central leadership, with a top-down hierarchy of policies and regulatory requirements for spatial planning. This could be expected to set standards for carbon technologies at the best available levels, tightly enforced through a combination of planning control and other forms of environmental regulation, such as building control. New large-scale domestic markets would develop to deliver the technical standards of low-carbon management in all aspects of the built environment. The planning system would place enhanced emphasis on technical analysis and decision support systems. Monitoring systems would be streamlined and standardised at a national level. The system would become less discretionary and give more certainty to prospective developers delivering standardised products. It would therefore be likely to favour developers who could develop economies of scale in a tightly regulated market.

Under this system, the introduction of innovative technologies would be constrained by the lack of opportunity to pilot new systems unless they were able to conform to all aspects of the regulatory requirements, and either coordinate or compete with the dominant infrastructures favoured by national government. However, it would be possible for strong central leadership to give

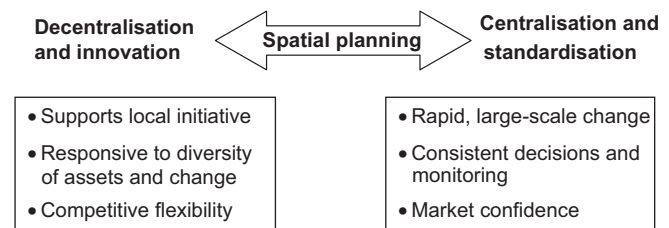


Fig. 2.

impetus to chosen social innovations. For example, different forms of local combined heat and power (CHP) could be supported by favourable tax regimes. However, a centralised regulatory policy may lack the flexibility required to support such innovation.

This system could permit enhanced development based on the installation or development of standard products, which would shift the regulatory burden from the planning system to other environmental regulatory systems, particularly the licensing and permitting systems operated by the Environment Agency, Scottish Environment Protection Agency and the Environment and Heritage Service in Northern Ireland. Local authorities would become less central in planning decisions, which would therefore become less politically accountable. This may have implications for human rights with respect to development decision making. Currently, the argument against third-party appeals against planning decisions in the UK is based on the representative capacity of local authorities in the decision-making system (Ellis, 2000). If this is further eroded by a centralised development planning system, there could be renewed pressure to institute third-party appeals procedures for development. Citizen engagement and trust in a more centralised planning system would be a major issue.

On the other hand, an emphasis on a decentralised and innovation-friendly response to the challenge of delivering a low-carbon built environment would be likely to increase the role of local authorities and other elected bodies, such as parish councils, in planning decision making. This places increased emphasis on such authorities to develop forward planning frameworks (local development frameworks, local plans or their equivalents) that can demonstrate acceptable low-carbon objectives that are compatible with a locally shared vision for how the area will develop. Such frameworks could allow informed discretion in response to individual proposals for innovative construction and infrastructure. Decisions would be taken on the basis of local understanding of the capacity of an area. Issues taken into consideration might include risk, for example to irreplaceable assets such as built heritage, social cohesion, diversity and relationships with neighbouring areas.

However, such a creative response is only possible where there is a permissive approach on the part of national government in terms of local objectives, priorities and regulations. The challenge for national leadership to achieve overall targets and ensure minimum standards would require new approaches to coordination and governance. A major aspect would be the development of communications tools, including interactive analytical and monitoring systems, that can be easily accessed by all stakeholders including individual citizens and community groups. This would require further major investment in systems such as the Planning Portal. The role of the Web as a coordinating and communications tool in a decentralised planning system is likely to be central. It would be important to empower enhanced citizen use of the Web and ensure its general availability (see for example RTPI, 2007).

The capacity of UK planning systems to deliver the changes to the built environment that are required for a low-carbon future will depend on the Government's determination to resolve the tensions identified above. It should be possible, for instance, to combine strong national-level leadership with sufficient flexibility at local and regional levels to support innovation and learning. On the one hand, the setting of standards and coordinated monitoring is a valid role for central government, while on the other, responsive, non-bureaucratic decision making should be facilitated at appropriate levels. The provisions for the Climate Change Committee set out in the Climate Change Bill should support this approach. A recurring theme will be the functional area within which decisions need to be made to achieve the necessary balance.

4. Supporting innovation

In resolving these tensions, relevant criteria for assessing the capacity of planning systems to support successful innovation will be

- organisational and institutional capacity,
- the quality of knowledge bases and learning networks,
- responsiveness to creative design and construction practice,
- a focus on development outcomes and problem-solving as opposed to predetermined processes and outputs,
- proportionate regulation.

