A report by the Westminster Sustainable Business Forum and Carbon Connect

Westminster sustainablebusiness Forum

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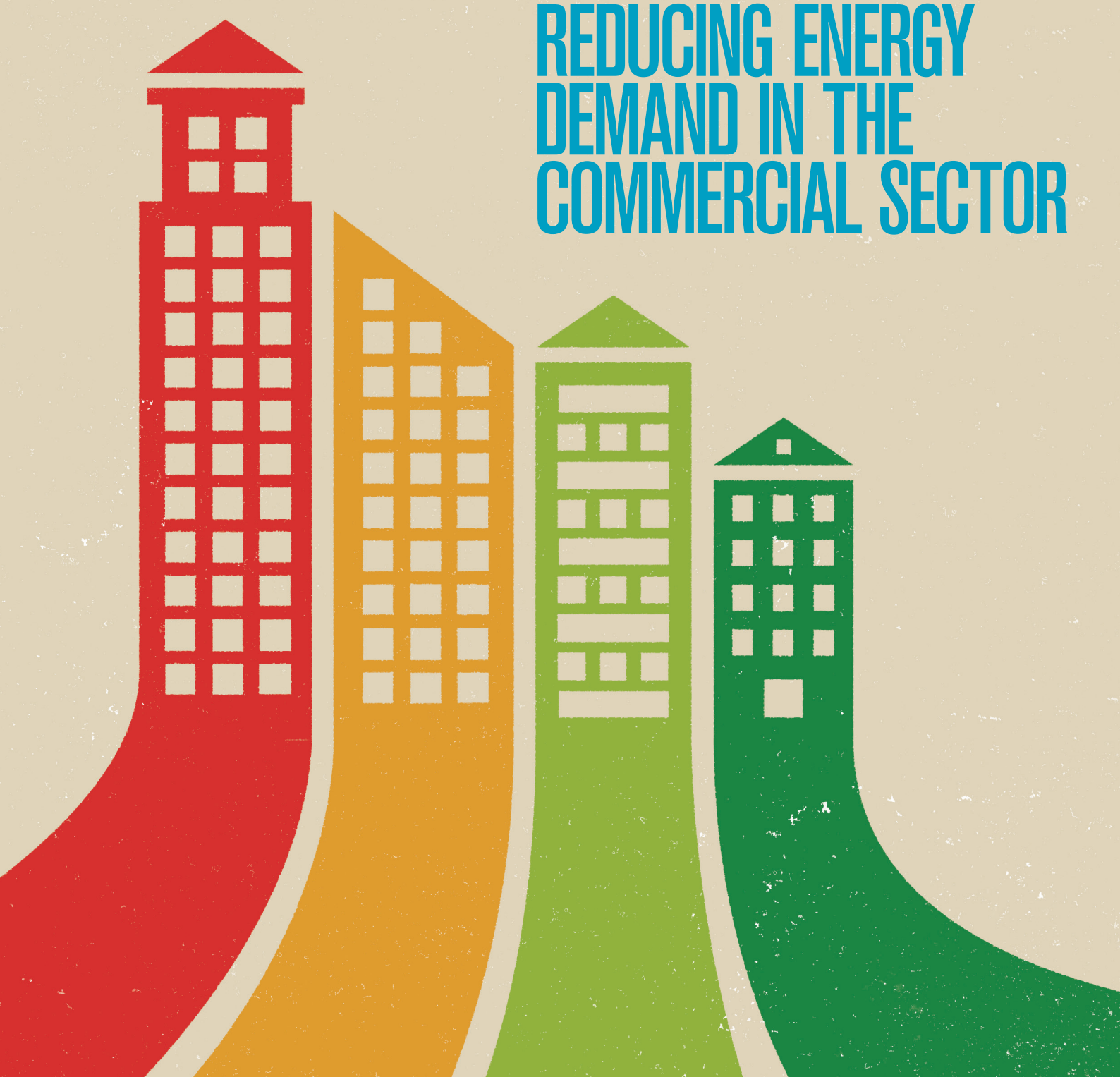
BUILDING EFFICIENCY

REDUCING ENERGY DEMAND IN THE COMMERCIAL SECTOR



This report calls for greater investment in commercial sector energy efficiency to convert a threat to profitability into an opportunity for business. It makes recommendations to Government on how it can help stimulate the market.

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FOREWORD

Commercial sector buildings are responsible for 10% of the UK's greenhouse gas emissions. At the same time UK businesses are thought to be collectively missing out on a cost-saving opportunity of up to £1.6 billion through investment in energy efficiency. This is on top of a potential increase in worker productivity of 14% from investment in environmental systems such as better temperature and ventilation control.

Clearly, in this tough economic climate there is a lot to be gained from increasing the energy efficiency of buildings in the commercial sector whilst simultaneously helping the UK to meet its 2050 Climate Change Act targets.

However, despite the obvious business case for investment in energy efficiency, take up has historically been low.

This timely report explores why adoption of energy efficiency measures may be so low and makes recommendations to Government on how barriers to take up could be overcome. Case studies also show where different organisations are leading the way.

One barrier that stands in the way for many SMEs and micro-businesses in particular, is a lack of available upfront capital to invest in energy efficiency. One solution, the Green Deal, an energy efficiency financing scheme that has received a great deal of press in the domestic sector, is technically 'open for business' in the non-domestic sector. This report calls on the UK Green Investment Bank to fund a non-domestic subsidiary of The Green Deal Finance Company, under guarantee from HM Treasury, to offer low interest loans to SMEs to stimulate the market for energy efficiency. This is an excellent way of providing low cost SME-finance without any cash injection by Government, just the use of its guarantee facilities.

The truth is though, even when finance is not the obstacle and the upfront cost of energy efficiency can be absorbed by a commercial business, energy efficiency measures are still not being installed to the extent they could, or should be.

This report uncovers why this might be the case and what can be done to stimulate take up. It is clear that there is a lack of understanding and leadership right at the top of commercial businesses to take action to invest in energy efficiency. The Government needs to be clearer about all of the non-domestic energy efficiency programmes available to the commercial sector and an energy efficiency 'hub' website must be created to guide senior executives through investment in energy efficiency.

Equally, the proposed Energy Savings Opportunity Scheme (ESOS), designed to meet the requirements of the EU Energy Efficiency Directive, subjecting all large businesses to an energy audit, must require senior executive sign-off of an energy assessor's report so we can stimulate buy-in from the top. We believe this is the only way to stimulate the kind of behaviour change needed throughout an organisation to ensure that a culture of energy efficiency is embedded, embraced and understood.

But there are other barriers to be addressed, particularly around that of the split incentive between landlord and tenant, to investment in energy efficiency. This barrier, arising from landlords not directly feeling the cost of energy bills and therefore suffering from a lack of incentive to invest in energy efficiency, combined with tenants' lease lengths being shorter than payback periods on some energy efficiency measures, must be overcome.

Energy Performance Certificates meeting at least an 'E' rating will be required from landlords of commercial buildings from 2018 and this will, no doubt, stimulate the market for energy efficiency investment and overcome some split incentive issues. But this report calls on the Department for Communities and Local Government to introduce a strong penalty for non-compliance to properly enforce the regulation and accelerate the changes needed.

The Government also needs to consider extending the length of time that landlords receive empty property rate relief from Local Authorities on the condition that the landlord installs measurable energy efficiency improvements in this time.

It is our hope that the recommendations in this report are taken up by Government and that they stimulate a vibrant market for energy efficiency in the commercial sector. The need to increase the resilience of our businesses against the threat of climate change, and energy price volatility, in addition to the obvious cost savings, and side-benefits, that can be realised from energy efficiency mean now is the time to invest on a large scale.

We would like to thank everyone who gave their time and expertise to this inquiry. We would also like to especially thank the steering group for all of their hard work. We are grateful to Rockwool and Siemens for generously sponsoring the inquiry and Rachel White and Geoff Archer for compiling this report.

Lord Whitty
Inquiry Co-Chair

Oliver Colvile MP
Inquiry Co-Chair

EXECUTIVE SUMMARY

The case for investment in energy efficiency

Commercial sector buildings are responsible for 10% of the UK's greenhouse gas emissions. They must become more energy efficient to meet the UK's 2050 carbon reduction targets in an affordable way. There are also significant benefits to the economy from further stimulating the UK's £17.6 billion energy efficiency market which currently supports 136,000 people.

This report highlights that a combination of an increasing reliance on electricity, Government policy impacts on energy bills, and future energy price volatility, presents a threat to the profitability of 'UK plc'. This could be neutralised through investment in energy efficiency, taking advantage of an estimated £1.6 billion worth of cost savings open to the commercial sector.

The benefits to be gained from energy efficient buildings go beyond the financial and include 'softer' benefits such as improved worker productivity, of 11% and 3%, from better temperature control and ventilation respectively. This demonstrates that the aesthetic benefits of energy efficient buildings should be a major factor in businesses' cost-calculations of the impact of energy efficiency investments on their core business.

Understanding the risks and barriers for energy efficiency investment

This report finds that despite a compelling business case, the commercial sector is failing to link business growth to energy costs. Failure to invest in energy efficiency brings with it significant cost, regulatory, and reputational risks and more must be done to help both small and larger businesses relate these to their 'bottom line'.

There are also a number of internal barriers that prevent businesses from investing in energy efficiency. These stem from energy efficiency improvements not being aligned with the overall strategic goals of the organisation; a lack of the right skills and understanding to implement energy efficiency investment, particularly in smaller organisations; and a lack of communication and buy-in from across departments in larger organisations.

These barriers could be overcome with better information on the energy performance of UK commercial buildings. This would allow for benchmarking for energy efficiency and create more competition. The Department of Energy and Climate Change (DECC) has recently announced the development of an improved non-domestic energy-use database and it is crucial that this accounts for differently-sized businesses across all industry sectors.

The forthcoming Energy Savings Opportunity Scheme (ESOS) offers an excellent opportunity to gain executive level buy-in to energy efficiency investments. This will help overcome understanding and communication barriers in the commercial sector and encourage leadership from the top of an organisation for implementing energy efficiency. However, ESOS must require senior level sign-off of the Assessors report in order to help achieve this.

Recommendation 1

The Government should compile a comprehensive database for the energy performance of UK commercial buildings. This would be facilitated by working initially with the commercial property industry.

Recommendation 2

The Government should require that the ESOS Assessor's final report obtain sign-off by a senior executive such as the Chief Financial Officer, or Managing Director, within a qualifying organisation, before deemed to meet the ESOS requirements.

Central and local government's role in stimulating commercial sector energy efficiency

The non-domestic Green Deal is 'open for business', however awareness of the scheme is low throughout the business community as indicated by this inquiry's own primary research. A 're-launch' of the scheme would rekindle the interest of potential Green Deal customers, particularly SMEs, and should be based upon a 'street-by-street' roll-out, supported by a DECC-hosted 'hub' website.

A renewed focus on the Green Deal will require a funding boost and this can be provided either through funding from central Government or via a short-term raise of the Local Authority borrowing cap. Buy-in from multiple Government departments is crucial in this regard and this inquiry encourages DECC and HM Treasury to work together closely on this issue.

The energy efficiency market can also be stimulated through the network of Local Enterprise Partnerships (LEPs). By placing greater emphasis on the importance of energy efficiency in future funding guidance to LEPs, issued for 'Growth Deals', the Government can make use of LEPs' capacity to guide economic development in local areas.

Recommendation 3

The Government should use a national advertising and sector-specific marketing campaign, to re-launch the non-domestic Green Deal scheme. This should be supported by a 'hub' website, hosted by DECC, with easy-to-follow guidance on all non-domestic energy efficiency schemes.

Recommendation 4

The Department of Energy and Climate Change should work with HM Treasury to secure funding to support a targeted 'street-by-street' promotion of the non-domestic Green Deal, to increase awareness and take up.

Recommendation 5

The Government should include strong guidance to encourage the inclusion of specific energy efficiency measures in the future Growth Deals to be submitted by LEPs.

Financing energy efficiency

Given the high upfront costs and sometimes lengthy payback on investments for energy efficiency projects, businesses often have to seek finance for such projects from third party sources. Green Deal finance may provide one such source of finance. However, structural changes to the scheme need to be made, in particular the removal of the 'Golden Rule' for the non-domestic scheme. This would prevent businesses being constrained from making more comprehensive energy efficiency retrofits. The Government should also ensure that Green Deal Assessments accurately reflect a commercial organisation's energy usage.

Despite the presence of the non-domestic Green Deal, there is a need for further innovative finance products, especially for the SME segment of the commercial-sector market. One innovative approach would be for a non-domestic subsidiary of The Green Deal Finance Company to provide low-interest SME loans. This would require funding from the UK Green Investment Bank and should utilise the strength of the Government's balance sheet by making use of HM Treasury's guarantee facility.

In addition, this report takes a brief look at the usefulness of the Energy Service Company model as an alternative source of third party finance for energy efficiency and considers the potential of the public sector RE:FIT programme for implementation in the commercial sector. This includes better integration of the International Performance Measurement and Verification Protocol into existing non-domestic energy efficiency schemes.

Recommendation 6

The Government should remove the 'Golden Rule' requirement attached to the non-domestic Green Deal.

Recommendation 7

The UK Green Investment Bank should fund a non-domestic subsidiary of The Green Deal Finance Company, under guarantee from HM Treasury, to offer low-interest loans to SMEs to stimulate the market for energy efficiency.

Recommendation 8

The Government should profile case studies from the RE:FIT programme and outline where it has been a success so far and what lessons could be learned for implementation in the commercial sector.

Recommendation 9

The Government should integrate a version of the International Performance Measurement and Verification Protocol (IPMVP) into existing energy efficiency schemes such as the non-domestic Green Deal to promote the use of a universal framework for Measurement and Verification (M&V).

Overcoming split incentives in commercial property

The report finds that the problem of split incentive prevents investment in energy efficiency measures and is particularly acute in commercial buildings owing to the large number of tenants often present in this type of building. Whilst policies requiring the production of Energy Performance Certificates (EPCs), and in some cases Display Energy Certificates (DECs), should stimulate compliance with energy efficiency regulation, their take up at present is poor. Only 26% of domestic and 39% of non-domestic rentals are known to have provided EPCs as required. In addition to Government more generally, the Department for Communities and Local Government (DCLG) must take the lead on enforcing the production of energy efficiency certification in its own buildings and introduce a strong penalty for non-compliance.

Certainty for landlords to invest in energy efficiency is an essential companion to these regulations and the Government must engage with wider industry to produce a clear timetable for future policy changes in this area, following the example of the 'Low Carbon Routemap for the Built Environment' produced by the Green Construction Board. Similarly, reducing the risk of installing energy efficiency measures can help to increase the appetite of landlords to make such improvements. DCLG should therefore facilitate an extension of the time period over which empty property rate relief is provided from Local Authorities to allow landlords to make energy efficiency improvements to their buildings in the void period between former and incoming tenants.

Recommendation 10

The Department for Communities and Local Government should introduce a strong penalty for non-compliance with minimum EPC standards to properly enforce the regulation.

Recommendation 11

The Government should visibly enforce DEC legislation for its own buildings to demonstrate the importance of sustainable buildings.

Recommendation 12

The Department for Communities and Local Government should work with commercial landlords to establish a clear industry routemap for future increases in energy performance standards, for example EPCs & DECs, for commercial buildings.

Recommendation 13

The Government should extend the length of time that landlords can receive empty property rate relief from Local Authorities to 12 months. This relief should only be made available on the condition that energy efficiency improvements are being made on the property and proven by it receiving an increased EPC score.

1 INTRODUCTION

Buildings account for 37% of the UK's greenhouse gas (GHG) emissions[1]. The UK's buildings must become more energy efficient to meet the UK's 2050 carbon reduction targets in an affordable way. Buildings in the commercial sector have an important role to play, accounting for 10% of the UK's GHG emissions overall[2]. However, there are other gains to be had from the commercial sector investing in energy efficiency measures, such as countering and reducing the effect of volatile energy costs, increasing business competitiveness, reducing overall UK energy demand and increasing the UK's energy security.

The business case and opportunity to introduce energy efficiency measures already exists. Businesses can self-finance or gain third party finance, for energy efficiency measures through a number of energy efficiency financing schemes, yet take up has been poor throughout the commercial sector.

This report explores the financing opportunities for installing energy efficiency measures further and makes recommendations to Government and industry on where schemes could be improved such as the non-domestic Green Deal, or new financing opportunities introduced, particularly for small and medium sized enterprises (SMEs). Despite this, economic incentives alone are not enough to bring about the radical transformation that we need. There are also a number of behavioural barriers to the take up of energy efficiency measures that must be addressed.

