All Party Urban Development Group
promoting sustainable development and urban renewal

Greening UK cities' buildings

Improving the energy efficiency of our offices, shops and factories

A report delivered by the officers
Clive Betts MP
Lord Richard Best
Rt Hon Nick Raynsford MP
Baroness Scott of Needham Market
Robert Syms MP

On behalf of the All Party Urban Development Group
www.allparty-urbandevelopment.org.uk

About the All Party Parliamentary Urban Development Group

The All Party Parliamentary Urban Development Group (APUDG) is a cross party Parliamentary body of MPs and Peers committed to progressing urban renewal and sustainable development in the UK.

The group was formed to raise the profile and understanding within Parliament of the urban regeneration process and the role that can be played by the private sector, particularly the property investment community. The group's remit is to take a holistic approach in the examination of all the constituent elements that bring about truly sustainable communities, and to review policies that will increase the quality and pace of urban renewal and sustainable development nationally.

About this report

This report looks at what needs to be done by both the public and private sectors to reduce the energy use of cities' existing non-domestic buildings. It focuses on three key barriers: the availability of information; the economics of retrofitting (including the owner/occupier responsibility dilemma); and physical barriers such as the age and location of buildings. In particular, it emphasises how better measurement, greater awareness and systematic management can help owners and occupiers to realise 'quick wins' at almost no additional cost.

The report draws on a range of evidence, including:

- A formal inquiry session, held in the House of Commons on 12 May 2008. A full transcript of the session, including testimony from a range of public and private sector witnesses, can be found on the APUDG website: www.allparty-urbandevelopment.org.uk.

- Written submissions to the APUDG from a range of key stakeholders. These were received from 22 groups, including experts, a range of private sector stakeholders (developers, investors, property consultants, facility managers, architects, tenants, among others), regional agencies, cities and other public agencies. A full copy can be downloaded from the APUDG website: www.allparty-urbandevelopment.org.uk.

- Desk-based research, conducted on behalf of the APUDG by Paula Lucci at the Centre for Cities.

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Acknowledgements

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Further information

Any queries can be directed to the Clerk of the All Party Urban Development Group, Kurt Mueller, at 0207 802 0128 or kmueller@bpf.org.uk.

Executive Summary

As climate change and energy efficiency move up the political agenda, Britain needs to focus its attention on reducing the carbon footprint of its existing building stock. We urgently need to green Britain's offices, shops, and factories – which currently contribute nearly a fifth of the country's CO_2 emissions – if the government's 60% carbon reduction target is to be achieved.

This All-Party Urban Development Group report finds that there are significant barriers to greening Britain's existing buildings. These include:

- the availability of information;
- the economics of retrofitting (including the owner/occupier responsibility dilemma); and
- physical barriers, such as the age and location of buildings.

The report goes on to make policy recommendations to central government, local authorities and the private sector who jointly need to set out a clear plan for tackling energy use and emissions in existing buildings.

Critically, the report finds that better measurement, greater awareness and systematic management can help owners and occupiers to realise 'quick wins' at almost no additional cost.

The officers of the APUDG, together with the secretariat, have identified the following policy recommendations:

Raising awareness

Recommendation 1: better coordination of government agencies

Although government has made progress in raising awareness on energy efficiency, too many departments have a stake in this agenda, often creating confusion among private sector stakeholders. Having one single voice on energy efficiency would allow for more effective dissemination and uptake of energy efficiency measures.

A single central government unit could act as a 'one stop shop'. This unit would be responsible for the delivery of a coherent approach to energy efficiency, bringing together all government actors involved and streamlining the different schemes and policy options that are currently available through a variety of agencies.

Recommendation 2: clear advice for owners and occupiers on how to make easy savings

Local government has a key role to play in facilitating engagement and sharing best practice between major property owners and occupiers. This would help them achieve reductions in energy use and make easy savings (for example, through a better use of buildings' equipment). In addition, successful local level experiences, like the London Better Buildings Partnership, should be shared more widely across other cities and regions.

The private sector itself can also do more to co-ordinate owners and occupiers, for example through the introduction of green leases.

Recommendation 3: lead by example, a green government estate

Central and local government should lead by example – by implementing the efficiency measures required of business and households. Government should also use its procurement role to influence the property market. A green government estate would provide important market signals – and a clear demonstration of commitment.

Regulation

Recommendation 4: establish a single measurement framework for non-domestic buildings

In order to increase energy efficiency, it is crucial to have a standard measurement system, and a set of comparable benchmarks for non-domestic buildings in Britain. Additionally, a national building performance database would allow for transparent performance tracking contrasting a building's actual performance with initial design assumptions.

Recommendation 5: extend DECs to privately-owned commercial buildings

Display Energy Certificates (DECs) measure the actual operational use of energy – but are currently only required for large public buildings. These should be rolled out to cover all non-domestic buildings in the medium term, allowing investors and occupiers to factor in the energy performance of their buildings. In the short term, government and the property industry could encourage the voluntary adoption of these certificates, as some are already doing.

Executive Summary cont.

Recommendation 6: raise energy efficiency standards using building regulations

A requirement to display information on a building's energy performance is a prerequisite, but will not necessarily drive behavioural change on its own. Changes in building regulations – including the progressive ratcheting-up of energy efficiency requirements, or the introduction of new trigger points for retrofitting – could encourage progressive improvements in energy efficiency.

Recommendation 7: ensure effective enforcement of regulation

It is important that mechanisms are put in place to ensure enforcement. Clear guidance needs to be provided for those required to issue and hold energy performance information, and for local trading standards officers – who are responsible for enforcement. Improved policing of building regulations is also required – so that owners begin to expect post-occupation inspections of their properties.

Fiscal incentives

Recommendation 8: examine the fiscal consequences and effectiveness of incentives/grants related to improvements in energy efficiency

Once 'quick win' measures are put in place (e.g. switching equipment and lights off), there is scope to consider in the medium to long term a range of fiscal incentives/grants to retrofit buildings and help owners deal with upfront costs.

The fiscal consequences and implementation difficulties surrounding the use of existing tax mechanisms (e.g. reduction in VAT for refurbishments; stamp duty; business rates; Enhanced Capital Allowances) need to be carefully studied. A closer examination of energy price elasticities, in both the non-domestic and residential sectors, would also help with the design of fiscal incentives. Finally, the differential impact on small and medium sized businesses also needs to be taken into account.

Introduction

There is no doubt about the urgency of responding to the threat of climate change[1]. The Stern Review provided a compelling argument about the economic costs and risks of inaction.

Cities are critical to tackling climate change. They contribute directly to the UK's carbon footprint through emissions generated by consumption of energy within buildings and facilities, transportation of people and goods, street lighting and waste management.

Buildings alone generate almost half of all CO_2 emissions in the UK – 27% from the 26 million residential dwellings, and 17% from the 2 million non-domestic buildings.

Debate to date has mostly focused on the residential sector. Less attention has been paid to efficiency initiatives within the non-domestic sector, which includes large buildings with high levels of energy consumption, and involves big players within the corporate and property world. This report will help to fill this gap by exploring how cities can work with owners and occupiers to reduce the carbon footprint of Britain's existing buildings starting with our offices, factories and shops.

In addition, the International Energy Agency and the UN Intergovernmental Panel on Climate Change (IPCC) have identified the buildings sector as the segment of the market with the largest potential for energy efficiency gains. Thus, reducing the carbon footprint of the built environment is one of the crucial policy measures needed to tackle climate change. Central government, city leaders, the voluntary sector and business all have a key role to play.

As stated in Budget 2008, the government is now considering policy options to address carbon emissions from non-domestic buildings, with the overall objective of

- making new buildings carbon neutral by 2019, and
- improving the energy efficiency of and reducing carbon emissions from the existing stock.

While reducing carbon emissions from new stock is necessary, only 1 to 2% of commercial building stock is replaced each year, which means that by 2050 around 70% of the current stock will still be in place (UK Green Building Council 2007).