4.1. Organisational and institutional capacity

New forms of low-carbon development will require close cooperation between planners, regulators, development agencies and, of course, developers (Lyell Hoppe, 2007). The role of local authority planning services must be to keep raising the bar to improve performance and to tailor it to local circumstances and opportunities. Appropriate technologies and their potential will vary in different places. Importantly, the consultation on the Planning Policy Statement on climate change stated: 'Judgements as to how new development should integrate with local potential, and the local vision for securing and delivering this potential, are best made locally and through the preparation of the Local Development Framework as part of the wider consideration of the infrastructure and services needed to secure sustainable communities' (CLG, 2006, p. 19). A powerful precedent exists in the form of the 'Merton Rule', which requires the provision of on-site renewable energy production in non-residential developments (see LGA, 2007).

Planning gain will be one important tool used to deliver low-carbon development. The potential for linkages to planning-related charges, such as the proposed Community Infrastructure Levy, is a critical issue. The coordinated development of infrastructure such as CHP may be realised through public funding mechanisms, such as Local Area and Multi-Area Agreements, based on requirements identified through local development plans or frameworks.

4.2. Developing knowledge bases and networks

Morphet et al. (2007) stress that the engagement of stakeholders, including the public and politicians at regional and local levels, is critical to effective spatial planning by local authorities. It is vital that local authorities, working closely with other agencies, develop the spatial visions of the future which they will be instrumental in delivering. Engagement is also a key lever for behavioural change in organisations. Morphet et al. describe successful working relationships between spatial planners and public transport providers in supporting development intensification and new development corridors. In this context, the use of common evidence bases was found to be an important component of joint working. Such evidence bases have been successfully used for transport projects, environmental assessment and housing needs assessments. However, they are not generally well developed. Kellett (2007) stresses the significance of localised baseline studies in enabling the most effective and responsive strategies for carbon reduction to be identified. The availability of emissions data and the reliability of performance data will be critical issues for planners.

Rydin et al. (2006) explore specific barriers to disseminating knowledge necessary to respond to innovation in sustainable construction. In particular, they note 'the dearth of knowledge

brokers that is inhibiting learning' (p. 29). Future proofing will depend on improved knowledge management within the widely constituted communities of practice that are needed to deliver low-carbon energy systems. This raises issues of supporting the development of knowledge bases and their use by policy makers, developers, decision makers and regulators, and the role of knowledge networks in such development. Universities, research councils and professional institutes will play a leading role in delivering the knowledge capacity required. Web-based and work-based knowledge development and management practices should both be increasingly exploited.

4.3. Creative design and development practice

The preparation of local forward plans provides an important arena for innovation and creativity. The early stages of plan preparation and sustainability appraisal, or of strategic environmental assessment processes, are vital to scoping and identifying opportunities. As stressed by Tidd et al. (2005), 'innovation is driven by the ability to see connections, to spot opportunities and to take advantage of them'. Spatial planning processes offer a unique arena within which stakeholders in a locality can identify such opportunities. Early dialogue between developers, designers and development planners will be a vital part of development practice for low-carbon energy systems. Guidance prepared by Urbed and TCPA for Sustainability West Midlands highlights examples of emerging good practice (Dodd et al., 2007).

4.4. Outcomes focus

As we discussed above, there is a danger that policy for low-carbon built environments will result in preoccupation with targets, highly centralised infrastructure, mass-produced technical solutions and bureaucratic assessment of individual development applications. To address this challenge within the development planning cycle, planners need to be able to ask:

- How can we use visualisation, visioning and engagement techniques to inform options, appraisal and decision making that will often need to challenge expectations and the 'comfort zones' of investors, house-buyers, community groups and decision makers?
- What are the opportunities for low-carbon energy systems in this place and at this scale? How can we use the planning system to identify and apply them? Do we have the information we need at the necessary levels?
- What are the resulting area-wide infrastructure requirements? Are there potential renewable and low-carbon energy networks that require strategic development and investment?
- Are there implications for changes in settlement patterns? For instance, are there opportunities to seek overall carbon reduction through new urban forms?
- Are there areas with greater capacity for different types of change? What procedures should be used to assess them? What are the opportunities for zero-carbon developments, at both micro- and macro-scale?
- What will low-carbon energy systems look like in this place, at this scale? Are there opportunities for pilot developments?
- What are the opportunities for specifying microgeneration across all forms of development?
- How do proposals contribute to diversification and security of supply at different scales?
- What are the critical design issues? Can these be addressed through supplementary planning documents? What minimum design requirements are required for implementation?

In this context, key challenges and opportunities for policy makers will include understanding how the development of new, decentralised energy infrastructure can be integrated with both development and redevelopment schemes. Another major area that needs further work is the integration of energy production with other resource management policies, including energy-efficiency initiatives.