This report therefore suggests a range of measures to encourage the take up of energy efficiency in the commercial sector so that it can realise the potential savings that can be gained from this opportunity:

- Stronger financial incentives;
- Better regulation;
- Leadership and buy-in at the executive level of an organisation;
- Campaigns at the national level with tailored local campaigns.

The benefits of investing in energy efficiency are large and with this report we hope to help stimulate the change necessary for the commercial sector to fully realise them.

1.1 Defining the commercial sector

The scope of this report includes buildings used for activities such as wholesale and retail trade; activity associated with warehousing operation and maintenance; and real estate activities (such as buying, selling and maintaining real estate)[3]. Many of these activities, in addition to professional, technical and administrative work, are carried out within an office location which makes up a large part of the scope of this report.

1 Committee on Climate Change (2013) 'Meeting Carbon Budgets – 2013 Progress Report to Parliament'
2 Department of Energy and Climate Change (2011) 'The Carbon Plan: Delivering our low carbon future', p. 114
3 The commercial sector in this report is defined using: Office for National Statistics (2009) 'UK Standard Industrial Classification of Economic Activities 2007 (SIC 2007)'

Several of the activities classified as 'commercial' contain an element of transportation activity. However, this report does not look at energy usage, and subsequent carbon emissions, arising from transportation in any form. In order to further narrow the scope of this report, the term 'commercial' fully excludes energy usage arising from public-sector buildings and from manufacturing processes. As a result the 'commercial' segment of the non-domestic sector being investigated by this report typically includes buildings such as office blocks, retail buildings, shopping centres, industrial estates and warehousing.

1.2 An overview of the commercial property sector

1.2.1 Size

The commercial property market in the UK is estimated to be worth approximately £717 billion and is almost directly comparable to the entire worth of the UK's stock of plant, machinery and vehicles[4]. Improving the value of this stock is therefore not only of importance to real estate investors but also to the UK's economy and society more generally.

1.2.2 Property types

As illustrated in Figure 1 the commercial property sector is composed of multiple property-types. Core commercial property comprises retail, office, warehousing, and factory property and dominates the commercial sector with a combined value of approximately £617 billion.

1.2.3 Occupancy

Over half (51%) of organisations in the UK's commercial sector rent the space in which they carry out their business activities and this is set to increase in the future[5]. This is due to organisations increasingly being reluctant to commit the capital and management time required to own their own premises[6]. The numbers of commercial organisations renting property makes the task for policy-makers, of negotiating the 'landlord-tenant relationship' when designing energy efficiency policy, all the more imperative.

1.2.4 Current levels of energy efficiency take up

Current levels of energy efficiency retrofit take up vary according to the size of the organisation and the type of property. A recent survey carried out by EEVS and Bloomberg New Energy Finance supports this. The survey of both suppliers and customers, found that although just over 74% of their respondents reported take up of some form of energy efficiency, there are strong variations in take up between differently sized organisations[7].

4 Property Industry Alliance (2013) 'Property Data Report 2012'
5 Property Industry Alliance (2010) 'Property Data Report 2010'
6 Ibid
7 EEVS & Bloomberg New Energy Finance (2013) 'Energy Efficiency Trends: Annual Report 2012/13 – Essential insight for consumers and suppliers of non-domestic energy efficiency'

Large corporates were shown to be *leading the way* with nine out of ten stating that they had commissioned energy efficiency projects. This is unsurprising given the resources that this size of business is likely to be able to deploy for energy efficiency projects. This is supported by a recent survey by the Confederation of British Industry (CBI) which found that 91.2% of respondents rated the priority of energy efficiency to their business as *high* or *quite high* compared to 1.1% who said *not at all*[8].

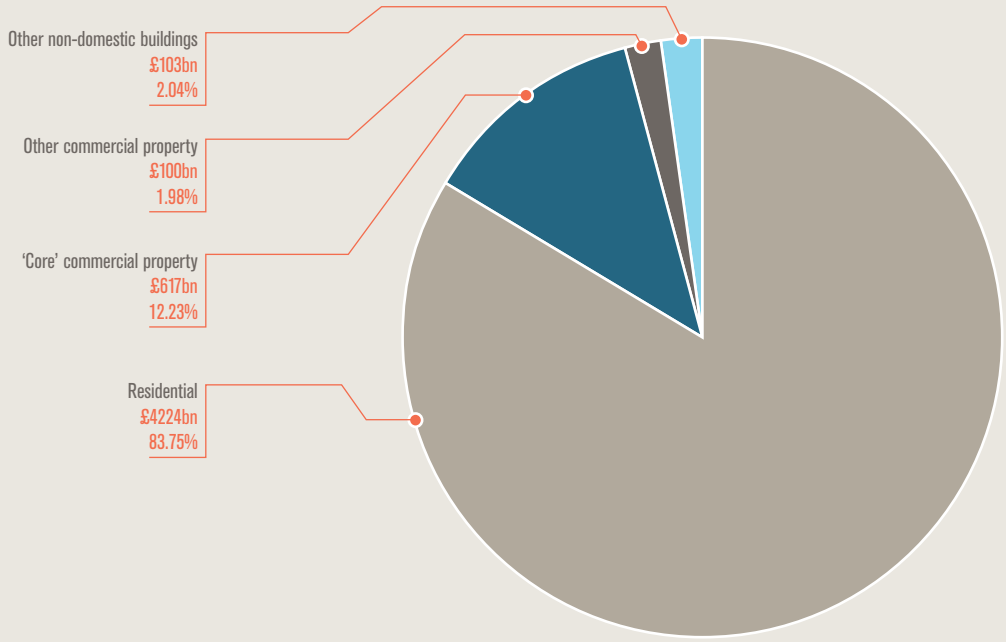
Office buildings are the most retrofitted type of commercial building with almost 25% of reported retrofits in the commercial sector[9]. However, other types of commercial building have not received as high levels of attention for retrofit projects with warehousing, laboratories, data centres, restaurants and bars, and retail space making up less than 5% of surveyed properties being retrofitted[10].

There are also some specific technologies that are taken up more than others when improving energy efficiency. Currently lighting and lighting controls are the most highly commissioned energy efficiency measure whilst Heating, Ventilation and Air Conditioning (HVAC) technologies have, to date, received relatively little attention[11]. This suggests that businesses are beginning to take advantage of technologies with lower upfront costs. Equally, 'behaviour change' features highly as a commissioned measure to increase energy efficiency in the commercial sector, presumably as it represents an immediate low cost solution for many businesses.

8 Confederation of British Industry (2013) 'Shining a light: Uncovering the business energy efficiency opportunity'
9 EEVS & Bloomberg New Energy Finance (2013) 'Energy Efficiency Trends: Annual Report 2012/13 – Essential insight for consumers and suppliers of non-domestic energy efficiency', p. 9
10 Ibid
11 Ibid, p. 7

Figure 1: UK property market

Overview of UK property sectors

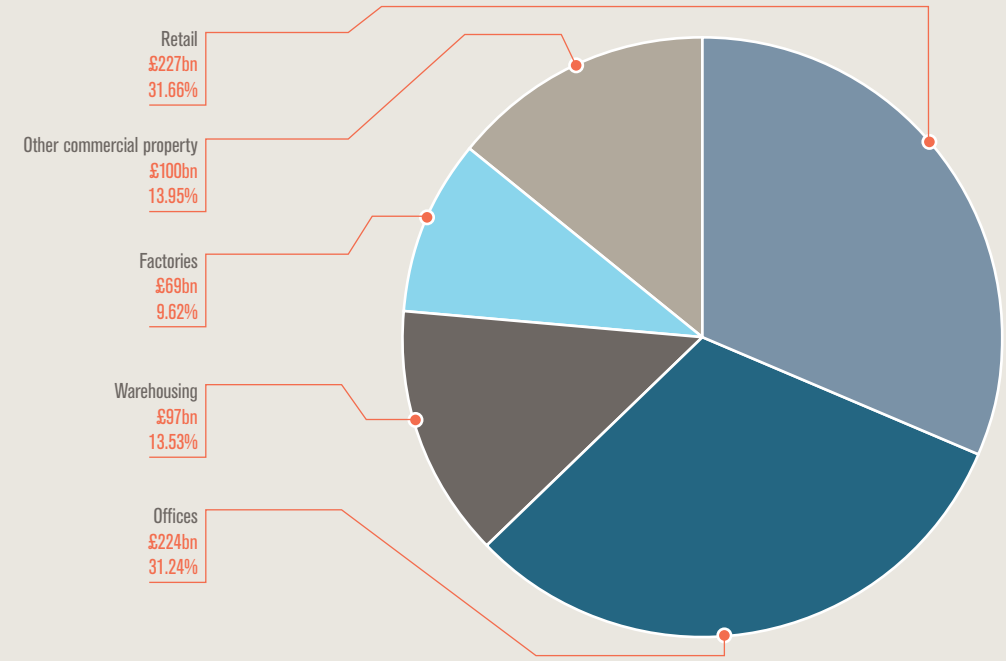


DATA

Total Value:	**£5044bn**
Residential:	£4224bn 83.75%
'Core' commercial property:	£617bn 12.23%
Other commercial property (cinemas, theatres, etc.):	£100bn 1.98%
Other non-domestic buidlings:	£103bn 2.04%

Source: British Property Federation (2013) 'Property Data Report 2012'

Main commercial property sectors



DATA

Total Value:	**£717bn**
Retail:	£227bn 31.66%
Offices:	£224bn 31.24%
Other commercial property (cinemas, theatres, etc.):	£100bn 13.95%
Warehousing:	£97bn 13.53%
Factories:	£69bn 9.62%

Source: British Property Federation (2013) 'Property Data Report 2012'

2 THE CASE FOR INVESTMENT IN ENERGY EFFICIENCY

2.1 The wider climate change and energy context

2.1.1 Meeting the UK's Carbon Budgets

The Climate Change Act (2008) demonstrated the UK's commitment to reducing its carbon emissions and signalled policy changes to move towards a 'low carbon economy'. The Act sets a target of an 80% reduction, on 1990 base year levels, of greenhouse gas (GHG) emissions by 2050[12]. Interim targets for carbon emissions, in the form of carbon budgets, are being set to help the UK meet its 2050 target and progress on these is monitored by the Committee on Climate Change (CCC)[13].

2.1.2 Carbon emissions from buildings

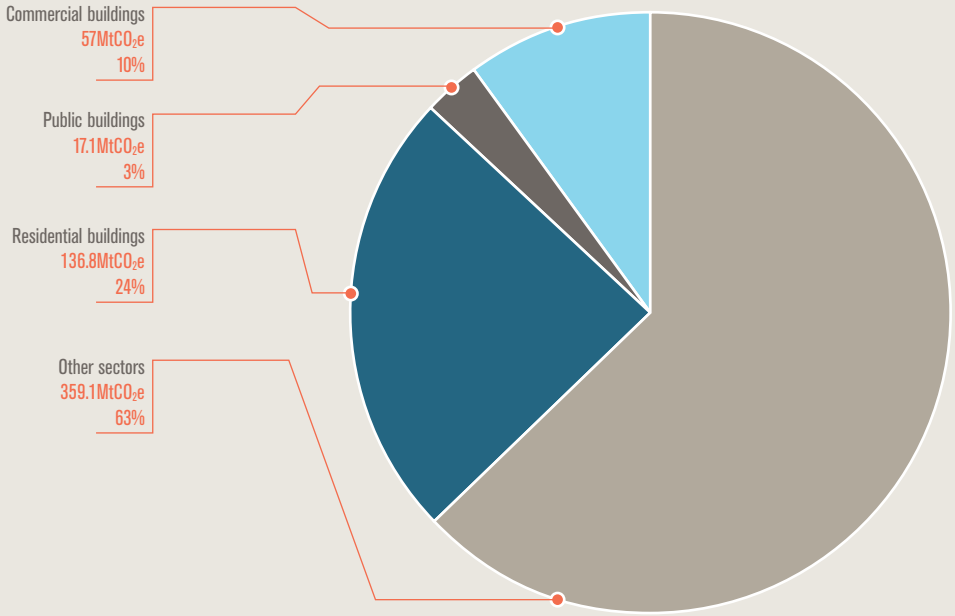
In 2012, buildings accounted for 37% (210.9 MtCO2e) of the UK's total GHG emissions with commercial sector buildings responsible for approximately 10% of overall emissions alone[14]. This is three times greater than emissions from public-sector buildings. Emissions from buildings across all sectors increased by 10% in 2012, with commercial buildings themselves emitting 9% more emissions than in 2011[15]. Figure 2 shows the breakdown of emissions by source and underlines the need to concentrate efforts on improving buildings' energy efficiency as emissions from buildings were above the trajectory required by the CCC to meet future carbon budgets[16].

Moreover, grid-related electricity emissions from commercial buildings contributed 7% of total UK emissions, translating into nearly 70% of emissions from commercial buildings coming from electricity usage[17]. This emphasises the need for commercial building retrofit to be heavily focused upon reducing electricity consumption and is discussed further below.

In its 2013 Progress Report the CCC stated that, *Progress was very limited… notably… energy efficiency improvement in commercial and industrial sectors*[18]. Policy-makers therefore have a significant task ahead in respect to incentivising take up of energy efficiency in the UK's commercial buildings.

12 HM Government (2008) 'Climate Change Act 2008'
13 Department of Energy and Climate Change (2011) 'The Carbon Plan: Delivering our low carbon future', p. 3
14 Committee on Climate Change (2013) 'Meeting Carbon Budgets – 2013 Progress Report to Parliament'
15 Ibid, p. 30
16 Ibid, p. 112
17 Ibid
18 Ibid, p. 11

Figure 2: Greenhouse gas emissions from the commercial sector



DATA

Total Value:	**570MtCO$_2$e**
Other sectors (power, transport, industry, etc.):	359.1MtCO$_2$e 63%
Residential buildings:	136.8MtCO$_2$e 24%
Commercial buildings:	57MtCO$_2$e 10%
Public buildings:	17.1MtCO$_2$e 3%

Source: Commitee on Climate Change (2013) 'Meeting Carbon Budgets - 2013 Progress Report to Parliament'

2.1.3 The benefits of energy efficiency to energy security and the wider economy

For the Government, increased take up of energy efficiency also contributes to national energy security at a time when fears of the UK's increased exposure to oil price shocks are becoming more pronounced.

The Low Carbon Innovation Coordination Group (LCICG) has recently highlighted export opportunities for low carbon goods and services. The LCICG predicts that the global market for innovative products in the low carbon sector, such as low carbon design services and low carbon materials and components, is set to be worth approximately £488 billion by 2050[19]. The export of such products and services would provide an additional value to the UK economy of around £1.7 billion. This market would be stimulated by wide scale investment in energy efficient buildings in the commercial sector. It is also estimated that 136,000 people are currently employed across the UK energy efficiency market, worth around £17.6 billion[20], and this is set to increase if the market can be grown successfully.