1 See Intergovernmental Panel on Climate Change (2007).

Introduction cont.

For policy to have a real impact, actions aimed at increasing the energy efficiency of existing stock must be considered.

This report, based on the oral and written evidence provided by a range of private and public sector stakeholders, examines the barriers to greening existing non-domestic buildings, and sets out key policy recommendations to break down these barriers. It is structured as follows:

- Section 1 sets out key facts and figures on the environmental impact of cities' non-domestic buildings;
- Section 2 takes a closer look at how improving the energy efficiency of existing buildings impacts more widely on city economies;
- Section 3 examines three key barriers to greening the existing non-domestic building stock – the availability of information; the economics of retrofitting (including the owner/occupier responsibility dilemma); and physical barriers such as the age and location of buildings; and
- Section 4 sets out the APUDG's conclusions and recommendations to central government, local councils and private sector stakeholders.

Section 1
UK cities' buildings: key facts and figures

Cities are key to tackling climate change. In the UK, cities represent 44% of total emissions – of which almost 30% come from the English core cities and London alone. Naturally, a large proportion of dwellings and non-domestic buildings are concentrated in cities[2].

Energy consumption (electricity and gas) is often the major contributor to non-domestic buildings' carbon emissions. Although it varies by sectors, heating and air conditioning, followed by lighting, are responsible for the highest proportions of energy use (McAllister 2007; Levine, Ürge-Vorsatz et al 2007).

Sectoral breakdowns show factories and retail as the largest contributors to carbon emissions within the non-domestic sector (BRE 2006). If data on carbon intensity is considered (measured as emissions per m^2 of floor space per year), then the transport and communications, hospitality and retail sectors appear among the most intense users of energy (BRE 2006).

Major studies have identified the property sector as one in which carbon reduction is most cost effective. According to the UN Intergovernmental Panel on Climate Change (IPCC), around a third of projected baseline emissions by 2020 can be avoided through cost effective mitigation measures in the residential and commercial sectors (Levine, Ürge-Vorsatz et al 2007). In addition, the International Energy Agency with the OECD and the UN Commission on Sustainable Development concluded that nearly half the potential reduction in CO_2 emissions achievable in the short term could come from more efficiency rather than from changing production (King Sturge 2008/2009).

While it is not possible to draw general conclusions on individual measures and end-uses, efficient lighting technologies and improved insulation, district heating and space conditioning appear among promising measures in terms of cost effectiveness (Levine, Ürge-Vorsatz et al 2007).

A UK study (BRE 2006) also finds that improved lighting, and more efficient heating and air conditioning systems are highly cost effective measures to achieve a reduction in energy use. In fact, BRE estimates indicate that technology is available to reduce 36% of existing emissions, of which 19% could be reduced cost effectively.

2 Calculations on cities' total emissions include all UK urban areas and use data by local authority sourced from DEFRA (2005). Approximately 60% of total commercial and industrial premises are concentrated in urban areas. Calculations based on CLG (2007) Commercial and Industrial Floorspace and Rateable Value Statistics (2005 Revaluation).

Box 1: Defining energy efficiency and the environmental impact of buildings

The All Party Group's inquiry focuses on a specific aspect of buildings' environmental impact: the carbon produced as a result of the energy directly used by buildings. The environmental impact of buildings, however, is a wider concept that goes beyond energy use, carbon footprints and climate change mitigation. It covers broader issues such as: use of materials, embodied energy/carbon, water use and handling, waste, transport (related to the means of transport used by buildings' occupiers and suppliers and location of the building), and climate change adaptation[3].

The focus of this report is on the policy options that can drive behavioural change, such as raising awareness, regulation and fiscal incentives, rather than on the different technical solutions[4].

Box 2: The Energy Performance of Buildings Directive (EPBD)

The Energy Performance of Buildings Directive – part of European legislation that all member states must adopt - was introduced in Parliament in March 2007. Measures set out by the Directive include the following:

- introducing energy performance certificates (EPCs);
- requiring public buildings to display energy certificates (DECs); and
- requiring inspections for air conditioning systems.

The Directive will come into force in different phases as described in Table 1. By October 2008 all buildings - homes, commercial and public buildings - when sold, built or rented will need an Energy Performance Certificate (EPC). The certificate provides energy efficiency ratings on a scale from A to G and recommendations for improvement. The ratings are standard, so that energy efficiency can easily be compared across different buildings of similar type.

3 For more details, see Carbon Trust (2007).

4 Broadly speaking, different technical options include 'quick wins' (changes in behaviour such as switching lights and computers off); changes in equipment (more efficient lighting, heating, ventilation and air conditioning (HVAC) systems and boilers, management systems) and the building fabric (insulation, glazing); and, replacing traditional sources of energy with low-carbon technologies (for example, wind turbines, solar panels, and combined heating and power).

By October 2008 Display Energy Certificates (DECs) will also be required for larger public buildings, so that everyone can see how efficiently public buildings are using their energy. DECs report on buildings' actual energy use – rather than design specifications - and must be displayed in a prominent, clearly visible, place. They are accompanied by an Advisory Report, which sets out cost effective measures to improve the energy rating of a building. A DEC is valid for one year and the Advisory Report is valid for seven years[5].

It is widely known that there is a gap between buildings' energy performance by design (EPCs) and how they actually operate (DECs). Therefore, both EPCs and DECs are needed in order to have a holistic picture of a building's energy performance.

Table 1: Implementation of the Energy Performance of Buildings Directive (EPBD)

6 April 2008	EPCs required for construction for all dwellings. EPCs required for the construction, sale or rent of buildings other than dwellings with a floor area >10,000 m^2.
1 July 2008	EPCs required for the construction, sale or rent of buildings other than dwellings with a floor area >2,500 m^2.
1 October 2008	EPCs required on the sale or rent of all remaining dwellings. EPCs required on the construction, sale or rent of all remaining buildings other than dwellings. DECs required for all public buildings >1,000 m^2.
4 January 2009	Deadline for first inspection of all air-conditioning systems over 250kW.
4 January 2011	Deadline for first inspection of all remaining air-conditioning systems over 12kW. Systems first put in place on or after 1 July 2008 must have a first inspection within five years of being put into place.

5 For more details, see http://www.communities.gov.uk/planningandbuilding/theenvironment/energyperformance/overview/ (last accessed June 2008).

Section 2
Wider impacts on city economies

With increasing awareness of climate change, European energy performance regulation, and a difficult macro-economic context – in particular rising energy costs and a depressed property market – it is crucial to take a closer look at how greening existing non-domestic buildings could impact city economies.

As stated by the IPPC report (Levine, Ürge-Vorsatz et al 2007), this is an area where little is known. Typically, mitigation strategies do not include a quantified assessment of the positive and negative economic effects of greening buildings at either national or city level.

The costs of energy inefficiency

It is possible that a two tier property market could emerge over the coming years – with a premium paid for more energy efficient properties. This could have economic impacts on cities with both highly efficient and highly inefficient stock. While some developers and tenants are already starting to take a longer term view, offering and demanding top end sustainable buildings, others are still holding on to lower end less energy efficient properties. If demand for sustainable buildings is set to increase, there is a risk that those who take a short term view and do not factor in the future price of carbon could be holding property that may lose value in the future, with potential impacts for cities' workspace offer and the economy more widely (local government stakeholder, written evidence; Creamer 2008).

There are some signs that demand for sustainable buildings is already increasing. Some tenants – especially large blue chip businesses' headquarters – are already demanding sustainable buildings and incorporating environmental sustainability as part of their corporate social responsibility targets (Economist Intelligence Unit 2008). The Occupier Satisfaction Index revealed a change in the industry, with a 54% increase over a year in occupiers' perception that owners were paying more attention to sustainability (Kingsley Lipsey Morgan and IPD Occupiers 2008).

In future, green buildings may become more central to occupiers' cost concerns as rising energy prices and questions over energy security are likely to move this issue beyond just a corporate social responsibility consideration.