4.5. Proportionate regulation

Development managers working in an outcomes-focused decision-making framework base their decisions on a proportionate assessment of the impact of a proposal, using key criteria. In most instances their decisions are arrived at after balancing several distinct development objectives that in many instances conflict with each other. Such decisions need to be managed through an evolving and evidence-based debate about priorities. An important consideration is to identify what actually requires planning permission. *Changes to Permitted Development: Permitted Development Rights for Householder Microgeneration (CLG, 2007b)* uses an 'impact-based approach' to set out what domestic microgeneration will be regarded as permitted development. A similar review has been undertaken for non-domestic technologies. Such reviews are intended to reduce barriers to the development of innovatory technologies. However, they are inherently limited by the rigid legal basis of the General Permitted Development Order (the GPDO), the Statutory Instrument that defines exactly what developments should not require consent. Making changes to this Instrument, which now numbers 40 separate parts in England (22 in Scotland), is a cumbersome exercise in which precise legal drafting is at a premium. Delays in securing initial changes to accommodate domestic microgeneration were a source of great frustration to UK renewable energy providers and were seen as a significant barrier to the industry's growth.

Changes to the GPDO tend to remain in force for long periods. This means that development will only be permitted if it matches the specifications of the enacted Statutory Instrument. New low-carbon technologies that have a relatively low impact but do not comply with the stipulated limits—green roofs perhaps—will therefore face a period of uncertainty as to their planning status. Further difficulties over permitted development arise from the need for stipulated performance levels, for example, to ensure minimum noise and vibration levels. The renewable energy industry proposes that only equipment installed by registered manufacturers should be permitted. Such demands do not sit easily within the GPDO. It sets solely physical limits to development, although certification is provided for some telecommunications equipment. Certification may be needed increasingly for new technologies that are not familiar to local authorities.

5. Key principles for the role of spatial planning in delivering a low-carbon future

The key principles affecting the ways in which spatial planning will be able to support innovation and the testing and acceptance of new or unfamiliar technologies will depend on the following.

5.1. Leadership

There needs to be a clear statement of national policy objectives in terms of low-carbon development which informs and validates all local planning objectives, and which is capable of withstanding scrutiny upon challenge by developers. Locally

specific policy making needs the support of a well-informed and responsive national planning inspectorate. The Climate Change Committee could play an important role in advising the inspectorates in England, Wales, Scotland and Northern Ireland on the soundness of plan strategies and policies.

5.2. Recognition of the role of the development plan

Morphet et al. (2007) set spatial planning policy firmly within its wider policy context. Development plans are the locational expression of area-based visions for development. A key function of these frameworks is resource allocation and investment at the local level. In this context, the potential for spatial planners to drive forward and coordinate critical aspects of the delivery of low-carbon energy systems has still to be fully realised. There needs to be a national requirement that development plans set ambitious but achievable targets for low-carbon energy production and use.

5.3. Investment in knowledge

Planners need the support of strong, locally specific databases on which they can base the development of clear policies. Developing alternative visions for what low-carbon cities will look like requires the support of an enhanced research programme and significant investment in measurement, monitoring and information sharing. This should be linked to the development of interactive communities of research and practice around the knowledge needed for low-carbon development.

5.4. Place-based solutions

Maximising stakeholder and public inclusion, learning and entrepreneurship as the basis of community-wide change will ensure long-term innovation and delivery. Planners should be encouraged to bring together energy and housing providers and developers to develop creative place-specific solutions, in close working relationships with community groups and local representatives. There may be a potential for a form of 'Challenge' programme which encourages a creative, competitive approach to what can be achieved.

5.5. The importance of delivery vehicles

In introducing the overview, monitoring and advisory role of a new Climate Change Committee, the Climate Change Bill highlights the fact that carbon reductions will be met through a very wide range of delivery vehicles. Such mechanisms must be based on local or otherwise appropriate development policy, and should be linked to funding arrangements such as local and multi-area agreements. The Callcutt Review's proposal (Callcutt, 2007) for a national exemplars programme for zero-carbon housing might be one such delivery vehicle, with a clear planning framework that could be adopted easily by the current system.

5.6. Streamlining and integration of regulation

Planning permission needs to be clearly linked with environmental standards, certification and enforcement (e.g. building control standards and product certification). Ensuring that levels of control are proportionate and appropriate will involve clearly expressed permitted development for low-impact technologies.

In this context, the most important incentive for proactive planning will be the commitment of government to putting a spatial planning approach at the heart of its broader policy obligations and objectives. This is partly a question of leadership, but will also be hugely influenced by the relationship between national and subnational levels of government.

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