19 Low Carbon Innovation Coordination Group (2012) 'Technology Innovation Needs Assessment (TINA): Non-Domestic Buildings – Summary Report'
20 Department for Business, Innovation and Skills (2012) 'Low Carbon Environmental Goods and Services (LCEGS)'

2.2 The threat to business profitability

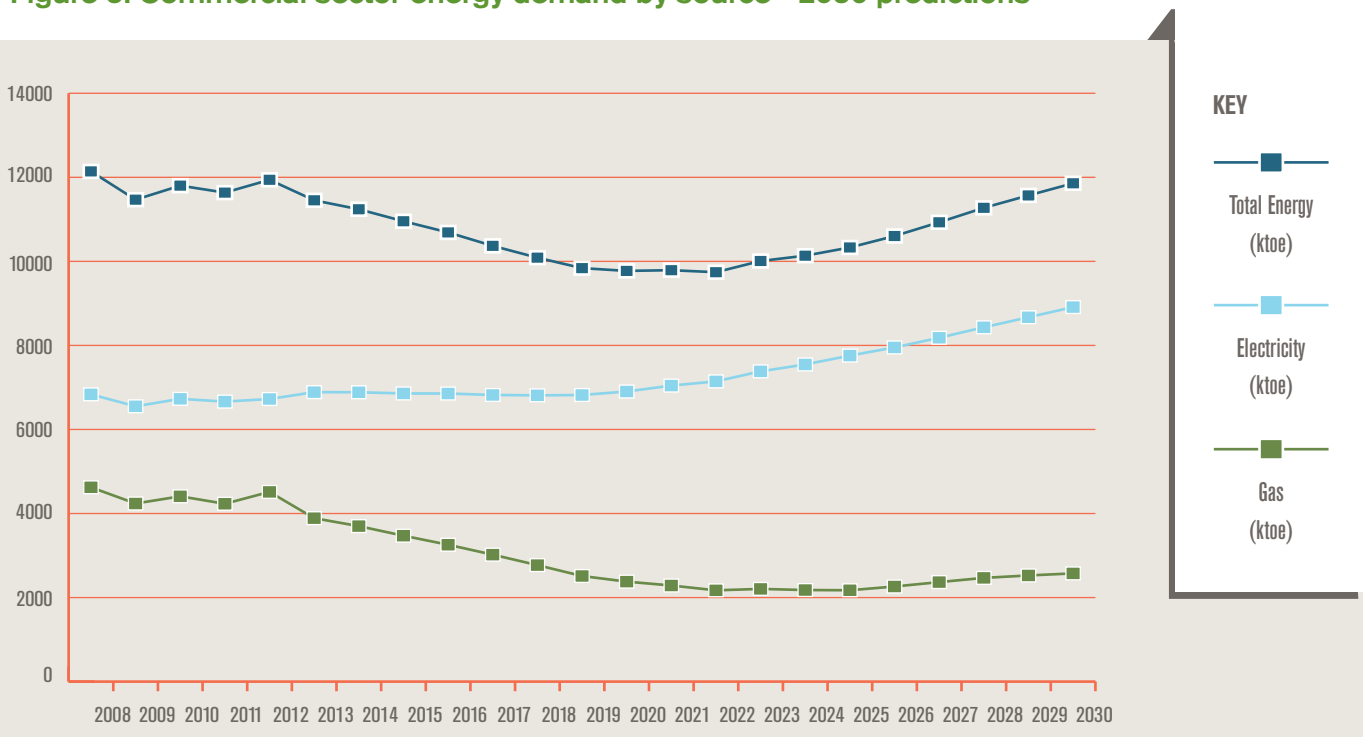
Failing to invest in energy efficiency poses a threat to business profitability. Reasons for this include the large reliance of the commercial sector on electricity as its main source of energy and the increased level of regulation on the commercial sector to reduce its carbon footprint. These are explored in more detail below.

2.2.1 An increasing reliance on electricity

As displayed on the graph in Figure 3[21, 22], the commercial sector's use of electricity significantly outweighs that of other sources of energy, namely gas. Electricity demand is set to increase in the commercial sector by 29.5% (from 6885 to 8912 ktoe[23]/yr) between 2014-2030, as 'electrification' of the commercial sector is predicted to continue[24]. For example, DECC estimates that 40% of commercial floor space will be electrically air-conditioned by 2020 compared to 10% in 1990[25]. In contrast, demand for gas usage is predicted to decrease by 43% between 2014-2030 (from 3700 to 2575 ktoe/yr).

Overall, these figures suggest that the commercial sector as a whole will become increasingly reliant upon electricity as demand for electricity increases up to 2030 and demand for other energy sources falls.

Figure 3: Commercial sector energy demand by source - 2030 predictions



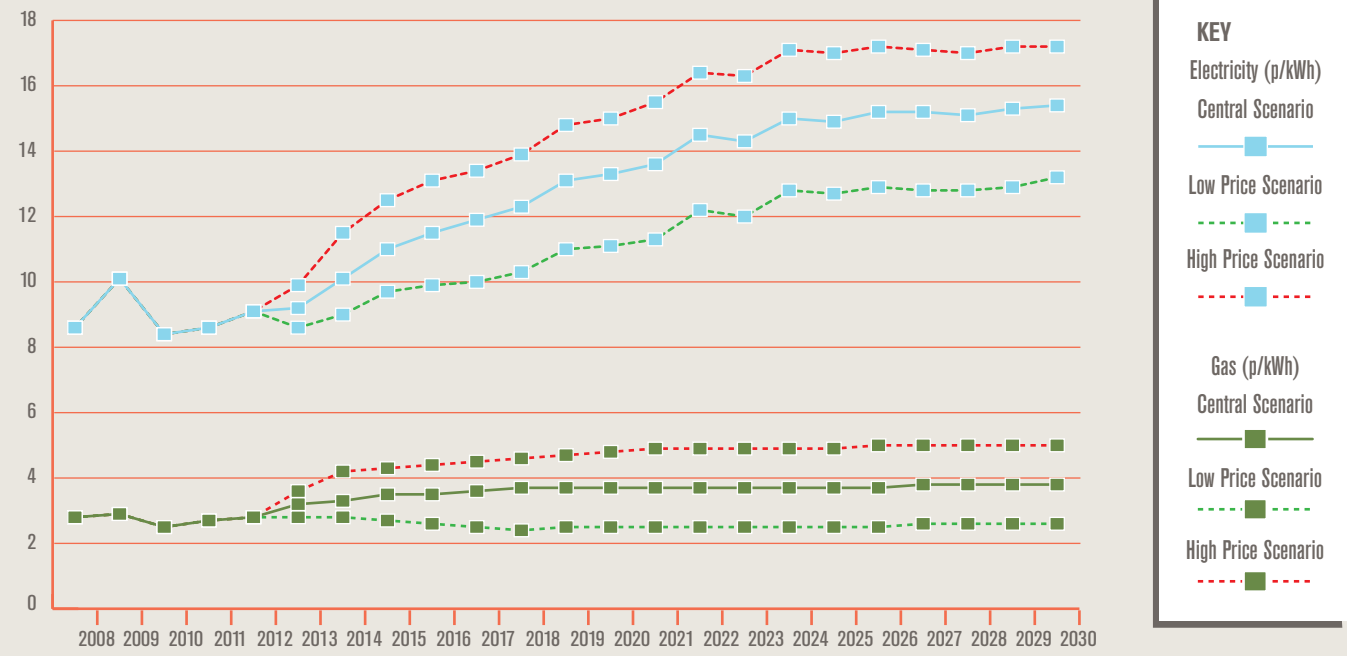
Source: Department of Energy and Climate Change (2013) 'Updated Energy and Emissions Projections 2013'

21 Adapted from: Department of Energy and Climate Change (2013) 'Updated Energy & Emissions Projections'
22 Predictions are based on DECC's 'central estimates' of growth and fossil fuel prices and account for all agreed policies where decisions on policy design are sufficiently advanced to allow robust estimates of impact, for example: Green Deal, products policy, etc.
23 'Kilotonnes of oil equivalent'
24 Department of Energy and Climate Change (2010) '2050 Pathways Analysis'
25 Department of Energy and Climate Change (2013) 'The Future of Heating: Meeting the challenge'

2.2.2 Future energy price growth

Figure 4 shows that the overall trend is for both electricity and gas prices to increase for the services sector (and by definition commercial sector) over the period 2014-2030 with electricity prices experiencing a sharp increase in comparison with gas. Overall these trends underline the fact that retail energy prices are strongly predicted to rise for the commercial sector.

Figure 4: Retail electricity and gas prices for the services sector - 2030 predictions



Source: Department of Energy and Climate Change (2013) 'Updated Energy and Emissions Projections 2013'

As has been illustrated by Figures 3 and 4, a combination of increasing energy demand in the long-term, with the commercial sector's increasing reliance on electricity as its main source of energy means that the economic case is therefore extremely strong for sector-wide investment in energy efficiency measures. This will mitigate the risk of increasing energy bills over the next 17 years.

Some of the largest organisations in the commercial sector are alive to this risk as highlighted by a survey of Chief Financial Officers (CFOs) from companies with greater than $1 billion in revenue each. The survey found that 22% said energy prices represented the most significant source of risk to their firm's future financial performance[26]. Despite this, energy prices will not necessarily become significant enough to induce wide-scale behaviour change alone, outside of the world's largest corporations.

2.2.3 Future policy impacts on businesses' energy bills and prices

Businesses in the commercial sector also face impacts upon their energy bills as a result of the UK Government's domestic energy and climate change policies.

The cumulative impact of these policies will place a financial burden on the commercial sector as illustrated in Figure 5[27]. However, DECC's energy efficiency policies such as the Carbon Reduction Commitment Energy Efficiency Scheme (CRC) – a financial penalty for organisational electricity use exceeding 6,000 MWh per year – are expected to reduce bills for businesses they apply to. This benefit is however expected to be offset by the costs of other climate policies and effects of wholesale energy prices.

It is important to note that in calculating the cost of these policies, DECC has made assumptions of policy take up that are potentially over-optimistic and the cause of much debate. For example, DECC has predicted that the CRC will reduce electricity and gas bills for medium-sized businesses by £100,000 and £60,000 respectively by 2030[28].

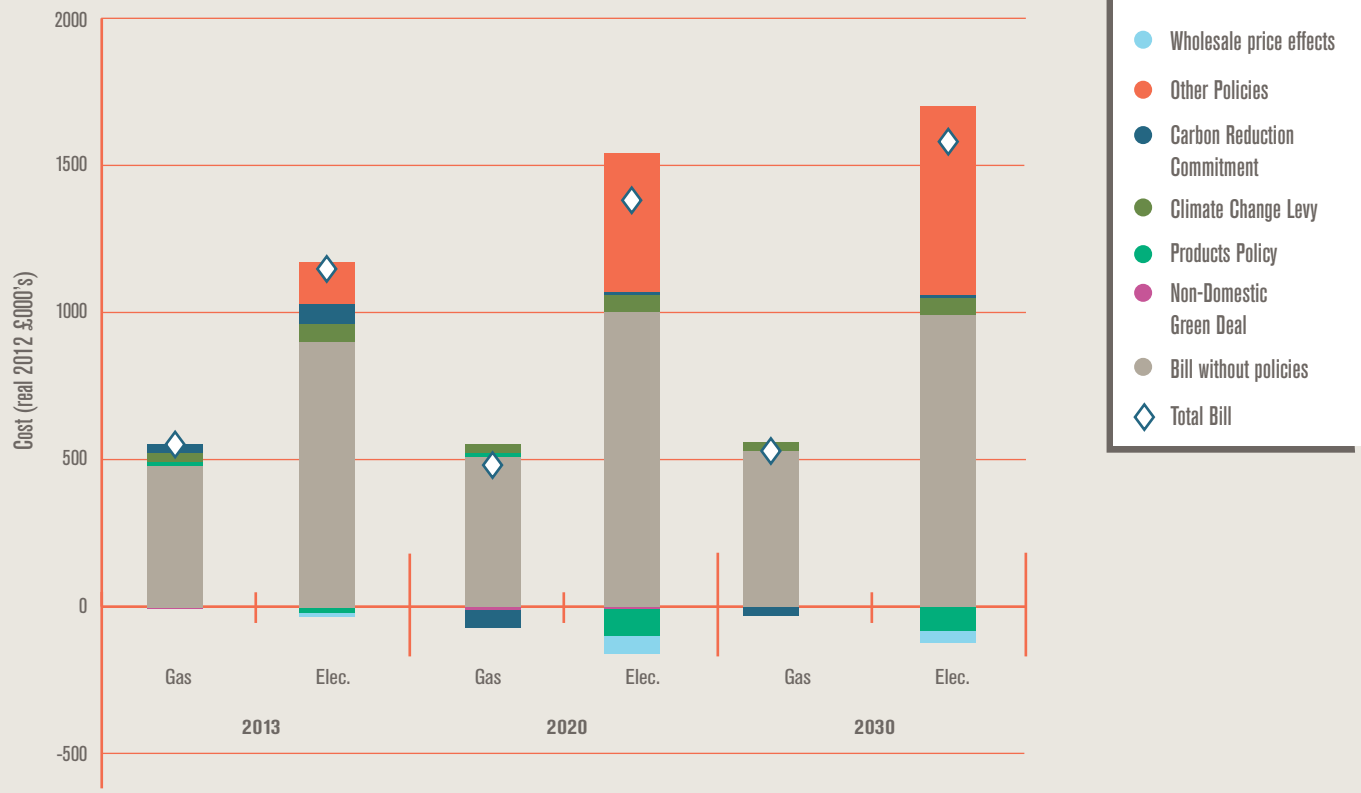
Despite optimistic predictions of energy efficiency policy take up by DECC, there is a strong business case for mitigating the costs of these Government climate change policies by businesses investing in energy efficiency. This is supported by a Carbon Trust report that concluded that UK businesses are missing out on an opportunity to make collective cost-savings of up to £1.6 billion through investment in energy efficiency[29]. Equally, DECC found that commercial sector-wide electricity savings from energy efficiency retrofit (including insulation, heating, lighting and products and appliances) could total 18.9 TWh by 2030[30]. However, DECC has stated that this is a conservative estimate[31] and therefore the potential for energy savings may be greater than this.

It is clear that investment in energy efficiency provides a significant tool for businesses to make the most of an opportunity to protect themselves from future increases in energy demand, price volatility, regulatory compliance costs and ultimately maintaining competitiveness on operating margins with rivals.

26 Deloitte Global Services Ltd. (2012) 'Sustainability: CFOs are coming to the table'
27 'Other Policies' include: the EU Emissions Trading Scheme; Carbon Price Floor; Renewables Obligation; small-scale Feed-In-Tariffs; and Electricity Market Reform policies
28 Department of Energy and Climate Change (2013) 'Estimated impacts of energy and climate change policies on energy prices and bills', p. 85
29 Carbon Trust Advisory Services (2010) 'The Business of Energy Efficiency' [Evidence was gathered from over 1000 Carbon Trust clients' energy efficiency projects as part of a 2010 survey of Chief Financial Officers]
30 Department of Energy and Climate Change (2013) 'Electricity Demand Reduction – Amendment to Capacity Market Clauses'
31 Ibid, p. 10

Figure 5: Estimated impact of policies on business energy bills

CRC Participant



Source: Department of Energy and Climate Change (2013) 'Estimated impacts of energy and climate change policies on energy prices and bills'

Non-CRC Participant

Source: Department of Energy and Climate Change (2013) 'Estimated impacts of energy and climate change policies on energy prices and bills'

2.2.4 The 'softer' benefits of energy efficiency

There is also a body of evidence suggesting a number of less visible benefits afforded by investment in energy efficiency, such as improved productivity, that can help businesses maintain their international competitiveness. The Westminster Sustainable Business Forum (WSBF), in a previous report, identified £8 billion in savings in the public sector from a 5% increase in productivity due to more energy efficient buildings and it is not unreasonable to expect similar results in the commercial sector[32].

The aesthetic benefits of particular energy efficiency technologies also appear to aid the take up of such technologies. For example, lighting is particularly attractive to many businesses, due to lower upfront costs, but also as there are now a number of lighting options available for businesses to tailor to their specific needs. In contrast, as discussed, levels of Heating, Ventilation and Air Conditioning (HVAC) take up have been considerably lower and this may be in-part due to the lack of visible aesthetic benefit afforded by upgrading HVAC systems.

Some commentators still question the significance of so-called 'soft' benefits to the business case for investment in the energy efficiency of buildings. However, maintaining and improving the health and productivity of staff is a top priority for many organisations. Research suggests that better designed work spaces with access to natural daylight can improve key staff utilities, such as mental function and memory, by up to 25%. Equally, improved environmental systems, such as better temperature control and ventilation, can increase worker productivity by 11% and 3% respectively[33].

Whilst the World Green Building Council has identified a need for further research, in order to make a more credible business case for energy efficiency investments on these grounds alone, the Derwent London case study overleaf demonstrates that it is possible to design a highly energy efficient, and aesthetically pleasing building, that can boost workplace productivity.

Overall the commercial sector has much to gain from increasing its energy efficiency and making better buildings for its staff to work in.

32 The Westminster Sustainable Business Forum (2011) 'Leaner and Greener II: Putting buildings to work'
33 World Green Building Council (2013) 'The Business Case for Green Building: A Review of the Costs and Benefits for Developers, Investors and Occupants'

THE 'ANGEL' BUILDING

CASE STUDY
DERWENT LONDON SUSTAINABILITY

Design-Led Ethos and Sustainability

Derwent London is a property investor and developer which owns a portfolio of 5.4 million square feet located mainly in central London, making it the largest London-focused real estate investment trust[34]. The ethos at Derwent London is strongly 'design-led' and their business model is to create unique, high quality commercial office space from often older industrial buildings. Sustainability is at the core of Derwent London's business model. This has arisen through practical experience, an understanding of refurbishing older buildings and recognising that good design can realise not only aesthetic benefits and energy efficiency improvements but also occupant benefits. These include higher levels of well-being and productivity through greater access to natural light and natural ventilation.