If these trends in demand were to continue in the medium to longer term there is a risk associated with inaction: property in our city centres and business parks could become obsolete. Furthermore, given the current mobility of capital and workers, businesses could decide to locate elsewhere where their sustainability and efficiency needs could be better satisfied.

"The built environment should be designed for change. Future energy costs, legislation, building and appliance labelling, together with carbon trading being applied to progressively smaller organisations, will be driving the desire for lower carbon buildings…The challenge is to ensure our built environment does not become likewise (sic) obsolete" (private sector stakeholder, written evidence).

There are also multiplier effects related to increasing savings on energy bills and energy security. The money that businesses currently spend on energy because of inefficient buildings could be used to other more productive ends. In fact, some small and medium sized enterprises (SMEs) are already feeling increasing pressure from higher energy costs, with potential negative effects for their businesses and cities' economies if measures to cut these costs are not put into place[6]. On a larger scale, more efficient buildings ease the pressure and demand on centralised energy sources and infrastructure – liberating some of these resources for other uses.

Furthermore, although the current slowdown in the property market has led to some pessimism about the future of the green agenda, some argue that greener buildings may be more resilient to unfavourable market conditions. Tenant retention appears to be higher in this sub-sector, and re-letting easier with positive consequences for property owners and wider city economies (GVA Grimley 2008).

Greening buildings: new opportunities for city economies

Greening buildings also presents new opportunities for our city economies.

Increasing demand for retrofitting buildings may encourage the development of energy efficiency products and services as well as new jobs. Research for RICS (Dixon et al 2007b) has highlighted how there is an increasing demand for property

6 Sunday Times, 15 June 2008 http://business.timesonline.co.uk/tol/business/industry_sectors/utilities/article4138498.ece

services related to sustainability issues (expert, written evidence). In addition, the EU has estimated that a 20% reduction in EU energy consumption by 2020 can potentially create up to 1 million new jobs (EC 2005), especially in semi-skilled labour in the buildings trades (expert, written evidence).

The market potential for energy efficiency services in Western Europe, in particular the emergence of companies offering energy services (ESCOs), was estimated to be 5-10 billion euros per year (Bertoldi and Starter, 2003 quoted in Levine, Ürge-Vorsatz et al 2007). The market for energy efficient lighting and appliances is also set to increase. According to a Merrill Lynch report[7], the market for power semiconductors is expected to grow by 9% per annum through 2010 thanks to the need to improve energy efficiency throughout the electricity supply chain.

Well designed, more sustainable buildings may also have an effect on productivity (CIBSE 1999; Levine, Ürge-Vorsatz et al 2007). Research finds that an increase of 1% in productivity can provide savings to a facility that exceeded its entire energy bill (Ogden 1996).

More research is required in order to understand the scale of these wider benefits, how they balance out environmental impacts, economic costs and physical possibilities of greening commercial buildings and, most importantly, how these vary from place to place. In the words of a local government stakeholder:

"The costs of retrofitting will vary across the different sectors as they have different accommodation requirements and different sunk costs in terms of plant machinery, etc. A clearer picture needs to be developed to understand costs within each sector as well as sector priorities in terms of the impacts they have on carbon emissions through their building fabric and the contribution they make to GVA [gross value added[8]]"
(local government stakeholder, written evidence).

7 Efiong, A (2007) Energy efficiency. The potential for selected business opportunities, The London Accord, London: Merrill Lynch http://www.london-accord.co.uk/accord_2007/contents.htm (last accessed June 2008).

8 Gross value added measures the total value of services and goods produced in the economy.

Section 3

Greening cities' non-domestic buildings: key barriers

This section brings together a range of evidence from the formal inquiry and written submissions to take a closer look at the key barriers to greening Britain's offices, factories and shops. The focus is on the availability of information; the economics of retrofitting (including the owner/occupier responsibility dilemma); and physical barriers including the age and location of buildings.

Availability of information

Measurement, benchmarks and transparency

A prerequisite for any effective government policy to improve the energy efficiency of existing stock is a consistent and transparent system of collecting and measuring actual energy use data. At the moment this is still not available in the UK, thereby preventing further policy development – *"if you can't measure it, you can't manage it"* (industry body witness).

Several stakeholders recommended that government establish a national building performance database, where energy bills could be logged (UK Green Building Council 2007). Actual performance could then be tracked against intended performance in a transparent way (expert, written evidence), also helping to avoid greenwashing[9].

At present, there is a proliferation of different measurement tools developed by the private sector to determine actual energy use (see Box 4). In the view of a private sector stakeholder:

"The government has a role to play in ensuring that tools developed for compliance with the EPBD are able to use data gathered by other tools and that the results of both EPCs and DECs are available widely in order to facilitate benchmarking and transparent comparisons" (written evidence)[10].

Other stakeholders, however, emphasised that the main difficulty relates to finding suitable benchmarks.

"With existing buildings, CO_2 emissions are associated principally with energy consumption, the billing information for which makes calculation easy. Try to discover the average energy consumption per m^2 of commercial

9 The Observer (2008) Developers accused of pursuing gadgetry instead of saving planet http://www.guardian.co.uk/environment/2008/may/31/greenbuilding.ethicalliving
Greenwashing refers to the dissemination of misleading information by organisations so that they appear to be environmentally friendly.

10 The EPC/DEC register will not be fully searchable. Instead EPCs can only be obtained from the building owner, and DECs available for viewing at the building or from the register with the specific DEC reference number.

floorspace, for example, and you will quickly discover that this is not straightforward. For any given building, therefore it becomes very difficult to know whether your CO_2 figures are 'good' or 'bad' ''
(private sector stakeholder, written evidence).

In the case of non-domestic buildings, benchmarking is a particularly difficult exercise given the variety of uses (from schools to supermarkets and commercial offices) and forms of buildings involved[11]. Benchmark data on typical performance and best practice energy use is required for a comprehensive range of building types taking into account buildings' specific characteristics. At present, the most widely used UK source of energy benchmarking is CIBSE (2004) Guide F Energy Efficiency in Buildings. This guide, however, does not include renewable energy systems and many have argued that benchmarks need to be updated to be more challenging (UK Green Building Council 2007).

Box 3: Contrasting non-domestic buildings with dwellings

Measuring and benchmarking the energy consumption of dwellings is much simpler than that of non-domestic buildings. There are no building services involved; occupancy patterns are similar from dwelling to dwelling; and homes come in broadly similar built forms. By contrast, non-domestic buildings come in all shapes and sizes; they have a range of building services, some of them are complex and require careful commissioning and management; and occupancy patterns are varied.

Therefore, benchmarking the energy performance of dwellings is much easier and so is achieving a unified code of best practice, such as the Code for Sustainable Homes (CLG 2007). By contrast, a calculation formula to determine occupant energy use based on floor areas is not possible in any generic way for non-domestic buildings. This needs to distinguish different categories of buildings (UK Green Building Council 2007).

11 For example, large retail buildings like department stores and supermarkets often combine deep plans (making day lighting and natural ventilation difficult to achieve) with very high lighting levels for display purposes.

In addition, although difficulties in coordination between owners and occupiers also apply to the residential sector, energy costs are a higher proportion of a household's total expenses. This provides occupiers with greater incentives to apply energy saving measures and liaise with owners to facilitate these (arguably, this also applies to the case of small and medium sized enterprises – this is explained in more detail in the next sub-section).

Other stakeholders raised issues related to the billing and metering information provided by energy suppliers. Multi-tenanted buildings, which are common in the non-domestic sector, pose particular challenges when it comes to measuring energy consumption. Different tenants often do not have access to sub-metering and therefore they do not have control over their energy consumption. In some places like Germany, it is commonplace in multi-tenanted buildings for each tenant to have his or her own meter of energy use, which gives them greater control over their own energy usage (industry body witness). In the view of one private sector stakeholder:

"Provisions for sub-metering are only implemented in newer buildings in compliance with the Building Regulations and its wider installation should be encouraged in existing buildings in order to facilitate the acquisition of relevant data" (private sector stakeholder, written evidence).