Derwent London has found that tenants are becoming more focused on attracting and retaining a high performing workforce. In particular, organisations in the technology, media and telecommunications sector, which have experienced rapid growth in the UK's 'high-tech' economy, are increasingly looking at buildings as a way of helping them attract and retain the best talent in the market. Equally, an office environment which maximises worker productivity is seen as vital by many of Derwent London's tenants. In the context of sustainability this goes beyond simply reducing utilities costs (which are relatively small when compared to staff costs) and instead encompasses less tangible benefits such as the value of access to natural light, and natural ventilation, which are key components to increased levels of occupant satisfaction and well-being.

The company has responded to this demand through experienced in-house building management teams, occupier engagement programmes and a focus on easy-to-use efficiency technologies such as smart building controls. A good example of this is in the 'White Collar Factory', which will use a simple application that will inform individual users on how to heat or cool their immediate working area by making recommendations as to when to open and close nearby windows and accompanying blinds. This thereby gives the user the ability to control their space more effectively.

The 'Angel Building'

Amongst Derwent London's portfolio is the 'Angel Building'. The building itself, formally known as the Angel Centre and covering 162,000 square feet, was built in the 1980s and underwent a complete refurbishment, both inside and out, with installed features including more efficient lift systems, a displacement ventilation air system and a new double-glazed envelope combined with solar shading.

Furthermore, Derwent London's drive for occupier engagement through innovative design and focusing on the wider benefits afforded by sustainability improvements has yielded positive results in terms of occupier satisfaction. A post-completion socio-economic assessment commissioned by the company found that employees felt 50% more engaged and positive and enjoyed work relationships 20-25% more than in their previous buildings. Moreover, the same report found that these same employees spend on average £620 per year in the immediate area around the building (thought to translate into a 19% increase in revenue to local businesses), strengthening and enhancing the local economy[35].

Overall the attention to promoting the wider socio-economic benefits of sustainable retrofits is proving highly successful for Derwent London. Moreover, it provides evidence that such factors should be taken into account when valuing property in the future.

34 Derwent London (2012) 'Derwent London plc – Report & Accounts 2012'
35 Ibid

3 UNDERSTANDING THE RISKS AND BARRIERS FOR ENERGY EFFICIENCY INVESTMENT

3.1 The risk of not investing in energy efficiency

Section 2 has set out the case for investment in energy efficiency in the commercial sector. This is particularly within the context of the increasing risk posed by climate change, meeting regulatory targets to reduce carbon emissions and the predicted increasing costs of energy.

Figure 6 illustrates the current level of perceived risk in terms of cost, regulatory and reputational risk that not increasing energy efficiency poses for organisations of differing sizes in the commercial sector. It shows that the full extent of the risks of not investing in energy efficiency are not always being fully realised by the commercial sector. The size of an organisation also affects the real and perceived size of the risk of not investing in energy efficiency. For example, whilst regulatory and reputational risks tend to affect larger organisations more than SMEs and micro-businesses, smaller organisations are more likely to be affected by the risk of increasing costs of energy. This is because energy consumption is likely to make up a larger proportion of the costs of running their business.

Further evidence from the British Chambers of Commerce (BCC) shows that businesses overall do not typically link business growth (or a lack of it) to costs arising from energy usage. Only half of BCC members agreed that energy costs had adversely impacted upon business growth and a significant proportion (38%) disagreed with this proposition[36].

3.2 Barriers to take up of energy efficiency in the commercial sector

This inquiry also found that businesses are failing to fully recognise the 'strategic value' of energy efficiency and that there are a number of internal barriers to take up that must be overcome.

3.2.1 Meeting strategic business goals and aims

60% of members of the Federation of Small Businesses (FSB) recently said they are targeting growth for the next 12 months[37]. Energy efficiency investments can contribute to the growth of a business. The Carbon Trust has suggested that many energy efficiency investments offer incredibly attractive Internal Rates of Return (IRR), with rates of 48% on offer for medium-sized businesses looking to reduce their energy bills by 15%[38].

This inquiry found however, that whilst energy efficiency opportunities with short, one to three year payback periods were being exploited relatively quickly, few businesses were taking advantage of projects with longer payback periods[39].

36 British Chambers of Commerce (2012) 'The Energy Market: Business requires certainty'
37 Federation of Small Businesses (2012) 'The FSB 'Voice of Small Business' Member Survey'
38 Carbon Trust (2010) 'The Business of Energy Efficiency'
39 Ibid, p. 2

Figure 6: Understanding the current energy efficiency investment risk landscape

Business size	Risk type		
	Cost	Regulatory	Reputational
Large Enterprises	- Energy costs form a small part of overall operating budgets particularly when compared to staffing and rental costs[40].	- CRC Energy Efficiency Scheme targets 'electro-intensive'[41] users with financial penalty[42]. - Majority of CRC participants consider CRC a 'tax on business' and simply absorb compliance costs into operating budgets[43]. - Many businesses have reported that measures implemented to comply with CRC would have been put in place regardless[44].	- Maintaining a positive 'brand image' is very important, especially if primarily public customers. - Public and shareholder importance of sustainability reflected by implementation of carbon reporting regulations in October 2013 for listed companies[45]. - Removal of CRC Performance League Table has removed reputational driver from CRC scheme.
Small and Medium-Sized Enterprises (SMEs)	- Particularly sensitive to increases in utilities costs. - Only small proportion (approximately 25%) sees energy management and reducing energy consumption as 'very important'[46].	- Large variance in SME energy-use and behaviour and awareness levels makes it very difficult to use universal regulatory drivers.	- Maintaining a positive brand image is generally less important for SMEs unless public-facing. - Some SME suppliers see reputation as important for winning contracts as influence spreads downwards through supply chains e.g. Carbon Trust's work with Tesco to engage closely with the warehousing supplier to reduce energy costs through lighting upgrades[47].
Micro-businesses (<10 employees)	- Exhibit considerable variation in awareness of energy costs similar to domestic consumers e.g. some struggle to locate energy meters. - Other micro-businesses behave as 'first-movers' and monitor energy usage closely and are highly proactive.	- Micro-business community feel that current policies tend to focus on larger companies. - 75% of Forum of Private Business 'Environmental Panel' members agreed that, *"environmental legislation is focused on larger business and their needs"* [48].	

40 Department of Energy and Climate Change (2013) 'Estimated impacts of energy and climate change policies on energy prices and bills'
41 Defined by DECC as organisations using more than 6,000 MWh of electricity per year
42 Environment Agency (2013) 'CRC Energy Efficiency Scheme guidance for participants in Phase 1 (2010-2011 to 2013-2014) – Version 2.1'
43 Confederation of British Industry (2013) 'Replacing the CRC with effective business energy efficiency policy: CBI response to the DECC consultation on a simplified CRC energy efficiency scheme'
44 BusinessGreen (2012) 'BusinessGreen White Paper: What next for the Carbon Reduction Commitment – An analysis of perceptions towards the CRC and its impacts'
45 S. 414C - Companies Act 2006 (Strategic Report and Directors' Report) Regulations 2013
46 npower (2013) 'Business Energy Index 2013', p. 9
47 Press release available at: http://www.carbontrust.com/news/2013/09/carbon-trust-helps-tesco-suppliers-unlock-energy-efficiency-savings-with-buying-club
48 Forum of Private Business (2011) 'Environmental Panel Report'

This suggests that the 'profitability' of business investments is not the only factor determining which investments go ahead. Investments will also carry greater weight in the minds of company budget-holders and decision-makers if they closely align with a company's strategic goals and aims, whether internal or publicly-stated[49].

3.2.2 A lack of skills and understanding

Even where the business case for energy efficiency is understood, many businesses do not have the in-house skills or experience to carry out energy efficiency projects and must outsource some or all of the project development and implementation to contractors. This is particularly the case with smaller businesses, such as micro-businesses, which cannot afford to hire staff with the required skills to collect and interpret data on energy usage and generate solutions accordingly. These organisations are often more 'time-poor' than larger businesses and have limited resources for the consideration of installing energy efficiency improvements.

3.2.3 A breakdown in communication

Whilst small businesses in particular suffer from a lack of in-house skills and knowledge to fully value energy efficiency, large businesses often lack the internal communication network to link different departments together to implement an energy efficiency project effectively. Communication across departments is crucial as energy efficiency projects typically require the involvement of multiple stakeholders. For example, an estates department, valuing energy efficiency for the reduction in utilities costs, may need to gain approval from the finance department which is likely to be more interested in reducing the indebtedness of the business, something that could be threatened by investment in energy efficiency.

Furthermore, poor lines of internal communication can increase many businesses' perceptions of the 'hidden' costs associated with such investments. For example, less tangible 'hassle costs' such as disruption to business activity, can end up being exaggerated through replication by disconnected departments considering energy efficiency investments in isolation. This can prevent approval of decisions to invest in energy efficiency[50].

This inquiry also heard that suppliers in the energy efficiency market have struggled to engage with clients in the commercial sector. This is further impacted by the skills and knowledge-gap identified above and the effect this has on the efficacy of internal procurement processes within many businesses. For example, many suppliers of novel, yet proven, energy efficiency technologies are prevented from accessing the 'trusted suppliers' lists used by many procurement teams within larger businesses. This constrains the growth of the energy efficiency market generally. Equally, this lack of consumer knowledge of the energy efficiency market has created an atmosphere of mistrust amongst many commercial-sector customers of energy efficiency suppliers and advisers.

49 Cooremans (2012) 'Investment in energy efficiency: Do the characteristics of investments matter?' Energy Efficiency Vol. 5, pp. 497-518
50 Department of Energy and Climate Change (2012) 'What are the factors influencing energy behaviours and decision-making in the non-domestic sector? A Rapid Evidence Assessment'

Regrettably, a lack of ability on the part of suppliers to fully prove their products and services, and provide certainty of the predicted savings available to customers, has further fed this pervasion of mistrust in the energy efficiency market. The lack of confidence has been further eroded by the increasing number of third party financiers now requiring more rigorous 'investment-grade' audits before funding energy efficiency projects in the commercial sector, particularly for large commercially-owned properties.

3.3 Solutions: Engaging senior executives

Strong leadership, through senior executive buy-in within businesses is required to drive through project approval, oversee implementation and ultimately recognise the long-term value that investment in energy efficiency offers. For energy efficiency projects to be successful they need the direct involvement of senior executives within a business, such as a leading Board Member, Chief Executive Officer or Financial Director. This is reflected in the shift for sustainability authority in large businesses worldwide to be transferred to Chief Financial Officers (CFOs) from lower-level sustainability managers[51].

Furthermore, as Carbon Connect has previously identified, establishing a clear return on investment for energy efficiency is crucial for approval of finance for such investments at board level[52]. Therefore it is the CFOs of businesses who will be increasingly looked to for leadership in making the business case for energy efficiency investments.

The need for internal leadership from senior business executives also revolves around their ability to affect a deeper cultural change within an organisation centred around energy efficiency and through being in a position where they can knit together different teams, with varying objectives, from across the internal structure of a business[53]. This is required for an organisation to fully accept, and recognise the strategic importance of investment in energy efficiency across an entire organisation in order to stimulate behaviour change.

As discussed below, the Government's Energy Saving Opportunity Scheme (ESOS) has the potential to engage with senior executives within large businesses on the importance of energy efficiency. It is crucial that this scheme contains provision for executive-level approval of ESOS assessments to achieve this level of buy-in and help channel energy efficiency information from a lower or middle manager level to the executive level within participating businesses.

51 Deloitte Global Services Ltd. (2012) 'CFOs are coming to the table', p.5
52 Carbon Connect (2011) 'Energy Efficiency - The Untapped Business Opportunity'
53 Lavery/Pennell (2013) 'The Next Manufacturing Revolution'

3.3.1 The Energy Savings Opportunity Scheme (ESOS)

The recent proposal of implementing the EU Energy Efficiency Directive (EED) through the 'Energy Savings Opportunity Scheme' (ESOS), detailed in Figure 7 below, is designed to raise awareness of organisational energy usage through the mandation of energy assessments for large businesses.

Figure 7: The Energy Savings Opportunity Scheme (ESOS)

The Energy Savings Opportunity Scheme (ESOS) is a policy currently being proposed by the Department of Energy and Climate Change (DECC) to implement Article 8 of the EU Energy Efficiency Directive (EED). This states that, *Member States shall ensure that enterprises that are not SMEs are subject to an energy audit* [54]. This includes compliance from businesses with more than 250 persons and either an annual turnover exceeding €50 million, or a balance sheet exceeding €43 million.

The scheme is designed to raise awareness of energy costs amongst the business community. DECC's own impact assessment suggests that the potential net benefit of this policy to the UK is between £0.8 billion and £3 billion with an average of a 0.7% energy saving per enterprise taking part in the scheme[55].

Whilst the responses to a public consultation on the scheme are currently being analysed, it has been made clear in the consultation document that the scheme will require 'appropriately qualified or accredited' assessors to conduct energy assessments that provide 'minimum information'[56]. This includes a review of the total energy use and energy efficiency of the organisation, clear information on potential savings, recommendations of cost-effective measures, and a report to the scheme's Administrator.

The Government consultation explicitly states that the scheme avoids 'gold-plating' of the EU Directive and as a result will only include large enterprises, with SMEs simply being 'encouraged' to undertake an energy assessment through existing schemes such as the Green Deal.

The ESOS scheme should help to raise awareness of the business case of investing in the energy performance of buildings in the commercial sector. However, this inquiry did encounter strong concerns about the ability of the ESOS to fulfil this potential in its current proposed form.

Firstly, there are concerns that the methodology, which ESOS assessors would be expected to use when carrying out assessments, will not be robust enough to provide meaningful information for businesses being audited. For example, there are no plans to use benchmarking in current Government proposals for the scheme. The inquiry found that this is due to a severe lack of data available for typical energy use in commercial buildings. The Department of Energy and Climate Change (DECC) has also identified a lack of sector-specific data as a significant issue for evidence-based policy

54 Article 8(4) of 'Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency'
55 Department of Energy and Climate Change (2013) 'Energy Savings Opportunity Scheme (ESOS) – Impact Assessment'
56 Department of Energy and Climate Change (2013) 'Consultation on implementation of Article 8 of the European Union Energy Efficiency Directive ('energy audits')'

making and has begun work to combine the Non-Domestic Energy and Emissions Model (N-DEEM), which provides the Government's current evidence base for policy making, with the National Energy Efficiency Database (NEED)[57]. In addition, DECC recently published a pilot energy efficiency study into the Food and Mixed Retail (FMR) sector[58] and, whilst there are plans to repeat this for other sectors, this inquiry found it is vital that characteristics of differently-sized businesses are also taken into account in each study.

The 'CarbonBuzz' website[59] currently provides an online platform for benchmarking and tracking energy use in retrofit projects, from design to operation. The Government could investigate the use of such a model of industry collaboration in order to better engage with the commercial sector on encouraging further provision of building energy data. Having such data available would make it easier to roll-out benchmarking for energy efficiency policies and should encourage 'beyond compliance' take up of energy efficiency measures in the commercial sector.

Recommendation 1

The Government should compile a comprehensive database for the energy performance of UK commercial buildings. This would be facilitated by working initially with the commercial property industry.

Secondly, the inquiry found that in its currently proposed form, the scheme would not sufficiently raise awareness of energy costs and energy efficiency at an executive level within a business complying with the scheme. The scheme should therefore include a requirement for senior executive sign-off on an ESOS Assessor's report. As discussed above, this is crucial in order to obtain buy-in for energy efficiency measures from executive officers within a company's structure and to push through deep cultural changes that will need to take place as part of a typical energy efficiency project.

There is also currently no provision that companies undertaking an ESOS Assessment should take up the measures recommended to them by an Assessor. The Government should introduce a requirement into the 'Good Practice Guide' for companies complying with the ESOS to provide some form of reasoning for not acting upon previous ESOS recommendations. This would both help a future Assessor in making 'cost-effective' recommendations and provide a track record of inaction as evidence for future senior executives within a business to act upon.

Recommendation 2

The Government should require that the ESOS Assessor's final report obtain sign-off by a senior executive such as the Chief Financial Officer, or Managing Director, within a qualifying organisation, before deemed to meet the ESOS requirements.

57 Department of Energy and Climate Change (2013) 'Energy use in non-domestic buildings: the UK government's new evidence base'
58 Department of Energy and Climate Change (2013) 'DECC Non-domestic building energy use project phase I: Pilot study of the food and mixed retail sector'
59 Available at: http://www.carbonbuzz.org/ [Accessed 15 October 2013]

4 CENTRAL AND LOCAL GOVERNMENT'S ROLE IN STIMULATING COMMERCIAL SECTOR ENERGY EFFICIENCY

Raising awareness of Government schemes to encourage take up of energy efficiency measures in the commercial sector is necessary. For example, one scheme that is relatively well-known by energy efficiency suppliers, but less well by consumers in the commercial sector, is the Enhanced Capital Allowance (ECA) scheme managed by the Carbon Trust on behalf of the Department of Energy and Climate Change (DECC). The scheme, fully outlined in Figure 9 in Section 5.2 enables businesses to offset some of the capital costs of investing in energy efficiency by gaining tax relief on energy efficiency products. However, it needs to be much better communicated to the commercial sector by Government and this could be partly achieved by creating an energy efficiency 'hub' website outlining the various Government-backed energy efficiency schemes including the non-domestic Green Deal.

4.1 The Green Deal

The non-domestic Green Deal scheme is 'open for business'. However, only the domestic side of the scheme has seen significant publicity and public engagement. This is highlighted by only 11% of occupier-respondents to a joint-survey conducted by the Westminster Sustainable Business Forum, Carbon Connect, and Centurion Properties, being aware of the Green Deal[60]. The inquiry found that this has created uncertainty amongst many organisations in the non-domestic sector as to whether the non-domestic Green Deal is worth spending resources on and has fed strong suspicions that the scheme is too risky to be worth investing in.

Information on the non-domestic Green Deal is also widely regarded as being difficult to access. This is particularly the case for smaller businesses which are often 'time-poor' and lack the resources necessary to fully assess the scheme's applicability to their organisation.

The Government should visibly 're-launch' the non-domestic Green Deal as soon as possible, to boost confidence in the scheme. Given Government spending, from April to July 2011, of £3.74 million on marketing the domestic Green Deal[61], a similar sized marketing spend should be earmarked for the non-domestic scheme. Furthermore,

60 This survey was carried out between 17 October and 6 November 2013 and involved a small number of representative occupiers renting space from Centurion Properties
61 Department of Energy and Climate Change (2013) 'Green Deal FOI Request: 15th August 2013'

promotional activity should aim to reach the business community through use of both a national advertising campaign and sector-specific work. This can be achieved through Government partnerships with relevant trade industry bodies in order to tailor information to different business audiences.

Equally, although information is made available through DECC's website on the Green Deal this is often highly fragmented and difficult for organisations to understand. For example, information on the Green Deal process for businesses to follow is held on a DECC webpage that is wholly separate from the Green Deal Oversight Registration Body (ORB) detailing information on Green Deal Advisors, Providers, Installers, and Certification Bodies. Therefore simplifying the Green Deal message and making the information available to non-domestic consumers from a single online resource should be a priority. This website could be a subsection of the proposed energy efficiency 'hub' website outlined above.

Recommendation 3

The Government should use a national advertising and sector-specific marketing campaign, to re-launch the non-domestic Green Deal scheme. This should be supported by a 'hub' website, hosted by DECC, with easy-to-follow guidance on all non-domestic energy efficiency schemes.

4.1.1 Utilising Local Authority networks

Having originally launched the £10 million 'Green Deal Pioneer Places fund' for Local Authorities to kick-start the Green Deal in their local area[62], weaknesses have been identified in the domestic Green Deal scheme's original strategy for roll-out. DECC has now launched the 'Green Deal Communities Scheme' which aims to help Local Authorities boost take up of the domestic Green Deal on a 'street-by-street' basis[63]. Local Authorities should be able to significantly raise the visibility of the Green Deal in their local areas through this new method of roll-out.

In order to replicate this approach for the non-domestic Green Deal, Local Authorities would either need extra funding from DECC or be able to access further borrowed finance through a one-off short-term raise of the Local Authority borrowing cap. The identification of property owners, rather than lease holders, will be crucial for Local Authorities to engage with the necessary stakeholders for the successful roll-out of a street-by-street promotion of the non-domestic Green Deal.

Recommendation 4

The Department of Energy and Climate Change should work with HM Treasury to secure funding to support a targeted 'street-by-street' promotion of the non-domestic Green Deal, to increase awareness and take up.

62 Department of Energy and Climate Change (2011) 'DECC Local Authority Funds: DECC Local Authority Competition 2012-13'
63 Department of Energy and Climate Change (2013) 'Press Release: £20m to help local communities benefit from Green Deal'. Available at https://www.gov.uk/government/news/20m-to-help-local-communities-benefit-from-green-deal [Accessed 7 August 2013]

As described in the 'Cambridge Retrofit' case study below, a community-focused approach involving Local Authorities has the potential to be highly successful. 'Cambridge Retrofit' draws upon the strength of local networks to directly link local suppliers and business customers. The project's model for engagement makes use of the trust and credibility of local suppliers in the minds of local businesses which should help ensure strong take up of energy efficiency measures over the next 30 years. It also provides a strong platform to advertise the benefits of taking part in the scheme to other businesses in the Cambridge area, increasing participation further.

4.2 Local Enterprise Partnerships

The dissolution of Regional Development Agencies (RDAs) and their replacement with 39 Local Enterprise Partnerships (LEPs) in 2011 has altered the way in which Government at both national and local levels interacts with businesses in their local areas. LEPs are locally-owned partnerships between Local Authorities and businesses set-up to determine local economic priorities and undertake activities to drive economic growth and facilitate the creation and retention of local jobs[64]. In this way LEPs can lead local businesses and Government to produce strategies that suit the social and economic characteristics of their local area and disseminate examples of best practice.

The New Anglia LEP, designated as a 'Green Economy Pathfinder', exemplifies this approach through showcasing successful local 'green' business activity such as businesses with particularly energy efficient operations[65]. Following on from the highly successful 'REV ACTIVE' scheme in which specialist business advisors were placed in individual businesses to advise on resource efficiency, the New Anglia LEP is one of several East of England LEPs now providing the 'Grants4Growth' programme, detailed in section 5.2.

Crucially 'Grants4Growth' only provides capital subsidy for businesses with energy efficiency projects that will have proven carbon emissions reductions and will help business growth, safeguarding or creating new jobs through improved efficiency. In so doing, participating LEPs are able to focus on directly communicating the link between investments in energy efficiency and 'growing the business bottom line'. With around £300,000 of support having already been claimed[66], the Government should consider ways of helping this type of scheme to be rolled-out across the UK to further LEPs.

As part of growing LEPs' capacity to guide local economic development, the Government is requiring LEPs to submit Growth Deals. These are business plans where LEPs bid for funds to be allocated from central Government. Guidance on what constitutes a good 'Growth Deal' has already been issued[67] but will be periodically updated and therefore there is an opportunity to emphasise the importance of energy efficiency in future guidance. Central Government should place more weight on energy efficiency proposals as a key determinant on which LEPs will be successful in attracting funding.

64 http://www.lepnetwork.org.uk/the-lep-network.html [Accessed 2 September 2013]
65 Grants4Growth (2013) 'Accessing Funding Showcase Event, 6 November 2013'
66 Grants4Growth (2013) 'Grants4Growth Bulletin – 14 November 2013'
67 Department for Business, Innovation and Skills (2013) 'Growth Deals: Initial Guidance for Local Enterprise Partnerships'

Recommendation 5

The Government should include strong guidance to encourage the inclusion of specific energy efficiency measures in the future Growth Deals to be submitted by LEPs.

4.3 Business Improvement Districts

Business Improvement Districts (BIDs) are funded and established as a partnership between local businesses and councils in local areas[68]. Fundamentally, BIDs are aimed at developing projects and services that will benefit the economic trading area within the boundary of a BID and there are now estimated to be 201 BIDs across the UK.

BIDs are increasingly placing sustainability higher up their agenda. In London, the Smart Green Business Scheme[69], part-funded through the European Regional Development Fund, included free provision of environmental and energy performance audits to SME members of several London-based BIDs and acted as a tool to encourage local businesses to begin getting involved in the active management of their energy and resource-use generally.

BIDs also have the ability to use the aggregate purchasing power of their individual members in negotiating cheaper arrangements for their members such as for energy-supply agreements. This aggregation of purchasing power could be used to help local energy efficiency suppliers achieve economies of scale and to lower the overall costs of taking up energy efficiency in those areas. BIDs therefore have the potential in the future to play a significant role as a vehicle for rolling-out the non-domestic Green Deal to the SME sector.

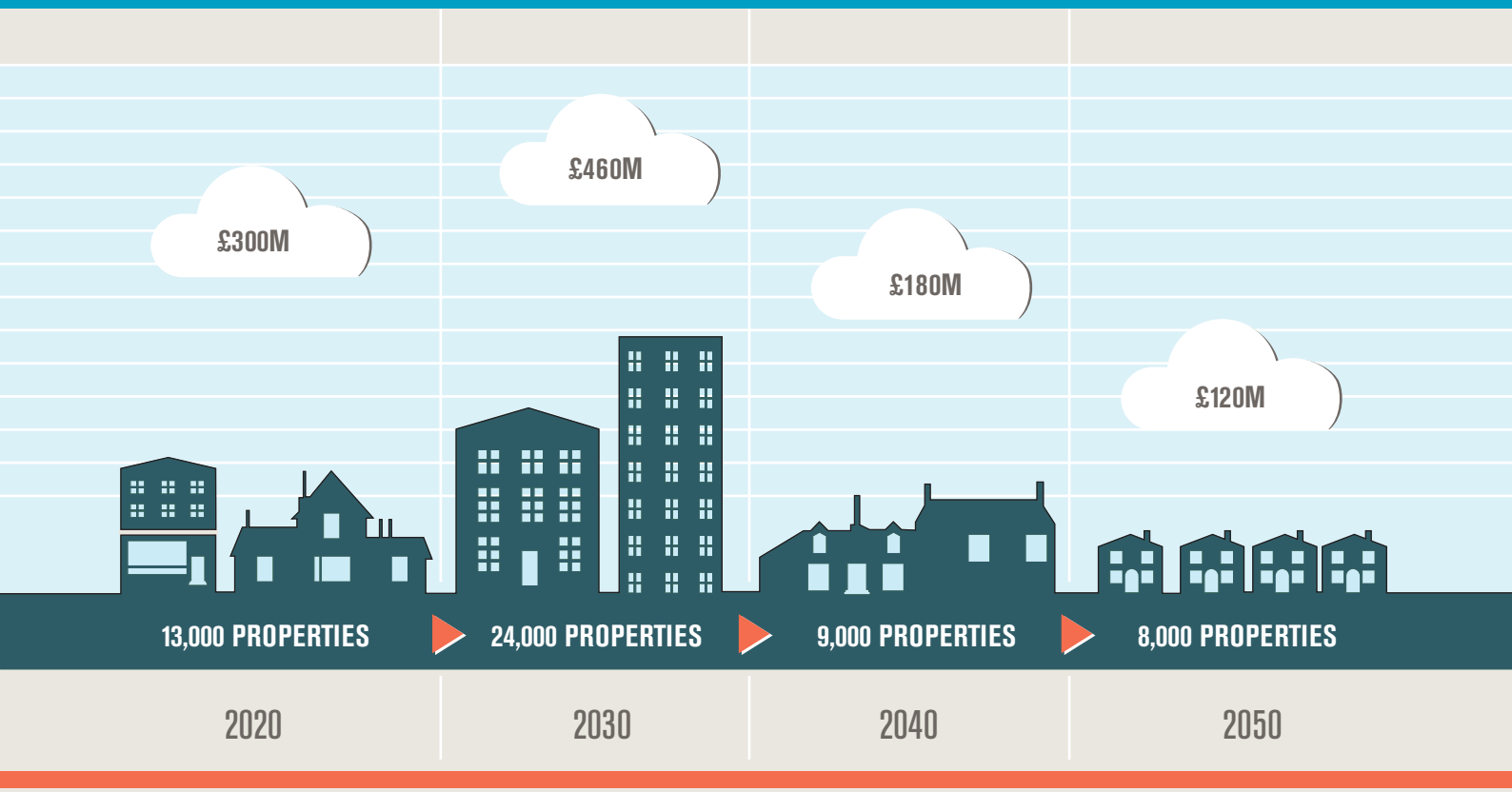
68 House of Commons Library (2013) 'Standard Note – Business Improvement Districts'
69 http://www.smartgreenbusiness.co.uk/ [Accessed 25 June 2013]

THE CAMBRIDGE RETROFIT PROJECT

CASE STUDY

The Project

The Cambridge Retrofit project is a retrofit programme running until 2050, incorporating the city of Cambridge and its outlying villages. The project brings together organisations from across the city's local economy with the overarching aim of helping the UK meet its target for an 80% reduction in CO_2 emissions on 1990 baseline levels by 2050. In order to do this, the project is mobilising the local public and private sectors to retrofit domestic, public and commercial buildings across the city. The project timeline, illustrated below[70], includes aims to retrofit 13,000 buildings by 2020; 24,000 buildings from 2020 to 2030; 9,000 buildings from 2030 to 2040; and 8,000 buildings from 2040 to 2050. In doing so the project hopes to contribute around a third (between 20-30%) of the emissions reductions Cambridge needs to reach its own 80% reduction target by 2050.



Cambridge was chosen to locate the project as major estate holders such as Cambridge City Council and the University of Cambridge have already developed ambitious plans for carbon reduction. Equally, the area has a wide mix of building estates, owned and managed by a relatively small number of institutions. These include Cambridge City Council, the University of Cambridge, estate firms and local schools, making it an ideal city to pilot the model used by Cambridge Retrofit.

70 Available at: http://www.cambridgeretrofit.org/timeline.aspx [Accessed 24 October 2013]

Benefits of the Project

It is often difficult to achieve economies of scale for retrofit as projects are particular to the geographical area and building in which they are being implemented. Individual projects often have high levels of investment risk and therefore significant transaction costs associated with them, resulting in off-putting levels of cost for prospective energy efficiency retrofit customers. The Cambridge Retrofit project aims to counter this trend by generating widespread demand for retrofit at the 'community-scale' and in turn enabling energy efficiency suppliers to achieve economies of scale. This also reduces the risks and lowers the cost of finance for retrofit projects in the Cambridge area.

The Project Model

The Cambridge Retrofit project creates 'Communities of Action' from participants registered via the project's online system. These comprise of local government, businesses, estate managers, home owners, social enterprises, academia and residents' associations. Several member organisations are then chosen to lead each community. For example, RBS leads the 'Finance' community in partnership with KPMG. Lead organisations then help to organise engagement activities, disseminating information about the project and drawing in interested parties. By targeting participants through specialised 'communities' and drawing upon the strength of local connections, external communications can be tailored to different sectors with the messaging outlining benefits beyond simply achieving cost reductions, such as the increased asset value of retrofitted properties.

The networks formed allow participants to be matched with organisations across the retrofit supply chain to help aggregate demand, achieve localised economies of scale through Cambridge Retrofit 'buyers cooperatives' and speed up the retrofit process by issuing targeted alerts to participants for upcoming events and retrofit opportunities. The Cambridge Retrofit project will be measuring its success through fully integrated monitoring of the carbon footprint of both the entire community of buildings as well as the before-and-after values for each individual retrofit. Furthermore, the project will be reporting on its cost-effectiveness, energy bill savings and number of buildings retrofitted as part of the scheme, in order to judge its financial success. At present, this is being carried out through the Department of Land Economy at the University of Cambridge. However, future reporting will be mandated as a part of any retrofit project taking place through Cambridge Retrofit, helping Cambridge to realise its aspiration to be the first fully-monitored city in the UK by 2016.

Success so far

Asda, a major retailer in Cambridge, was an early-mover in retrofits that became involved with the project following its focus on reducing carbon emissions by 20% by 2012 on its 2005 baseline. Through Cambridge Retrofit, Asda was able to obtain a no-cost assessment of retrofit options and their cost effectiveness and has used such knowledge to leverage the expertise of multiple delivery organisations, such as Sigma and Building Automation Solutions for project management and building management respectively, for each aspect of the overall retrofit programme. The resulting programme allowed Asda's estate to exceed its original targets by achieving a 28% carbon reduction on its 2005 baseline. A variety of technologies such as LED lighting, building management systems, and a central Energy Management Bureau were implemented on a plethora of projects ranging from specific Energy Reduction Schemes to Asset Renewals and remodels and extensions.

5 FINANCING ENERGY EFFICIENCY

5.1 Financial barriers to energy efficiency

The business case to introduce energy efficiency measures has always existed and, with technological advancement, the payback periods associated with them have become shorter. The majority of measures can now pay for themselves through resultant savings, particularly with the variety of incentives that have been introduced such as is offered through the Enhanced Capital Allowances (ECA) and Green Deal schemes.