Box 4: Private sector initiatives

LES-TER

The Landlord's Energy Statement (LES) is a free tool that helps landlords understand the energy efficiency of communal services (heating, lighting ventilation outside of tenanted areas), compares the performance against similar buildings with similar uses, identifies any areas for improvement and illustrates where year on year improvements have been made.

The LES has been produced by the British Property Federation (BPF) with funding from the Carbon Trust, technical development by the Usable Buildings Trust and under the guidance and supervision of a group of BPF members - some of the largest property companies in the country.

The same group, with assistance from the British Council for Offices and the Chartered Institute of Building Services Engineers, has developed a partner tool, the Tenant's Energy Review (TER). This tool is designed to allow tenants to measure, monitor, and benchmark their energy use from direct supplies and the carbon dioxide emissions that it creates.

Put together, the LES and TER will allow tenants to calculate their energy use and carbon footprint for occupation of the building, and landlords should be able to assemble energy and carbon data on a whole building basis. Both the LES and TER recognise the split responsibilities of landlord and tenant, and the plurality of approaches to the provision of common services in rented buildings, addressing many of the issues mentioned later in this report concerning the owner/occupier responsibility dilemma.

IPD ENVIRONMENT CODE

The Environment Code is a standard for measuring the environmental performance of corporate buildings, developed by IPD and supported by a range of global firms and industry bodies.

It is a resource that sets a good practice global standard for the collection, measurement and analysis of environmental information (as it relates to non-domestic buildings). It enables property executives to compare the environmental performance of buildings anywhere in the world and benchmark against other peer organisations. It is applicable to a broad range of property types from retail shops and offices to hospitals, universities, hotels and airports.

Awareness of existing government programmes

Several stakeholders pointed to the fact that there is an overwhelming volume of information and often it is poorly tailored to suit particular needs. In a recent HM Treasury report[12], 70 national and 96 regional bodies were identified as delivering energy efficiency advice. To address this issue a local government stakeholder suggested that *"a much more tailored approach to service requirements needs to be developed and delivered at the local city wide level rather than the national one, albeit within a wider national framework co-ordinated by one single agency"* (local government stakeholder, written evidence).

Other private sector stakeholders also emphasised the lack of coherence of energy policy. *"A consistent message from all government departments would be very useful. Energy policy is fragmented and this needs to be addressed"* (professional body, written evidence).

People sometimes are unaware of the tools they have at their disposal. For example, *"there are a lot of people that are not aware of Enhanced Capital Allowances[13] and how to use them and how to capitalise on them, so the fact that they are there as an incentive does not mean there is any change in the market"* (private sector witness). Data gathered for a recent report commissioned by BERR on micro-generation technologies gives further support to this point (Element Energy 2008).

12 Report of the task group on business energy efficiency and advice, HM Treasury (2006).

13 The Enhanced Capital Allowances (ECA) scheme provides businesses with 100% first year tax relief on capital expenditure on energy-saving technologies (there is a specific list of equipment that qualifies for ECA). For more details see http://www.carbontrust.co.uk/energy/takingaction/eca.htm

Table 2: Awareness of energy efficiency support schemes

Policy	
Landlord's Energy Saving Allowance (LESA)	19%
Enhanced Capital Allowances (ECA)	22%
5% VAT on energy efficient purchases	57%
Grants from Low Carbon Buildings Programme	49%
Climate Change Levy exemption	46%

Source: Element Energy (2008)

The economics of retrofitting and the owner/occupier responsibility dilemma

Having better information about the actual energy consumption of buildings is a good starting point, but on its own is not sufficient to drive change. There are other major barriers that need to be broken down if the energy performance of the existing non-residential stock is to be improved.

The price of carbon

Although energy costs are certainly increasing – oil prices reached a peak of $142 a barrel in July 2008 from $65 in the previous year[14] – energy consumption only represents a small proportion of businesses' total expenses.

"Whilst energy prices in themselves are rising markedly, when you look at how much it costs to run a building energy costs are a small percentage of the overall costs, often in the realms of 1 to 2 per cent or sometimes even less, so rising energy costs in the short term in themselves are unlikely to be a sufficient driver" (private sector witness).

Therefore, corporate occupiers do not appear as yet to have sufficient economic incentives to take action to reduce their energy consumption, increase demand for greener buildings or consider paying a premium for buildings with better energy performance.

14 Financial Times (2008), Oil smashes to record above $139 a barrel http://www.ft.com/cms/s/0/9c732bb8-33c2-11dd-869b-0000779fd2ac.html (last accessed June 2008).

By the same token, without an increase in service charges or rents to recoup the upfront costs of retrofitting, investors and landlords do not seem to be ready to invest in upgrading their existing properties. This vicious circle is often referred to in the industry as the 'circle of blame'.

"Every institutional entity in the property sector is able to blame at least one other entity for failing to 'change' there is no demand, then there is no offer, and consequently there is no investment" (private sector witness).

In other words, the current business model does not provide any commercial incentives for different actors in the non-domestic sector to take actions to green Britain's existing building stock. This may start to shift with the enforcement of EPCs and DECs and may change in the non-distant future when the market starts to signal the real price of carbon[15].

To date it has often been corporate social responsibility and changes in consumer behaviour – often demanding products with green credentials – rather than energy costs that have provided incentives for businesses to reduce their energy consumption. So far corporate social responsibility as a sole driver has had mixed results: some corporate boards appear to have bought into the idea of the benefits of being perceived as socially responsible whilst capitalising on energy savings, but others often fall into the trap of greenwashing.

It is worth making a distinction between small and medium sized enterprises (SMEs) and big corporate players. Corporate social responsibility plays a much bigger role among highly visible, blue chip businesses than smaller enterprises. Bigger companies also benefit more from economies of scale which may make greening offices and factories easier.

Cost considerations may also hit SMEs much harder. On the one hand, energy bills often represent a higher proportion of their total expenses, leading smaller businesses to feel the rise of energy prices more profoundly than big corporates[16]. On the other hand, considerable resources are needed within organisations to identify both the government funding available

15 There is little knowledge of the energy price elasticities in both the non-domestic and residential sectors, which is essential for the design of policy (Levine, Ürge-Vorsatz et al 2007).

16 Sunday Times (2008) http://business.timesonline.co.uk/tol/business/industry_sectors/utilities/article4138498.ece

and upfront capital for retrofitting, and to match this to priority areas for investment in energy efficiency (private sector witness).

The costs of retrofitting

Retrofitting involves both direct costs (the upfront capital cost of working on the building fabric or replacing heating, ventilation and air conditioning (HVAC) equipment) and opportunity costs (the rent that landlords lose while work is being carried out in a vacant property). In the words of one private sector witness:

"We are having to pay out the capital, we are losing earnings while we are doing the upgrade, and in addition we are not able yet – and I hope this will change over time – to recoup the cost of the upgrade through larger rental or service value charges."

Naturally, retrofits in vacant properties are much easier to carry out since major improvements, for example to the heat retention capacity of the building, often result in some disruption during construction or installation. Therefore, it is easier to incorporate retrofitting to the buildings' natural cycle of refurbishment (McAllister 2007).

With only 2-3% of buildings becoming vacant per year, there are also some less disruptive alternatives that could be considered, such as secondary double glazing and roof insulation, which can be carried out while the property is occupied (McAllister 2007).

In addition, property investment horizons are becoming shorter – tenancy periods throughout the sector are shortening given occupiers' increasing need for flexibility. This poses difficulties when it comes to considering some low carbon technologies options which require much longer payback periods. In the view of a private sector stakeholder:

"Some low carbon technologies do not have a payback short enough to fit within most property investment horizons. Although grants and subsidies could help in the short term they should only be advocated if the property has been improved to minimise the load demand (sufficient levels of insulation coupled with adequate means of ventilation for example)"
(private sector, written evidence).