Despite this, energy efficiency take up so far has not been transformational, and is failing to meet its potential of reduced carbon emissions and increased energy security at lowest cost. There are a number of reasons for why this is the case, set out in section 3.2. These include: a lack of alignment with the strategic goals of a business; lack of awareness of the benefits; lack of skills and understanding to take up measures, and a lack of accountability and buy-in from decision-makers to lead energy efficiency take up.

In addition there are structural barriers relating specifically to the characteristics of the commercial property sector. For example, for occupiers on a short-term lease, energy efficiency measures are unlikely to be introduced unless the landlord can be incentivised to do so. The most significant barrier here is ownership of property and this is explored further in section 6.

Whilst, as highlighted above, the main barrier to the take up of energy efficiency is not necessarily the cost or the availability of finance, it is worth exploring how both of these factors can be addressed to make it easier for the commercial sector to utilise opportunities to take up energy efficiency.

5.1.1 High upfront costs

The level of upfront cost associated with energy efficiency projects is a barrier to businesses investing in energy efficiency[71]. Typical upfront costs for businesses investing in energy efficiency measures can be categorised as: 1) capital cost of measures; 2) transaction costs; and 3) hidden organisational costs. In addition, there are other factors relating to the characteristics of projects and the wider credit-worthiness of businesses in the commercial sector that increase the barriers posed by upfront costs of improving energy efficiency:

- The high transaction costs of implementing energy efficiency projects can prove burdensome for many organisations, particularly as many projects are often small in both size and value. For example, the maximum size of energy efficiency projects commissioned by respondents to an EEVS survey was £500,000 with 20% reporting projects of only £10,000[72]. Therefore transaction costs form a relatively large proportion of overall project costs.
- The 'hidden costs' associated with energy efficiency projects, such as disrupting business activity and obtaining planning permission, can also be considerably high.

71 National Audit Office (2007) 'The Carbon Trust – Accelerating the move to a low carbon economy'
72 EEVS & Bloomberg New Energy Finance (2013) 'Energy Efficiency Trends: Annual Report 2012/13'

Figure 8 below outlines typical areas of upfront cost associated with energy efficiency projects[73].

Figure 8: Typical upfront costs associated with energy efficiency projects

Capital cost of measures
- The capital cost of measures is often high

Transaction costs
- If necessary, conducting an 'investment-grade' audit
- Legal fees associated with negotiating contracts (particularly if implementing an energy performance contract)
- Cost of acquiring an appropriate mix of specialist commercial, management and technical skills.

'Hidden costs'
- The 'hassle cost' of disrupting normal business activity
- Costs of diverting resources to development of projects internally
- Cost of time in obtaining permissions and approval from external organisations, such as Local Authorities, for some works (applicable in rare cases)

Due to the initial high costs of technologies used in deep retrofits, this inquiry found that projects with lower capital expenditure requirements, such as lighting retrofits and behaviour change programmes, often prove most attractive to organisations when seeking to develop energy efficiency projects in a way that preserves their balance sheets.

5.1.2 Length of payback on investments

Although the majority of energy efficiency projects in the commercial sector have payback periods falling between one and seven years, some externally financed energy efficiency projects, can have longer payback periods associated with them, stretching up to 25 years in the case of current Green Deal finance[74]. Many businesses, and particularly SMEs, are unlikely to consider making investments with payback periods of greater than five years and typically favour smaller-sized retrofits with payback periods of between one to three years[75].

For example, whilst many energy efficiency measures such as building automation controls and behaviour change schemes, entail relatively short payback periods, measures such as ground source heat pumps and lighting retrofits can, dependent on the business, have far less attractive payback periods. Although larger businesses may

73 Adapted from: lavery/pennell (2013) 'The Next Manufacturing Revolution'; EU Joint Research Centre (2010) 'Financing Energy Efficiency: Forging the link between financing and project implementation'; inquiry interviews
74 The Green Deal Finance Company (2013) 'Green Deal Payment Plans: The Facts'
75 Department of Energy and Climate Change (2012) 'Research Report: Response to the Green Deal – research among the business community'

be able to work with a longer time-horizon compared to SMEs, three years is the prevailing benchmark for investment payback periods by many Chief Financial Officers (CFOs)[76].

The Carbon Trust has produced evidence to show that a typical project Internal Rate of Return (IRR) in the range of 40-50% can persuade some CFOs to extend payback periods by at least a year[77] but this does not address longer payback periods. This underlines the need and appetite for more innovative finance products for energy efficiency and is discussed in more detail in sections 5.2 and 5.3.

5.1.3 Alternative classes of energy efficiency finance

The inquiry also found that structures inherent within many finance institutions create a barrier to investment in energy efficiency. Many institutions use counter-party debt lending based upon the credit-worthiness of customers. However, as outlined below energy efficiency investments may also be categorised into distinct 'asset classes' that generally require either 'project' or 'asset' finance.

5.1.3.1 Project finance

Financial institutions will typically evaluate the merits of any investment opportunity, energy efficiency or otherwise, using methodologies based upon pre-defined 'asset classes'. In the first instance debt-financing of energy efficiency projects would seem the most logical solution and often financiers will look to deploy 'project finance' in such cases. However, project finance is only suited to large projects, typically in the tens of millions of pounds and many energy efficiency projects are too small in isolation to be suitable for this type of finance[78]. Typically project finance will only be deployed for smaller projects where they can be aggregated with similarly characterised projects into larger portfolios.

5.1.3.2 Asset finance

Financial institutions may also consider 'asset finance' for energy efficiency projects. Lending is provided for specific assets, for example funding for a lighting retrofit or installation of a ground-source heat pump. This form of finance is often difficult to structure for energy efficiency as energy efficiency assets typically have a low collateral value. This is due to it being difficult and highly uneconomic to remove energy efficiency assets for use elsewhere, such as, the uninstallation of lighting or insulation measures. Moreover, collateral value is low as most projects have high portions of engineering, development and installation costs.

It is for this reason that such asset-based lending is unsuitable for many projects and forces lenders to place a greater emphasis on the credit-worthiness of the business involved when calculating the cost of energy efficiency finance. Finance can subsequently prove too expensive for many organisations in the commercial sector[79].

76 The Carbon Trust (2010) 'The Business of Energy Efficiency'
77 Ibid
78 EU Joint Research Centre (2010) 'Financing Energy Efficiency: Forging the link between financing and project implementation'
79 An exception to this is using a 'lease-back' model where specific technologies, such as more efficient pieces of office equipment, are leased directly to a company by the lender. In the UK this is not an attractive model as it can only be easily applied to stand-alone improvements, such as more efficient printers, and does not address the problem of implementing more comprehensive retrofits which may involve a range of technologies and therefore do not fit into such a leasing model.

Overall, there is a strong case for greater Government involvement to communicate to large financial institutions that there is a strong need to innovate their financial products to better suit a market primarily composed of relatively small projects with high upfront costs, low collateral asset values and sometimes long paybacks. Fundamentally, a modified 'asset class' into which energy efficiency projects can be placed needs to be created for such projects to be given serious attention by many lenders. The UK Green Investment Bank (GIB) could play a role in helping to develop this, although as discussed later, in its present form the GIB itself is also not well suited to investing in smaller projects and is not looking to fulfil this role, instead concentrating on becoming a traditional banking institution.

5.1.4 Credit-worthiness and 'The Recession'

The 2008 financial crisis and resulting economic climate has squeezed profit margins and increased capital constraints across the commercial and other sectors. This inquiry also found that it has also increased the sensitivity of senior executives in many commercial businesses to the risks of taking on additional debt, including debt finance for energy efficiency investments.

This is felt particularly acutely by subsidiary companies that are part of group structures, because of the more complex financial approval processes that often accompany groups. If the parent company is publicly listed, CFOs must also consider that the increased level of indebtedness, arising from increased borrowing to meet upfront project costs, can impact negatively upon the traded value of the company[80].

5.1.5 Finance issues particular to the SME sector

In addition to the issues discussed above, SMEs are particularly susceptible to a lack of available finance for the following reasons:

- Cost: Savings can be significant, however energy costs are often one of the smaller costs in the profit and loss account. Given SMEs operate with little time-resource already, management time is often focused on more material areas of cost reduction.
- Finance: For smaller companies, SMEs in particular, finance is an obstacle. Whilst there is some evidence that the finance industry is lending to SMEs, finance is simply unavailable or at a cost that is prohibitive for many SMEs, and could crowd out other investment more essential to the growth of the business.
- SMEs in particular often have smaller amounts of cash available for upfront investment. In a recent survey 26% of SME-respondents said that they did not have the cash resources, or management time, required to make energy efficiency investments[81].

80 The Rockefeller Foundation & Deutsche Bank (2012) 'United States Building Energy Efficiency Retrofits: Market Sizing and Financing Models'
81 npower (2013) 'npower Small Business Energy Index 2013'

5.2 Existing schemes to tackle financial barriers

This report finds that awareness of existing schemes that tackle some of the financial barriers to energy efficiency is low. Figure 9 details three such schemes that are available to the commercial sector.

The Enhanced Capital Allowance (ECA) scheme provides an opportunity for companies with taxable profits to reduce their Corporation Tax liability through investments in qualifying energy efficiency measures. The inquiry learned however that awareness of the scheme within the commercial sector was relatively poor and many companies were missing out on the opportunity to benefit from it.

Figure 9: Key Government-Backed Schemes to Reduce Upfront Costs

Enhanced Capital Allowance Scheme

The Enhanced Capital Allowance (ECA) scheme is managed by the Carbon Trust on behalf of the Department of Energy and Climate Change (DECC) and is designed to encourage companies to invest in energy-saving plant or machinery equipment. The scheme does this by allowing companies to 'write off' the whole upfront cost of qualifying equipment against taxable profits made in the year of their purchase[82]. This helps to reduce the upfront cost burden associated with typical investments in energy efficiency by allowing companies with taxable profits to reduce their corporation tax liability after making energy efficiency capital purchases. The maximum tax saving will be equal to the cost of the qualifying measure multiplied by the effective Corporation Tax rate for the company. For example, a company paying Corporation Tax at 23% that invests £100,000 in qualifying energy efficiency measures could save up to £23,000 on their Corporation Tax liability[83].

In order to participate in the scheme, companies must have taxable profits and purchase qualifying equipment that is included on the Energy Technology Product List[84] at the time of purchase. Technologies currently on this list include measures such as lighting, Heating Ventilation and Air Conditioning (HVAC) and boiler equipment. The Energy Technology Product List provides useful information for suppliers and consumers alike on which companies manufacture individual technologies to provide confidence in the eventual performance of that product. Moreover, products included on the Energy Technology Product List can be labelled using the ETL logo, making it easier for procurers to identify ECA-qualifying products.

'Grants4Growth'

The New Anglia Local Enterprise Partnership (LEP), covering both Norfolk and Suffolk counties, has been designated a 'Green Economy Pathfinder' (GEP) with the aim of reducing carbon emissions by 60% in the local area by 2025 from a

82 The Carbon Trust (2012) 'The Enhanced Capital Allowance scheme for energy-saving technologies: A guide to equipment eligible for Enhanced Capital Allowances'
83 Subject to the availability of taxable profits
84 https://etl.decc.gov.uk [Accessed 9 September 2013]

2004 baseline[85]. As a result, the LEP has a strong focus on helping businesses in the local area achieve sustainable, low carbon growth through the production of low carbon goods and services and improving the sustainability of their operations. The 'Grants4Growth' scheme, supported through the European Regional Development Fund, provides practical help and financial grants to help small businesses reduce costs and increase their competitiveness and future resilience.

Whilst the scheme does provide revenue-based grants to help mainstream 'cleantech' products, capital grants are made available for businesses wanting to invest in energy efficiency, through the implementation of technology or processes that facilitate growth and reduce the environmental impact of their operations. Grants are available for up to a maximum of 28% of the capital spend on a project such as energy efficiency and are designed to help businesses meet the upfront costs associated with such projects[86]. In this way the scheme helps to overcome the financial barrier to some energy efficiency measures of high upfront costs.

Additional Scheme to Reduce Upfront Costs

Carbon Trust & Siemens Energy Efficiency Financing
The Carbon Trust and Siemens Energy Efficiency Financing (EEF) scheme is a joint partnership between the two organisations that aims to provide UK businesses with finance for energy efficiency equipment. The scheme is worth over £550 million over a three year period from 2011-2014[87]. In addition to helping businesses reduce their energy bills through investment in energy efficiency, the scheme is also designed to foster a more environmentally sustainable growth model for the UK's private sector and unlock business investment in the UK's low carbon economy. The scheme utilises the financial backing and funding provision of Siemens Financial Services Ltd in the UK, and the expertise of the Carbon Trust in assessing the potential cost-savings from the implementation of energy efficient technologies, to provide a dedicated funding stream for small and medium-sized (SME) businesses in the UK.

The EEF scheme gives businesses an opportunity to finance energy efficiency improvements without needing to commit their own existing capital to meet the high upfront costs, leaving their own capital free for use on more core business activities. In addition, the level of flexibility that the scheme provides for finance repayment is of particular use for the commercial sector with the value of financing available being as low as £1,000 and no upper limit being set, subject to a standard organisational credit-check. This means that smaller projects can access finance where they would typically struggle to do so from mainstream lenders. Moreover, the repayments are potentially deductible from the company's taxable profits, reducing their Corporation Tax liability. The finance can also be paid over terms ranging from one to seven years meaning that the scheme is well-suited to small business customers with relatively short-term horizons[88].

85 New Anglia LEP (2013) 'Towards a Growth Plan'
86 New Anglia LEP (2013) 'Press Release: "GRANTS4GROWTH – Local Enterprise Growth & Efficiency Programme"'
87 The Carbon Trust & Siemens (2011) 'Press Release: "The Carbon Trust and Siemens launch new green finance deal worth £550 million to green businesses in the UK"'
88 The Carbon Trust & Siemens (2012) 'Energy Efficiency Financing: Unlock opportunities for additional sales – Supplier benefits'

The Government should play more of an active role in disseminating information to the commercial sector via key industry-sector bodies. As discussed in section 4.1, rather than creating individual websites for schemes such as the Green Deal, ECA and Siemens Energy Efficiency Finance scheme, the Government should provide a dedicated non-domestic energy efficiency 'hub' website that summarises all schemes available for energy efficiency. This website should act as a 'first port of call' of information provision for the non-domestic sector, highlighting key information and successful case studies for each scheme, and guiding users to the most appropriate schemes for them to make use of.

5.2.1 Green Deal finance

The Green Deal is one of the Department of Energy and Climate Change's (DECC) flagship policies, designed to help both domestic and non-domestic consumers increase the energy efficiency of their properties, thereby reducing their carbon emissions and reducing their energy bills. It is a market-based scheme that provides upfront funding for energy efficiency improvements which is paid back over time through additional charges levied on a consumer's electricity bill and linked explicitly to the property's energy meter. A further strength of the scheme's premise is that it gives consumers a finance option that they would not otherwise have.

This is particularly valuable for commercial SMEs which often do not have either the cash reserves or ready access to finance required to cover the upfront costs of energy efficiency projects. Whilst this means that SMEs are more likely to take up the Green Deal, larger businesses with weaker balance sheets may also consider the scheme as a potential source of energy efficiency finance.

Take up of the non-domestic Green Deal has effectively not yet begun, and this inquiry heard many different concerns relating to how the non-domestic Green Deal is currently conceived. These commonly fell into two distinct areas: use of the 'Golden Rule' and the cost of Green Deal finance.

5.2.1.1 The 'Golden Rule'

The 'Golden Rule' mandates that the Green Deal charge on the consumer's electricity bill will not exceed the expected energy bill savings for a consumer as a result of them installing recommended Green Deal measures; and that the length of the payment period should not exceed the expected lifetime of the measures installed. This requirement was identified as a key factor by DECC, prior to the launch of the Green Deal, for businesses to have confidence that the scheme would provide guaranteed savings[89].

However, there are a number of issues with the 'Golden Rule' in the non-domestic Green Deal. Firstly, the Green Deal Assessment methodology adopts conservative 'in-use' factors for each Green Deal measure in order to reflect the current uncertainty

89 Department of Energy and Climate Change (2012) 'Research Report: Response to the Green Deal – research among the business community'

around the performance of individual measures 'in situ' compared to their technical potential[90]. Aside from this there is no rigorous process or requirement for validation of Green Deal measures to ensure full payback on investment. As a result this inquiry heard that many consumers are highly sceptical that Green Deal measures will pay for themselves over time. More authoritative studies into the actual savings achieved by implementation of Green Deal measures will be required in the future to provide confidence to commercial-sector consumers.

In addition, a Green Deal Assessment only provides a time-static 'snapshot' of a property's energy performance and does not account for significant changes in future energy use thus potentially undermining the principle of the 'Golden Rule'. An example of this would be where a new occupier uses premises, with a Green Deal attached, for a significantly different type of business activity, with different energy requirements than previous occupiers. This invalidates previous 'Golden Rule' calculations[91] and burdens new occupiers with a Green Deal charge which may exceed the savings accumulating from Green Deal measures.

As commercial leases for properties are on average 4.8 years[92] the chances of new commercial occupiers entering a property with a Green Deal attached to it are quite high and therefore this is a very real issue in the commercial property sector. The Government is yet to differentiate the non-domestic Green Deal from the domestic scheme in this respect and therefore needs to investigate this further in order to provide a workable solution to account for a significant change in the use of commercial premises with a Green Deal attached.

It is for these reasons that the use of the 'Golden Rule' for the non-domestic Green Deal is unnecessary and would constrain businesses from carrying out larger Green Deals based on a bespoke energy saving profile, that run the risk of being non-compliant with the Golden Rule. At the same time, unlike domestic users, businesses may be able to assess the likely change in their energy usage over time and therefore the likely level of savings that energy efficiency measures may lead to.

The Government should therefore remove the 'Golden Rule' requirement attached to the non-domestic Green Deal scheme and consider alternative ways of ensuring that Green Deal loans to the commercial sector can be provided at competitive levels of cost. A suggested method for doing this using the platform provided by The Green Deal Finance Company (TGDFC), and financed through the GIB, is discussed in further detail below.

Recommendation 6

The Government should remove the 'Golden Rule' requirement attached to the non-domestic Green Deal.

90 Department of Energy and Climate Change (2011) 'How the Green Deal will reflect the in-situ performance of energy efficiency measures'
91 UK Green Building Council (2013) 'Green Deal Non-Domestic Round Table'
92 BPF/IPD (2012) 'Annual Lease Review 2012'

5.2.1.2 The Green Deal Finance Company and Green Deal Interest Rate

At present, the interest rate for domestic Green Deals has been initially established at 6.96% for a fixed term of up to 25 years by The Green Deal Finance Company (TGDFC)[93], which acts as the main finance provider for the Green Deal. TGDFC was set up by the private sector, with Government as a significant stakeholder, to be a not-for-profit vehicle to provide the finance to the whole domestic energy efficiency market at a universal rate. This rate is available to almost all applicants and is a universal rate applicable to all over a 'de minimis' credit threshold. It therefore compares extremely favourably to any other forms of unsecured long-term finance, such as credit card loans, for organisations for whom finance would otherwise be a barrier[94].

TGDFC are able to achieve this pricing based on a projected portfolio of a large number of aggregated small domestic loans with the pricing reflecting the cost of taking into account projected loan losses and defaults. In addition, this rate is irrespective of the term of the loan, up to the 25 year limit, thereby incentivising larger and longer-term Green Deals to be implemented. TGDFC's underlying finance comes from a combination of DECC, its private sector stakeholders, and the GIB.

Investment by these stakeholders has allowed the creation of the company and the development of its IT systems, legal documentation and staff capability to administer Green Deal loans; a capability that could also be used for the provision, and administration, of loans to companies in the commercial sector. However, to date TGDFC has not attempted to give loans to the commercial sector for a variety of reasons:

- The variance in credit quality between companies would mean that any aggregation of loans would make the subsequent 'blended price' of finance uncompetitive for companies at the larger end of the spectrum, therefore exposure would be concentrated on smaller companies.
- Energy efficiency measures for different companies have very different life spans such that one rate for any period would be inappropriate.
- Green Deals are unlikely to remain attached to the energy meter that belonged to a company formerly occupying the building under an existing lease, as landlords will not take the risk of a successor company not agreeing to the Green Deal charge. This not only limits the life of a commercial Green Deal considerably but also the protection to the lender, of the transfer of a Green Deal to a new occupier, which is afforded by a domestic Green Deal.

Instead of aiming to provide loans to all companies in the commercial sector, TGDFC could be encouraged and assisted by Government to focus on a smaller range of SMEs most obviously experiencing finance as a barrier to investment. For example, for loans under a threshold of £50,000. A large number of similar loans could be aggregated and financed in a similar way to domestic Green Deal loans and by using TGDFC as

93 The Green Deal Finance Company (2013) 'Green Deal Finance Company launches competitively priced finance open to all'
94 Capital Economics (2013) 'How competitive are Green Deal Finance loans?: A review of the overall cost of borrowing for green home improvements'

the vehicle to do this, the Government could allow SMEs to quickly access finance. This would also link such loans to the existing, loans administration platform (i.e. TGDFC) therefore using the same company to administer the loans cheaply and in turn benefit the domestic sector by sharing this infrastructure cost with the commercial sector.

In order to make this possible two key structural changes are required:

- Loan costs will need to vary, depending on the term of the loan, to make them at least as competitive as traditional finance for SMEs. Removal of the 'Golden Rule' from non-domestic Green Deals would help in this regard.
- The Government will need to 'seed fund' a subsidiary of TGDFC, required to initiate SME finance, as TGDFC currently has no access to additional capital from the private sector at the rates necessary to make such finance competitive.

In this way TGDFC would also be able to provide commercial Green Deal loans without the need for the 'Golden Rule', required for domestic Green Deal loans, and as has been suggested earlier in this report. However, as explored below, there is an opportunity to make a more radical contribution to TGDFC's ability to finance the SME market, at a low cost to the Government, through the use of the GIB and Government guarantees.

5.2.2 The UK Green Investment Bank

The UK Green Investment Bank (GIB) was formed in May 2012 as a public company having been previously set up as 'UK Green Investments' operating within the Department for Business, Innovation and Skills. The Bank became fully operational in October 2012, and now has £3.8 billion worth of taxpayer capital, having being granted 'State Aid' approval by the European Commission to make investments on commercial terms[95].

The GIB's overarching mission is described as being, *to accelerate the UK's transition to a green economy and to create an enduring Institution, operating independently of Government*. To this effect the Bank plans to deploy 80% of its capital into several priority sectors including offshore wind, waste recycling and energy from waste, and energy efficiency (including support for the Green Deal)[96]. State Aid approval from the European Commission restricts the GIB from providing grants or regional assistance or otherwise acting in a non-typical commercial manner such as being a taker of high risk for low reward on investments. The GIB therefore uses its position as an investor to leverage private-sector finance for investments and 'crowd in' private sector investment, reportedly mobilising £3 of private sector funding for every £1 that it invests[97].

In terms of prioritising investment in energy efficiency, the GIB's role has been to try to address specific market barriers, such as a lack of market-scale and availability of

95 UK Green Investment Bank (2012) 'Our Investment Approach'
96 Further details available at http://www.greeninvestmentbank.com/who-we-are/default.html [Accessed 4 November 2013]
97 UK Green Investment Bank (2013) 'Annual Report'

long-term funding for energy efficiency projects. However, the GIB will typically only participate in larger deals of approximately £30 million or more which still excludes the majority of commercial-sector energy efficiency projects. In order to circumvent this, the GIB has appointed three separate fund managers, Sustainable Development Capital Ltd, Equitix and Aviva Investors to manage investment in smaller energy efficiency deals, from £0.5 - £30 million, with £50 million each of funding to be equally matched by each fund manager. This report understands that investments have so far been made primarily in renewable energy, such as biomass boilers, and it is unclear to what extent these smaller funds have been deployed in project portfolios containing individual projects worth less than £0.5 million.

The GIB has been a significant and successful catalyst in getting TGDFC off the ground for domestic energy efficiency, and at this development stage is the sole senior lender, with committed finance of £125 million. This finance is senior to £75 million lent by the private sector and DECC to get TGDFC started and to initiate deals, and whose injection was a condition from the GIB to give their loans a degree of protection. The value of Green Deals on TGDFC's balance sheet will go to repay the GIB before other stakeholders.

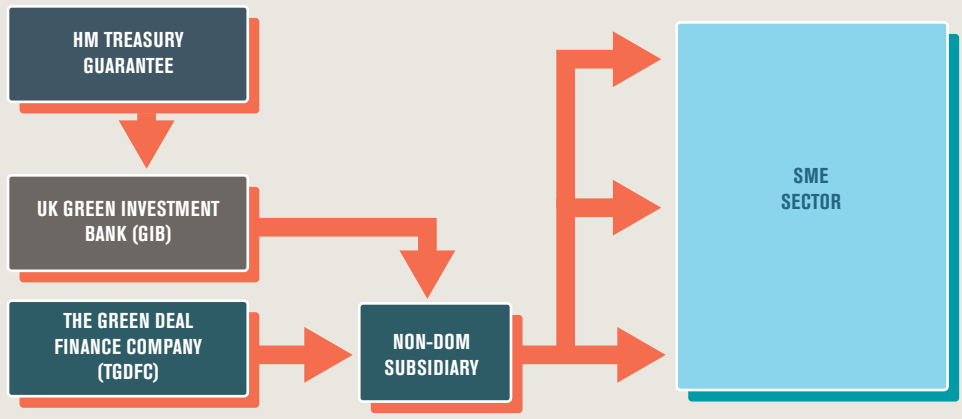
The GIB, alongside TGDFC, has begun to consider whether TGDFC can be financed to deliver loans to the commercial sector. However, the barriers and risks previously identified mean that this may not be a feasible solution until the non-domestic market matures in size, which will not occur until finance becomes more readily available and therefore offering a universal rate to the whole of the commercial sector may be overly ambitious.

The characteristics of the smallest SMEs (micro-businesses with less than nine employees) are not that dissimilar from users in the domestic sector and therefore TGDFC could be capable of accurately pricing SME loans at the aggregate level. However, it has not been able to develop this capability due to the lack of available junior finance and GIB support. The existing junior finance raised by TGDFC has served to establish the company and its capacity to administer the domestic Green Deal, but the slow take up in demand means that it is extremely unlikely TGDFC would be able to access further similar finance for a non-domestic subsidiary. Without some form of junior finance, or similar underpinning, the GIB, which maintains strict lending criteria, will not be able to lend to such a subsidiary.

The Government has however recently introduced a guarantee facility based in HM Treasury, where guarantees can be given to financiers to protect them from project risks. This uses the Government's balance sheet, but on a contingent basis such that no actual cost is incurred and the UK has spare capacity to issue such guarantees within its Maastricht borrowing limits. This guarantee facility is currently being introduced on a number of major infrastructure projects in the UK to ensure the availability and low price of underlying debt finance.

As it is clear that the non-domestic sector needs a significant catalyst to kick start the market for energy efficiency, and that for smaller SMEs finance is a clear barrier to investment, there is an opportunity to make a radical change combining the resources of TGDFC, GIB and HM Treasury. This inquiry has found that there is a huge opportunity to kick-start SME finance for energy efficiency through the creation of a non-domestic subsidiary of the TGDFC. This could offer low rates of interest, relating to the term of each loan provided, funded by the GIB but under guarantee from HM Treasury. Furthermore, this would allow TGDFC to benefit from extremely competitive rates, directly related to the cost of Government 'fixed-interest loan securities', given the GIB's lending will be guaranteed by Government, and to pass these directly on to customers. A flow diagram illustrating the structure of this framework is displayed below.

Figure 10: UK GIB/TGDFC/HM Treasury SME low-interest loan framework



This framework would allow an initial provision of low cost finance to SMEs, but would not involve any cash injection by Government, simply a use of its guarantee facilities. This would therefore be a highly efficient use of the Government's balance sheet to secure long-term and cheap funding for energy efficiency that is achieved not through subsidy but guarantee. To maximise the chances of this scheme succeeding it must be combined with effective marketing and awareness-raising efforts from Government as outlined in recommendations three and four. The GIB could also learn from the KfW which has instituted a highly successful model for lending to the German SME sector.

Recommendation 7

The UK Green Investment Bank should fund a non-domestic subsidiary of The Green Deal Finance Company, under guarantee from HM Treasury, to offer low-interest loans to SMEs to stimulate the market for energy efficiency.

KREDITANSTALT FÜR WIEDERAUFBAU (KFW) BANK

CASE STUDY

Structure

The Kreditanstalt für Wiederaufbau – KfW ('Credit Institute for Reconstruction') is a German financial institution. The German Federal Republic has a significant role to play in shaping the direction of the KfW as it holds a majority 80% share whilst individual federal states constitute the remaining 20% shareholding[98]. The KfW has a 'Board of Supervisory Directors' whose function is to supervise the conduct of the Bank's business and the administration of assets. There are 37 members of the KfW's Board made up of several federal ministers and representatives from banks, industry, municipalities and trade unions.

As of 2012, the KfW Bank had a balance sheet totalling €511.6 billion and a yearly refinancing volume of €73.4 billion, whilst maintaining a triple 'A' rating of KfW bonds from FitchRatings, Moody's and Standard&Poor's[99]. The wide-ranging aims of the Bank's lending include promoting Germany's SME and start-up business sectors, promotion of housing construction and refurbishment and provision of infrastructure loans.

KfW's Energy Efficiency Programme

A business survey carried out by the KfW found that SMEs in particular were more likely to need third party financiers to fund energy efficiency investments due to a lack of ready capital[100]. To aid this the KfW has a two-strand package of lending for energy efficiency investments in Germany's commercial sector.

The first is a programme of energy advice grants available for SMEs throughout the commercial sector to help identify potential energy savings. An 80% grant (of up to €1,280) is available for an initial energy check, and a 60% grant (of up to €4,800) for detailed analysis and advice. KfW ensures this process maintains a high level of rigour by requiring that such advice is given by a consultant qualified through the 'KfW consultancy-exchange' or an 'authorised expert' who meets specific criteria. Moreover, consultation advice must be provided in a standardised format as specified by KfW.

The second strand is of energy efficiency finance. This finance is also available to freelance professionals and companies, such as ESCos[101], ensuring that finance is promoted to the 'micro' end of the business spectrum. Loans are typically provided for measures such as more efficient machinery, measurement and regulatory technologies, and building fabric retrofit measures. Moreover, investments must meet one of two criteria:

1) Equipment replacement must lead to energy savings of at least 20% compared to average energy use over the past three years;
2) New investments must lead to energy savings of at least 15% compared to the average of each respective industry[102].

Whilst varying according to the credit-worthiness of each company; financing up to a maximum of €25 million is available for 100% of the costs of energy efficiency investments with highly flexible repayment terms of up to 20 years. Fixed interest rates

98 KfW (2013) 'KfW presents itself: Structure and Mission of KfW Group'
99 Ibid
100 KfW (2006) 'KfW Survey on Disabling and Enabling Factors in Corporate Energy Efficiency'
101 KfW (2013) 'Merkblatt: Energieeffizienz im Unternehmen'
102 KfW (2013) 'KfW's Financing of Energy Efficiency in the Corporate Sector'

are offered for projects lasting 10 or more years and applicants are given the option of using a 'grace period' of up to three years, making the scheme particularly flexible for KfW loan-applicants with less stable revenue flows.