Other stakeholders referred to renewable zones or district level low carbon technologies as a more feasible option. In the words of one witness:

"It is very, very difficult and potentially unviable to put in renewable energy on a single site basis. We actively encourage the people we work with to put in renewable energy on a development wide or district wide service and we welcome that. We have got quite a number of sites, but we are being hidebound by a lot of councils who want 10, 20% of renewable energy on site and with one particular site, it is very, very difficult to achieve. That money would be better spent on energy efficiency measures"
(private sector witness).

Retrofitting also involves hidden costs. Buildings are complex systems, and understanding the best solution for a building's characteristics can become a difficult process.

"The economics of retrofit are, bluntly, profoundly hostile. It may be one thing to estimate that (use of) building X is responsible for the emission of Y tonnes of CO_2 during the course of a year, but quite another to decide on the most appropriate solutions for reducing Y. Glazing? Energy management system? Movement detection systems associated with the lighting? Radical insulation technologies? The expertise required to assess a building, and these variegated solutions is not, according to our research, readily available. It is therefore expensive. Many of the solutions that might be offered are also expensive – both directly and in terms of opportunity costs"
(private sector, written evidence).

Retrofitting also involves other transaction costs – preparing viable projects, negotiating and executing contracts, and becoming familiar with the new equipment.
(Levine, Ürge-Vorsatz et al 2007).

Box 5: The costs of retrofitting – the case of the John Lewis Partnership

The John Lewis Partnership has set a target to improve energy efficiency in their shops and offices by 20% by 2010 (based on a 2003-04 baseline). The Partnership spends more than £30 million on electricity and gas each year, and has developed a range of measures to reduce its energy use. With the support of the Carbon Trust, a manual describing no cost or low cost energy efficiency tips (like switching off display lighting outside trading hours) has been sent out to all department stores. In Waitrose supermarkets, drawing the night blinds on refrigeration units, which are responsible for more than half of energy usage, reduces consumption by 5%[17]. "We achieved a 15 per cent reduction over three years by having a massive campaign telling all our 69,000 partners, 'If in doubt, turn it off, close the door and don't use it'" (Bill Wright, John Lewis Partnership, witness).

In addition, after a detailed examination of peak and off-peak performance of refrigeration systems, the Partnership decided to invest in more energy efficient equipment (magnetic bearing chillers). Estimates quoted in the Carbon Trust's Management Guide to Low Carbon Refurbishment (2008)[18] show that despite a 50% increase in capital costs relative to standard chillers, cost savings amounted to £54,000 per year, and energy savings 750MWh per year. The payback period was found to be approximately four years.

The owner/occupier responsibility dilemma

Another difficulty related to the economic costs of retrofitting revolves around who pays and who benefits from energy performance improvements. Many commercial buildings are rented and while owners are responsible for the costs of replacing inefficient equipment or improving the fabric of the building, it is occupiers that benefit from savings in their energy bills.

17 See http://www.johnlewispartnership.co.uk/Display.aspx?MasterId=a4107e50-797b-4b99-a02b-c57d17540225&NavigationId=1235 (last accessed June 2008)

18 Carbon Trust (2008) Low carbon refurbishment of buildings, London: Carbon Trust. The John Lewis Partnership is participating in the Carbon Trust's Low Carbon Building Accelerator programme, see www.carbontrust.co.uk/lcba

More fundamentally, simple measures to make energy savings at practically no additional cost are often not implemented due to a significant disconnect between those owning/managing buildings and those paying the energy bills.

"There is a lot that can be done by the occupier without the need for the owner to change expensive equipment. The main barrier is access to information on local controls and switches and open dialogue with the building manager to develop a concerted strategy that minimises energy use without sacrificing comfort"
(private sector, written evidence).

'Quick wins' in non-domestic buildings would help make a difference to the government target to reduce UK emissions by 60% by 2050. Evidence suggests that energy consumption can be reduced at least 20% with little or no cost (private sector, written evidence).

"Supporting and encouraging building services and facilities managers, helping 'sustainability champions' and fostering workplace CRAGs [Carbon Reduction Action Groups] are the kinds of projects that could really make a difference – they might not 'grab the headlines' but neither would they imply the kind of costs that constitute the major block on progress"
(private sector, written evidence).

Addressing the disconnect between owners and occupiers is critical. Stakeholders noted that Government has a central role to play here, leading by example and exerting its leverage as a procurer – as up to 30% of commercial buildings are procured through the public sector (private sector witness).

"If the government estate commits to only take buildings of a certain standard and insists upon green leases [see Box 6], this is likely to result in a modal shift in the property market because they occupy such large tracts of property"
(private sector, written evidence).

Box 6: Green leases

A green lease is a lease containing an agreement between owners and occupiers regarding how the building is to be improved, managed and occupied in a sustainable way. A schedule with detailed provisions for monitoring and improving energy performance, achieving efficiency targets and minimising the environmental impacts of the building is also included (London Climate Change Agency 2007).

Some companies in the UK are already undertaking this practice, such as Hermes, who believe they will receive appreciable premiums on their green leases. Nevertheless, given the diversity of contracts, scepticism remains as to whether it is possible to create a general green lease template.

In Australia green leases are now a common practice, partly as a result of the government encouraging this through its role as a major procurer. In the words of a private sector witness: *"The reason why green leases, as well as the ratings scheme, took over quite suddenly is because the government estate itself is a big client and it said, 'We are only going to procure rated buildings' and a few years later, 'We are only going to sign green leases' to the owner/occupiers, and consequently they dragged the whole of the industry with them in terms of both demand and market share, and I think that is yet to happen here"* (private sector witness).

In addition, several stakeholders emphasised that the government should lead by example (central government agency, written evidence). Although the public sector is committed to reducing its own carbon emissions, a recent report by the Sustainable Development Commission shows that some departments are still not on track to meet their targets (central government agency, written evidence).

Given that the price of energy and the real price of carbon reduction do not appear to be strong enough to drive behavioural change in the short term, many stakeholders agreed that a combination of regulation and fiscal incentives is also needed to help owners and occupiers commit to retrofitting.

Several stakeholders pointed to the fact that regulation has the advantage of providing a level playing field.

"The adoption of different standards at regional or local levels merely causes confusion and frustration"
(regional agency, written evidence).

Some suggested that display energy certificates (DECs), which measure the actual usage of energy, should be rolled out to cover commercial buildings – at the moment these certificates only apply to public buildings (see Box 2). This would provide further incentives for businesses to become more energy efficient.

Displaying information in itself, however, does not guarantee that improvements in energy efficiency will be put into place. In this respect, the inclusion of progressive improvement targets through Building Regulations was recommended by several stakeholders. Some also pointed out that future improvements could be linked to EPC and DEC reports, which are published at regular intervals.

Points were also made with respect to the timing of required improvements. Although regulation could dovetail with the natural cycle of refurbishment to minimise disruption, this may not be sufficient to achieve carbon reduction targets.
A stakeholder suggested that *"Government could sponsor a useful exercise in analysing whether integrating a programme of improving the energy efficiency of existing buildings into this natural cycle would achieve targets in time. This might provide some quantitative data as to how much reliance should be placed on this natural cycle"*
(professional body, written evidence).

Other stakeholders raised concerns over the enforcement of regulation, which falls to local authorities in most cases. As well as introducing new rules, making sure that key actors comply is crucial to driving behavioural change. In the view of a stakeholder representing a professional body:

"Building control now has a remit for post-occupation audit, but this rarely happens. Building control departments should be adequately funded and building control officers trained to undertake these audits so that developers come to expect it"
(professional body, written evidence).

Several private sector stakeholders also pointed out that the expansion of current fiscal incentives should be considered. Most agreed that there is scope to use instruments already in place with appropriate adjustments. In particular, the extension of the Enhanced Capital Allowances scheme to cover other products such as a building's fabric, and reduction of VAT for refurbishment, were mentioned. In addition, it was suggested that reduction in taxes such as stamp duty and business rates (which should feed through to land valuations) could be linked to improvements in energy efficiency (for example, as measured by EPCs and DECs ratings). Nevertheless, further work is needed to assess how effective each tool could be.

Stakeholders also referred to city-level initiatives. Local authorities are increasingly incorporating carbon emission reduction targets into their own performance assessments. Given that city centres and business parks concentrate large stocks of non-domestic buildings, major cities have a clear stake in greening their non-domestic building stock. Most importantly, given cities' scale and knowledge of local circumstances, they can play a key role in facilitating partnerships between owners and occupiers, raising awareness and sharing good practice.

At the international level, major cities have created a network to lead on climate change issues and share best practice (C40 Large Cities Climate Leadership Group). In alliance with this group the Clinton Climate Change Initiative has brought together cities, energy companies and financial institutions through its joint Energy Efficiency Building Retrofit Program (expert, written submission).

On the next page, two case studies from UK cities are examined in more detail (Box 7) – one from the south, London, and one from the north, Bradford. They show what can be done at the local level to encourage reductions in non-domestic building's energy consumption.

Box 7: Greening non-domestic buildings - city level initiatives

The Better Buildings Partnership was developed by the London Climate Change Agency. It brings together large commercial and public property owners who are committed to tackling climate change. Founding members include British Land, Grosvenor Estates, Hammerson, Hermes, Land Securities, Transport for London and the London Climate Change Agency. Others like Canary Wharf, Legal & General, Quintain Development and Estates and Workspace Group have also recently agreed to join.

The objective of the partnership is to develop and disseminate commercial solutions to make building retrofit projects feasible, and to showcase the returns from improving sustainability and accelerating CO_2 reductions. It also promotes valuation models that incorporate sustainability principles, and seeks to develop tools to support retrofit projects, such as benchmarks, green leases, codes for managing agents, and best practices guides[19].

The Partnership also encourages government agencies to exert their leverage power as procurer. When the London Climate Change Agency, the London Development Agency and TfL occupied the Palestra building, they based their decision on energy efficiency grounds. This provides incentives to property companies to incorporate energy efficiency as part of their business plans.

The Better Building Partnership is also committed to facilitating dialogue between property owners and occupiers and showcasing best practice. One example of this was its role in the development and implementation of an energy management strategy for Hermes (commercial property owner) and Jones Lang LaSalle (managing agent) through tenant engagement.

Measures to engage tenants included presentations to tenant representatives convened by the managing agent, Jones Lang LaSalle, and holding of an Energy Awareness Week in the property in question.

19 See http://www.londonclimatechange.co.uk/greenorganisations/making-it-happen/better-buildings-partnership/

This publicised simple energy saving measures, and sought further engagement with tenants. As a result, carbon emissions were cut by 36% over a 6 year period in a multi-tenanted building.

In addition, the facilities management company (Focus FM) also decided to get involved, leading to a specific energy policy targeting a 5% year on year carbon reduction. Finally, tenants also implemented specific changes such as: timer plug adaptors and sensors to automatically switch off printers at night, and sensors to automatically turn off lighting when the office is empty.

Bradford: the Kirkgate shopping centre

Bradford Metropolitan District Council worked with the Kirkgate shopping centre to foster the implementation of energy efficiency measures. The project sought to facilitate coordination between the centre's owner, his management team, and the tenants. A review of the centre's carbon footprint was delivered through interviewing the management teams and undertaking a site audit. Tenants were also interviewed to assess their level of involvement in environmental initiatives.

The project found that there was lack of awareness of capital funding available through government programmes (such as Enhanced Capital Allowances). Measures implemented included encouraging simple behavioural change such as switching off lights, monitors, heaters, printers and copiers and reprogrammed building management systems, timers and lighting levels. Achievements included an 18% reduction in electricity consumption and a 19% reduction in gas usage (local government witness).

These examples show that cities can play a key role in facilitating partnerships between owners and occupiers, raising awareness and sharing good practice. Stakeholders made further suggestions on city level initiatives:

- Several stakeholders pointed to the fact that successful examples need to be publicised more widely across UK cities and regions (local government witness), for example through the creation of regional forums to share best practice.

- On including planning requirements to incorporate low carbon options (e.g. the Merton Rule[20]) there are conflicting views as there is still a lack of knowledge on low and zero carbon technology. While some stakeholders point out that specific targets for renewables provide a boost to the sector, others emphasise that designers need flexibility to suggest the most cost effective solutions in a holistic way (and that more general energy efficiency improvements could then be required through regulation).

- More specifically, some stakeholders argue that community level combined heating and combined heating and power (CH/CHP) constitute a more feasible option.

  "Local authorities do not yet have the full powers to plan and mobilise CH/CHP, nor to mandate connection to existing networks"
  (central government stakeholder, written evidence).

- Some stakeholders also suggested that more funding for planners and building officers' training on sustainable options and technologies is needed[21].

- Given the concentration of large corporate buildings in certain specific areas within cities, a few stakeholders suggested that an area/zone approach to the reduction of carbon emissions should be considered.
  (Lloyd-Jones 2008).

Physical barriers: age and location of buildings

Besides barriers related to the availability of information on energy consumption, the economic costs of retrofitting and coordination between owners and occupiers, there are physical constraints that dictate what is feasible in terms of retrofitting buildings to make them more energy efficient.

Building regulations only started to set energy efficiency standards in 1985,and an estimated 40% of buildings were built before this date (King Sturge 2007/2008).

20 The Merton Rule was introduced by Merton Council and requires developers to comply with a specific target of on site renewables (UK Green Council Building 2007).

21 More generally, the IPPC report identified a need for enhanced skills related to sustainable buildings. "There is a significant need in most countries to create comprehensive, integrated programmes at universities and other educational establishments to train the future building professional in the design and construction of low-energy buildings" (Levine, Ürge-Vorsatz et al 2007).

In addition, certain buildings may not be suitable for specific types of improvements. For example, in certain instances it may be unviable to replace an outdated, inefficient boiler with a cutting edge low carbon CHP, or insulation measures may not be feasible in buildings with single leaf wall constructions.

Listed buildings pose additional difficulties. At present, refurbishment of listed buildings is strictly controlled to preserve historical significance and the "look and feel" of a place (English Heritage 2004)[22].

In addition, other issues such as the location of the building may affect its retrofitting options. For example, low carbon technologies are as yet limited for urban settings, where there is typically lack of solar access, lack of sufficient roof and wall surfaces on which to place photo-voltaic cells and solar thermal panels, and lack of wind for turbines (UK Green Building Council 2007).

This has important implications for the design of policy instruments. In particular, existing stock cannot be retrofitted to comply with 'new build' standards. Therefore, different types of non-domestic buildings may require different benchmarks – albeit along a standard scale. An approach that rewards relative, rather than absolute, improvements may be the way forward. Simply rewarding the highest performer may have unintended consequences if most existing buildings cannot achieve the desired standard. This also reinforces the importance of having both EPCs and DECs. While the DECs show actual energy usage, EPCs provide evidence on what is feasible through design.

22 For a more in depth analysis of the challenges posed by retrofitting in conservation areas, see Lloyd-Jones (2008).

Section 4
Conclusions and recommendations

In Britain, the focus on the carbon footprint of new building stock has diverted attention from existing buildings. Government has made some steps in the right direction with the adoption of energy performance certificates (EPCs) and display energy certificates (DECs). Nevertheless, much remains to be done to overcome the barriers to greening the existing stock of buildings. Central government, together with local government and the private sector, needs to set out a road map for tackling the energy performance of existing non-domestic buildings in the same way it is doing with new stock if the 60% carbon reduction target is to be achieved.

The APUDG recommends that high priority is given to a set of 'quick wins'. Before embarking on more complex retrofitting, there is much that can be achieved by better management of buildings' systems and simple energy savings measures. The private sector – including owners, occupiers and facility managers – and central and local government all have a key role to play. Owners and facility managers need to inform tenants about the appropriate management of buildings' equipment, and tenants need to address behavioural change. Government needs to campaign effectively to get this message across, and to provide the clear and objective data standards that will enable both owners and occupiers to make the appropriate choices. Local government, given its proximity to urban property owners and businesses, is especially well placed to help achieve this. Once the 'quick wins' are achieved, a set of measures should be considered to incentivise different actors to make further progress in improving the energy performance of existing buildings.

The officers of the APUDG, together with the secretariat, have discussed these issues in detail and identified the following policy recommendations, which fall into three main categories: a) raising awareness; b) regulation; and c) fiscal incentives.

Raising awareness

Recommendation 1: better coordination of government agencies

Although government has made progress in raising awareness on energy efficiency, too many departments have a stake in this agenda, often creating confusion among private sector stakeholders. Having one single voice on energy efficiency would achieve more effective dissemination, and ultimately uptake, of energy efficiency measures.

A single central government unit could act as a 'one stop shop'. This unit would be responsible for the delivery of a coherent approach to energy efficiency, bringing together all government actors involved and streamlining the different schemes and policy options that are currently available through a variety of agencies. Stakeholders would then identify this unit as the single point of entry for information. In addition, it would be tasked with ensuring that schemes' procedures are easy to follow. Finally, to ensure that information is widely spread, it is essential that this central government 'one stop shop' unit liaises effectively with local government planners, environmental officers and building control teams. This will help deliver capacity improvements as well.

Recommendation 2: clear advice for owners and occupiers on how to make easy savings

Local government can play a key role in facilitating engagement between major property owners and occupiers. This would help them achieve reductions in energy use and make easy savings (for example, through a better use of buildings' equipment). In addition, successful local level experiences, like the London Better Buildings Partnership, should be shared more widely across other cities and regions.

Other major UK cities should consider the example of London and roll out the London Climate Change Agency model, which could help address the carbon footprint of their large office, retail and factory buildings.

The private sector itself can also play a leadership role in facilitating coordination between owners and occupiers, for example through the introduction of green leases.

Recommendation 3: lead by example, a green government estate

Central and local government can play a bigger leadership role than they have done to date. Government can influence the property market through its major role as procurer. If the government estate commits to only take buildings of a certain standard and insists upon green leases, this is likely to result in a shift in the property market, due to the public sector's sheer size and importance.

In addition, government could lead by example, putting into place those measures it requires from businesses and households.

Even if government has committed to improve the energy efficiency of its estate, reports by the Audit Commission and the Sustainable Development Commission have shown that still much needs to be done for government to meet its own set of targets.

A greener government estate will require investments in capacity at both central and city level. Regular training on state of the art sustainable options and technologies is needed for planners and building officers.

Regulation

Recommendation 4: establish a single measurement framework for non-domestic buildings

In order to increase energy efficiency, it is crucial to have a standard measurement and common benchmarks. With EPCs and DECs coming into force, progress has been made in terms of establishing standard measurement systems. Although ratings for a building's design energy performance are already in place, there is not a standard framework to measure non-domestic properties' actual operational use of energy. Despite the difficulties posed by the different forms and uses of non-domestic property there is a need to develop a single framework indicating benchmarks and ratings for different property types based on their operational use of energy.

In addition, establishing a national building performance database where energy bills could be logged (UK Green Building Council 2007) would allow for transparent performance tracking – contrasting a building's actual performance with initial design assumptions.

Recommendation 5: extend DECs to privately-owned commercial buildings

At present DECs are only required for large public buildings. Given that DECs measure the actual operational use of energy, it is crucial that these are extended to cover commercial buildings as well. As required by regulation, for these certificates to be effective, it is key that they are visibly displayed. Furthermore, other ways of publishing this information, such as a website and the production of league tables should also be encouraged.

Rolling out this rule to cover all non-domestic buildings gives investors a clear signal that the future trajectory of government regulation is towards better performing buildings.

This would provide investors with incentives to take a long term view and factor in the energy performance of their buildings when considering the future value of their properties. Before this regulation becomes mandatory, government and the property industry could encourage the voluntary adoption of these certificates, as some are already doing.

Recommendation 6: raise energy efficiency standards using building regulations

A requirement to display information on a building's energy performance is a prerequisite, but will not necessarily drive behavioural change on its own. The following changes in building regulations could encourage progressive improvements in energy efficiency:

- progressive ratcheting up of energy efficiency requirements in Part L;
- require specific improvements, e.g. replacement of less efficient boilers;
- extend consequential improvement provisions so that they impact on a building at trigger points other than refurbishment or extensions. Government could analyse whether additional trigger points should be added, rather than rely on natural refurbishment cycles.

Once the EPCs and DECs framework beds down and key stakeholders become familiar with it, relative improvements could be linked to the reports produced alongside these certificates.

Reommendation 7: ensure effective enforcement of regulation

The right rules may not incentivise change if compliance is not widespread. It is important that mechanisms are put in place to ensure enforcement. Clear guidance needs to be provided for those required to issue and hold EPCs and DECs, and for local trading standard officers responsible for enforcement.

The government should encourage the development of a well regulated carbon market to facilitate greener and more efficient commercial energy usage. In the meantime, EPCs and DECs could help to 'name and shame' the worst owners/ managers, and could help green-minded tenants make better choices.

In addition, improved policing of building regulations is required (UK Green Building Council 2007), especially when it comes to post-occupation inspections, so that developers come to expect them. In other words, checks need to take place not just based on plans and proposals, but also after completion.

Fiscal incentives

Reommendation 8: examine the fiscal consequences and effectiveness of different fiscal incentives/grants related to improvements in energy efficiency

Once 'quick win' measures are put in place (e.g. switching equipment and lights off), there is scope to consider in the medium to long term a range of fiscal incentives/grants to retrofit buildings and help owners deal with upfront costs.

The fiscal consequences and implementation difficulties surrounding the use of different existing tax mechanisms (e.g. reduction in VAT for refurbishments; stamp duty; business rates; Enhanced Capital Allowances) need to be carefully studied.

A closer examination of energy price elasticities, in both the non-domestic and residential sectors, would also help with the design of fiscal incentives. Finally, the differential impact and fiscal incentives needed for big and small enterprises also needs to be taken into account.

REFERENCES

Atisreal (2008) 'True' sustainability and the UK property market, London: Atisreal.

Austin, P, Rydin, Y and Maslin, M (2008) Climate change. The risks for property in the UK, London: UCL Environment Unit, report commissioned by Hermes and Usptream.

Bell, M (2008) Are developers ignoring the threat of climate change? http://www.bdonline.co.uk/story.asp?sectioncode=427&storycode=3115115&c=1&encCode=00000000014ebec7 (last accessed June 2008).

BERR (2008) Energy Bill 2007-2008 http://www.berr.gov.uk/energy/bill/page40931.html (last accessed June 2008).

BERR (2007) Energy billing and metering. Changing consumer behaviour, London: BERR.

Boardman, B (2007) Home truths: A low carbon strategy to reduce UK housing emissions by 80% by 2050, Oxford: University of Oxford.

BPF (2008) Factsheet on Non-Domestic Energy Performance Certificates, London: BPF.

BRE (2006) Scoping Study: Opportunities for Reducing the Carbon Footprint of Existing Non-Domestic Buildings, London: BRE.

BRE (2005) Reducing carbon emissions from commercial and public sector buildings in the UK, London: BRE.

Building (2006) The 99% campaign – greening the stock we're stuck with http://www.building.co.uk/story.asp?storycode=3069312 (last accessed June 2008).

Carbon Plan (2008) The value of sustainable property. Report for Bridges Community Ventures, London: Carbon Plan.

Carbon Trust (2008) Low carbon refurbishment of buildings, London: Carbon Trust.

Carbon Trust (2008) Enhanced Capital Allowances http://www.carbontrust.co.uk/energy/takingaction/eca.htm (last accessed June 2008).

Carbon Trust (2008) Low carbon building accelerator http://www.carbontrust.co.uk/technology/technologyaccelerator/lcba.htm (last accessed June 2008).

Carbon Trust (2007) Carbon footprinting. An introduction for organisations, London: Carbon Trust.

CIBSE (2004) Guide F Energy efficiency in buildings, London: CIBSE.

CIBSE (1999) Environmental factors affecting office worker performance: review of evidence, London: CIBSE.

CLG (2008) Improving the energy efficiency of our buildings. A guide to Display Energy Certificates and advisory reports for public buildings, London: CLG.

CLG (2008) Energy performance of buildings. Overview http://www.communities.gov.uk/planningandbuilding/theenvironment/energyperformance/overview/ (last accessed June 2008).

CLG (2007) Regulatory impact assessment energy performance of buildings directive articles 7-10, London: CLG.

CLG (2007) Commercial and industrial floorspace and rateable value statistics (2005 Revaluation) http://www.communities.gov.uk/publications/planningandbuilding/commercialfloorspace (last accessed June 2008).

CLG (2006) Review of sustainability of existing buildings, London: CLG.

Creamer, M (2008) Testing the conscience of tenants .

Cushman & Wakefield (2007) Business Briefing. Landlord and Tenant Survey, London: Cushman & Wakefield.

DEFRA (2008) UK legislation: taking the Climate Change Bill forward – progress http://www.defra.gov.uk/environment/climatechange/uk/legislation/ (last accessed June 2008).

DEFRA (2007) UK Energy efficiency action plan 2007, London: DEFRA. http://www.defra.gov.uk/environment/climatechange/uk/energy/efficiency/index.htm (last accessed June 2008).

DEFRA (2007) UK Insulation sector. Supply chain review - Final report, London: DEFRA.

DEFRA (2005) Emissions of carbon dioxide by local authority areas http://www.defra.gov.uk/Environment/statistics/globatmos/galocalghg.htm (last accessed June 2008).

Dixon, T et al (2007) A Green Profession? RICS Members and the Sustainability Agenda.

Durana, M, Monga, T and Prettre, H (2007) Energy Efficiency: The Global Case for Efficiency Gains, The London Accord, London: Credit Suisse http://www.london-accord.co.uk/accord_2007/contents.htm (last accessed June 2008)

The Economist Intelligence Unit (2008) Doing good. Business and the sustainability challenge, London: The Economist Intelligence Unit.

Efiong, A (2007) Energy efficiency. The potential for selected business opportunities, The London Accord, London: Merrill Lynch http://www.london-accord.co.uk/accord_2007/contents.htm (last accessed June 2008).

English Heritage (2004) Building regulations and historic buildings, London: English Heritage.

Financial Times (2008) Oil smashes to record above $139 a barrel http://www.ft.com/cms/s/0/9c732bb8-33c2-11dd-869b-0000779fd2ac.html (last accessed June 2008).

REFERENCES cont.

GLA (2007) Action today to protect tomorrow. The Mayor's climate change action plan, London: GLA.

GVA Grimley (2007) Sustainability: towards sustainable offices, London: GVA Grimley. http://www.gvagrimley.co.uk/PreBuilt/Research%20web/Occasional%20Bulletins/Towards_Sustainable_Offices_Apr07.pdf (last accessed June 2008).

HM Treasury (2008) Budget 2008 Stability and Opportunity: Building a Strong, Sustainable Future, London: HM Treasury.

HM Treasury/Cabinet Office (2007) Stern Review on the Economics of Climate Change, London: HM Treasury.

HM Treasury (2006) Report of the task Group on business energy efficiency and advice, London: HM Treasury.

Intergovernmental Panel on Climate Change (2007) Climate Change 2007: The Physical Science Basis, Geneva: IPPC.

House of Commons Committee of Public Accounts (2008) Improving the efficiency of central government's use of office property, London: House of Commons.

House of Commons Communities and Local Government Committee (2008) Existing housing and climate change, London: House of Commons.

IEA (2008) Worldwide trends in energy use and efficiency, Paris: OECD/IEA.

IEA (2007) Mind the gap. Quantifying principal-agent problems in energy efficiency, Paris: OECD/IEA.

IPD (2008) Environmental Code, London: IPD.

Jones, A (2007) Greening growth. How local government can build the green economy, London: Local Government Information Unit.

Keay, M (2006) The UK energy review and decentralised generation. Oxford Energy Comment, Oxford: Oxford Institute for Energy Studies. http://www.oxfordenergy.org/pdfs/comment_0606-2.pdf (last accessed June 2008).

Kingsley Lipsey Morgan and IPD Occupiers (2008) UK Occupier Satisfaction Index 2008 http://www.occupier-satisfaction.co.uk/ (last accessed June 2008).

King Sturge (2007/2008) European Property Sustainability Matters – places, people, investment values and the law http://resources.kingsturge.com/contentresources/library/0/research/2007/01Oct/181020074137_pdf.pdf (last accessed June 2008).

Levine, M D, Ürge-Vorsatz, K et al (2007) Residential and commercial buildings. In Metz B et al (eds) Climate Change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge and New York: Cambridge University Press. http://www.ipcc.ch/ipccreports/ar4-wg3.htm

LGA Climate Change Commission (2008) A climate of change, London: Local Government Association.

London Climate Change Agency (2008) London Better Buildings Partnership http://www.londonclimatechange.co.uk/greenorganisations/making-it-happen/better-buildings-partnership/ (last accessed June 2008).

Lloyd-Jones (2008) Retrofitting Soho: Draft Report on Soho Pilot Study for Retrofitting and Sustainability for City Centres, London: Max Lock Centre, University of Westminster and Soho Community Environment Fund.

Mc Kinsey & Company (2007) Reducing US greenhouse emissions. How much at what cost? http://www.mckinsey.com/clientservice/ccsi/pdf/US_ghg_final_report.pdf (last accessed June 2008).

The Observer (2008) Developers accused of pursuing gadgetry instead of saving planet http://www.guardian.co.uk/environment/2008/may/31/greenbuilding.ethicalliving (last accessed June 2008).

Ogden, D H (1996) Boosting Prosperity: Reducing the Threat of Global Climate Change Through Sustainable Energy Investments, California: Energy Foundation.

McAllister, I (2007) Transforming existing buildings: the green challenge – Final report London: RICS and Cyril Sweett. http://www.rics.org/NR/rdonlyres/381CCB81-EF08-45B9-B42C-54735E0ABF20/0/TransformingExistingBuildingsTheGreenChallenge.pdf (last accessed June 2008).

Property Week (2008) Property faces growing burden of energy certificates http://www.propertyweek.com/story.asp?sectioncode=274&storycode=3115087&c=4 (last accessed June 2008).

Sunday Times (2008) Surging energy costs hit UK plc http://business.timesonline.co.uk/tol/business/industry_sectors/utilities/article4138498.ece (last accessed June 2008).

Sustainable Development Commission (2007) Sustainable development in government. Annual report 2007, London: Sustainable Development Commission. http://www.sd-commission.org.uk/publications/downloads/sdig_report_2007.pdf (last accessed June 2008).

UK Green Building Council (2007) Report on carbon reductions in new non-domestic buildings, London: CLG. http://www.communities.gov.uk/publications/planningandbuilding/carbonreductions (last accessed June 2008).

ANNEX

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Sandra Gomez,
Technical Director Energy & Sustainability Group, CB Richard Ellis

Richard Isaac,
Environmental Policy Unit, Bradford City Council

Allan Jones,
Chief Executive Officer, London Climate Change Agency

Paul King,
Chief Executive, UK Green Building Council

Jon Lovell,
Head of Sustainability, Drivers Jonas

Hilary Reid Evans,
Head of Sustainability Initiatives, Quintain Estates and Development PLC

David Vincent,
Director of Policy, Carbon Trust

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Written submissions

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