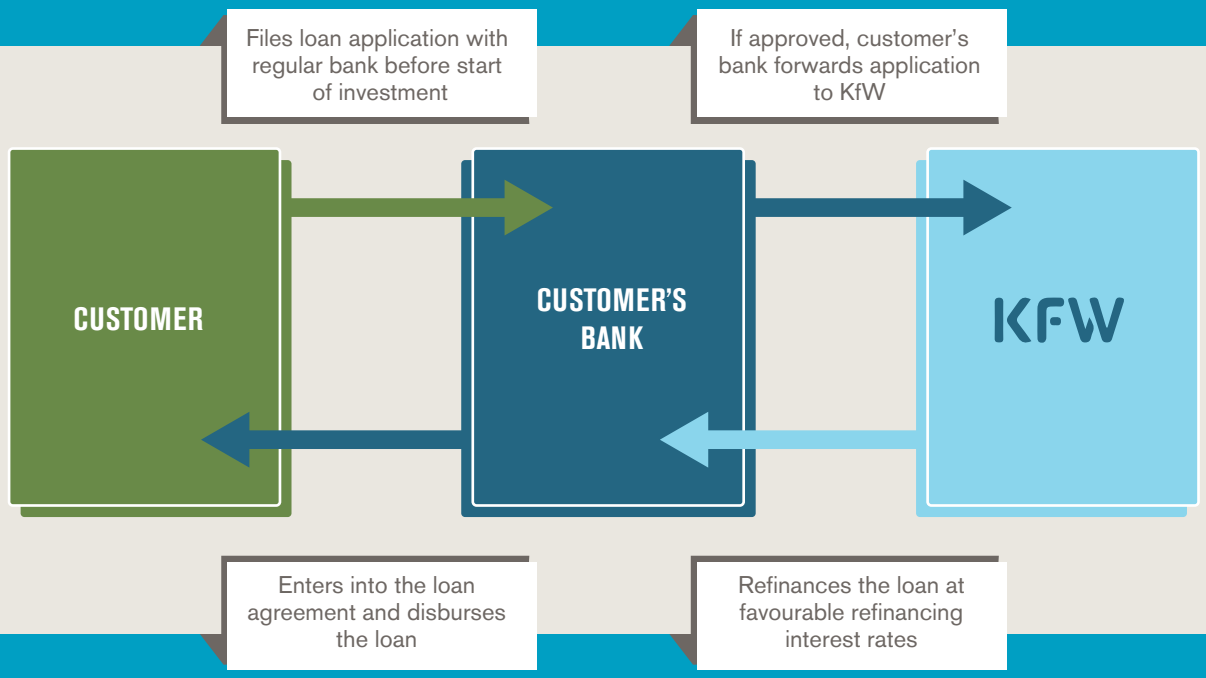
The KfW Process of Lending for Energy Efficiency

The KfW does not operate its own network of regional or local branches; but uses the principle of 'on-lending' to work in partnership with, and provide finance to, commercial banks.

As the diagram below illustrates[103], customers submit an application to their main bank which contains confirmed CO_2 reduction predictions from a qualified and registered energy assessor. The local bank then reviews the application, identifies the KfW programme that applies to the customer and advises on the conditions of such a loan. The local bank then forwards the application to the KfW which is able to make use of its favourable credit-rating to draw down finance from capital markets at a relatively low cost. The KfW then provides a loan for which the local bank is responsible and which can then draft a loan contract with their customer.

As interest rate subsidy by KfW funds through this programme is restricted, KfW avoids infringing EU 'State Aid' law by unfairly subsidising German companies or from competing directly with commercial banks. This allows KfW to focus on its 'core competences' of borrowing from capital markets and minimises the risk arising from lending to a high number of energy efficiency projects.

The KfW Lending Model



Successes

In 2012 the KfW supported 2,315 projects as part of its Energy Efficiency Programme, totalling over €3.5 billion in financial support for private companies. In addition, since its inception the KfW has also been hugely successful in providing finance for the refurbishment of private buildings or for newly built energy efficient buildings, with over 9 million pre-1979 private homes being brought up to 'high' energy efficiency standards as of 2010.

103 KfW (2013) 'KfW Bankengruppe presents itself: Structure and Mission of KfW Group'

5.3 The Energy Service Company Model

The potential role of the Green Deal Finance Company (TGDFC) and the UK Green Investment Bank (GIB) in helping the commercial sector obtain finance is significant. However, it is important to note that alternative sources of finance such as making use of the Energy Service Company (ESCo) model are also available.

An ESCo is typically contracted to coordinate the development and project management of an energy efficiency project and may choose to finance an energy efficiency project through use of its own cash reserves. However, it is more typical for an ESCo to seek third party project finance in order to avoid putting debt on their own balance sheets.

The ESCo model has been particularly successful in the USA. However, approximately 80% of all US Energy Performance Contracts (EnPCs) are contracted in the 'MUSH' (Municipal, University, School & Hospital) market[104]. The ESCo provides long-term lease certainty and overcomes issues of budgetary constraints and a lack of in-house skills to take on energy efficiency projects.

Although the UK ESCo market is thought to be worth €400 million per year, it contains only around 20 ESCos[105] and remains under-developed and focused overwhelmingly on the public-sector[106].

5.3.1 Growing the UK ESCo market

The ESCo model suffers significantly from an inherent complexity as a financing structure for investment in energy efficiency. Furthermore, the transaction costs associated with many EnPCs can be very high relative to the overall value of the project due to costs such as legal fees given the highly commercial nature of EnPCs.

To begin to reverse this trend the Government should concentrate on facilitating the dissemination of successful case studies of the use of energy performance contracting, throughout the commercial sector, in particular highlighting the lessons learned from the RE:FIT scheme detailed below.

5.4 The RE:FIT Scheme

There are notable lessons to be learned from the public-sector in making use of rigorous frameworks for assessment, procurement and Measurement and Verification (M&V). Pioneered by the Greater London Authority (GLA), RE:FIT (Figure 11 below) provides a robust set of guidance for public-sector organisations to apply to energy efficiency projects when retrofitting their property portfolio. This has helped to neutralise much of the uncertainty associated with third party financing of such projects, through guidance on energy efficiency procurement, and has proved highly successful in helping public-sector bodies access the finance required.

104 The Rockefeller Foundation & Deutsche Bank (2012) 'United States Building Energy Efficiency Retrofits: Market Sizing and Financing Models'
105 EU Joint Research Centre (2010) 'Energy Service Companies in Europe – Status Report 2010'
106 Ibid

Figure 11: The RE:FIT Programme

The RE:FIT programme is a joint project being delivered by the Greater London Authority (GLA) in partnership with Clinton Climate Initiative (CCI) and the C40 global network of cities. The programme is designed to speed up the process of implementing energy efficiency retrofit in London's public-sector buildings and forms a key part of the Mayor of London's climate change mitigation and energy strategy[107]. Having been piloted in London, the RE:FIT programme is now being rolled-out across the country with Nottingham and Leeds City Councils amongst the first Local Authorities to adopt this model for public-sector energy efficiency retrofit.

The programme provides a commercial model for public bodies to implement energy efficiency retrofit in their buildings through the use of a specially appointed ESCo. Supported by a dedicated Programme Development Unit (PDU), robust savings predictions of up to 28% per annum and resultant payback periods of between five and seven years are identified on a bespoke basis. This is followed by a consultation on what source of finance would best suit each portfolio of projects[108].

The potential of the scheme to aggregate a portfolio of public-sector buildings is crucial in helping the provision of low-cost finance for Local Authorities participating in the scheme. Furthermore, RE:FIT provides a checklist for RE:FIT project managers within public bodies to follow in the form of a Memorandum of Understanding (MoU)[109] and 'Starter Pack'[110] that is agreed by participating organisations. This covers a range of activities, from obtaining executive support to reporting programme information back to the PDU.

Lessons learned from RE:FIT could potentially help commercial-sector consumers and lenders to standardise the procedural aspects of energy efficiency projects, for example through use of the International Performance Measurement and Verification Protocol (IPMVP) that is currently being used for some of the projects initiated under RE:FIT. This standard is enabling such projects to assure financing parties, and RE:FIT participants, of the predicted energy savings to be made from implementing each RE:FIT project and is detailed in Figure 12.

107 Greater London Authority (2011) 'Delivering London's Energy Future: The Mayor's Climate Change Mitigation and Energy Strategy'
108 RE:FIT: 'Briefing Note'
109 RE:FIT: 'Memorandum of Understanding - Commitment for participating in RE:FIT'
110 RE:FIT: 'Starter Pack - A guide to using the RE:FIT Framework'

Evidence of successful uses of RE:FIT need to be disseminated throughout the commercial sector and given the scheme's roll-out to other Local Authorities, such as Leeds and Nottingham, the Government should play a strong role in doing this via relevant Government department websites and media networks.

Recommendation 8

The Government should profile case studies from the RE:FIT programme and outline where it has been a success so far and what lessons could be learned for implementation in the commercial sector.

5.5 International Performance Measurement and Verification Protocol

The IPMVP has helped to standardise the M&V aspects of many energy efficiency projects in the USA and is currently being championed by the Investor Confidence Project[111], coordinated by the Environmental Defence Fund, in its work to 're-educate' financial institutions in the USA around lending for energy efficiency. Whilst currently reported to add up to 10% to overall energy efficiency project costs, effective M&V is becoming increasingly necessary for projects, particularly commercial ones, to meet the 'Investment-Grade Audit' requirements of potential investors. As mentioned above, the use of the IPMVP has the potential to help boost investor and consumer confidence in the M&V aspects of energy efficiency projects.

111 http://www.eeperformance.org/ [Accessed 29 October 2013]

Figure 12: The International Performance Measurement and Verification Protocol (IPMVP)

The IPMVP is a framework of best practice for quantifying and communicating the results achieved by: energy efficiency investments; water efficiency investments; 'demand management' and renewable energy projects around the world[112]. Having been developed by the United States Department of Energy (DoE), responsibility for maintaining and publishing updated versions of the IPMVP was transferred to the Efficiency Valuation Organisation (EVO). Driven by the need for a common method of verifying savings predicted by Energy Service Companies (ESCos); the overarching purpose of the IPMVP is to increase the certainty, reliability and level of savings that can be achieved through the implementation of energy conservation measures. In so doing it reduces the transaction and finance costs associated with energy efficiency projects.

The IPMVP achieves these stated aims through both improving and standardising the methodologies used by energy efficiency practitioners and can also be used to certificate this. It details specific actions that help practitioners communicate both the findings of a project's M&V and the methodology used to obtain such results to their clients. It provides guidance on how different clients and practitioners might use IPMVP and how it can be applied to a wide variety of different buildings in the non-domestic sector. It also provides detailed instructions on what constitutes good practice, for energy efficiency projects, such as an exemplary timeline for planning and installation activities.

The cost of using such an effective level of M&V can provide a large disincentive for organisations to invest in such energy efficiency projects although the IPMVP guidance itself provides a guideline figure of M&V processes representing no more than 10% of overall project costs. Despite the inquiry collecting interview evidence echoing this figure, such costs are likely to be determined in a highly bespoke nature. For example, analysis of U.S. Federal level EnPC projects under the Federal Energy Management Program (FEMP) found that the average cost of M&V services fell between 3-5% of total project cost[113].

112 Efficiency Valuation Organisation (2012) 'International Performance Measurement and Verification Protocol: Concepts and Options for Determining Energy and Water Savings - Volume 1'
113 Clinton Climate Initiative (2009) 'Measurement and Verification and the IPMVP: EPC Toolkit for higher education'

Analysis from 'Energy Efficiency Verification Specialists' (EEVS) estimated that almost seven out of ten businesses surveyed in 2012 had not used a recognised 'good practice' standard such as IPMVP for commissioned energy efficiency projects[114]. This reduces the overall cost-effectiveness of such projects and businesses whose projects fail to meet expected targets as a result of not using rigorous M&V may become less willing to re-invest and find it more difficult to refinance such investment from lenders.

Whilst use of the IPMVP is likely to be restricted to larger projects with larger customers until the market matures, the Government could raise awareness, and encourage use, of such a robust M&V framework in anticipation of greater take up in the future as the market for ESCO-type energy efficiency projects expands.

Recommendation 9

The Government should integrate a version of the International Performance Measurement and Verification Protocol (IPMVP) into existing energy efficiency schemes such as the non-domestic Green Deal to promote the use of a universal framework for Measurement and Verification (M&V).

It is clear that the UK ESCo market is far from being sufficient to facilitate the large-scale take up of energy efficiency alone. However, it has the potential to service a part of the sector in the future after its usefulness is fully proven through take up in public-sector buildings. The RE:FIT programme provides a 'testing ground' for this and successful case studies must be disseminated widely to build business confidence in the ESCo model. The use of the IPMVP can improve the cost-effectiveness of energy performance contracting and lower the overall cost of energy efficiency finance. The Government could improve the effectiveness of its non-domestic energy efficiency schemes by integrating an appropriated version into such schemes as the Green Deal.

114 EEVS (2013) 'Energy Efficiency Trends Annual Report 2012/13: Essential insight for consumers and suppliers of non-domestic energy efficiency'

6 OVERCOMING SPLIT INCENTIVES IN COMMERCIAL PROPERTY

Government regulation should act as a driver to encourage property investors to increasingly favour buildings that can help them meet carbon and energy performance obligations placed on them to meet targets at the national level.

There is some evidence that the property market is beginning to recognise this as almost 43% of Real Estate Service firms, and 45% of property companies or developers, have predicted that the impact of sustainability on real estate business will increase in 2013[115]. This section discusses the 'split incentive' problem, often preventing both landlords and tenants from taking up energy efficiency measures and the changes that should be made to the 'regulatory landscape' to allow them to do so.

6.1 The problem of split incentive

The problem of split incentive arises in the commercial property sector and is commonly referred to as the 'landlord-tenant' problem[116]. This occurs when landlords do not feel the cost of energy bills, and therefore would not feel the gain from their reduction. They therefore lack the financial incentive to implement energy efficiency measures. Similarly, tenants do not want to bear the cost of such measures unless they can fully capture their benefit and are often prevented from doing so by lease lengths being shorter than payback periods and landlords feeling some side-benefit from an increased property value.

Lease lengths in the commercial property sector overall are typically short with the average lease length for SMEs being 4.1 years and only slightly longer for large businesses at 5.2 years[117]. This can conflict with the often long payback periods associated with energy efficiency investments that typically stretch for 5 years, and sometimes as long as 25 years, and can significantly exacerbate the split incentive problem.

6.2 Regulatory commitments and the split incentive

6.2.1 Energy Performance Certificate (EPC) regulation

EU legislation, such as the Energy Performance of Buildings Directive (EPBD), has the potential to be a major driver of energy performance improvements in commercial buildings in the UK, acting as a strong incentive for landlords to work to overcome the problem of 'split incentive' in their buildings. The EPBD requires that an Energy Performance Certificate (EPC) is issued for, *buildings or building units which are constructed, sold or rented out to a new tenant* and that Display Energy Certificates (DECs) be issued for larger public buildings over 500 square metres[118]. To date EPCs have mostly impacted upon the domestic rented-sector, where its requirement is mandatory. However, there has been some voluntary take up of EPCs in the commercial sector in anticipation of their enforcement by April 2018[119]. EPC regulation

115 Pwc & Urban Land Institute (2013) 'Emerging Trends in Real Estate 2013 – Europe: The Second Act - Optimism Returns'
116 Department of Energy and Climate Change (2013) 'Factors influencing energy behaviours and decision-making in the non-domestic sector'
117 Investment Property Databank (2012) 'Annual Lease Review 2012'
118 s. 1(a), Art. 12, European Commission (2010) 'Directive 2010/31/EU of the European Union and of the Council of 19 May 2010 on the energy performance of buildings (recast)'
119 HM Government (2011) 'The Energy Act (2011), s. 49(6)

alone has the potential to have a transformative effect on the commercial property market as landlords will be forced to consider the energy performance of their property and make the necessary improvements to comply with the legislation by obtaining an EPC rating of at least an 'E'.

6.2.1.1 Enforcement

However, evidence obtained earlier this year, via a Freedom of Information (FOI) request to the Department for Communities and Local Government (DCLG), suggests that compliance with current EPC regulation in the private-rented sector is much lower than expected with only 26% of domestic, and 39% of non-domestic, rentals providing EPCs as required[120]. In order for EPC regulations to realise their full potential in providing a strong 'stick' of encouragement for take up of energy efficiency in commercial buildings, strong regulatory enforcement must be of paramount importance in ensuring maximum compliance. At present there is no tangible punishment for non-compliance and therefore it would be helpful if the Government introduced a substantial penalty for owners and landlords failing to produce an EPC when required.

Recommendation 10

The Department for Communities and Local Government should introduce a strong penalty for non-compliance with minimum EPC standards to properly enforce the regulation.

6.2.1.2 EPCs: Predicted versus actual energy performance

As discussed above, incoming EPC regulation in 2018 will provide a strong baseline-incentive for commercial landlords to upgrade the energy performance of their property portfolio. Unfortunately, it provides more of a minimum standard for landlords to comply with rather than directly facilitating the growth of the market for energy efficient buildings. Therefore it will not necessarily result in strong 'beyond compliance' behaviour as the regulation will not necessarily stimulate greater demand for sustainable buildings.

Furthermore, the use of EPCs runs the risk of the commercial property sector being subject to the as yet unresolved 'energy performance gap' arising from inaccuracies in actual building management once a retrofit has been completed. This is coupled with building models being unable to account for unanticipated changes in occupant behaviour such as a change in business activity[121]. A further 'perception gap' arises through retrofit designs also making inadequate allowance for additional factors, such as low power consumption from local plug sockets and IT systems. Calculations for the production of an EPC can therefore fail to account for the entirety of a commercial building's energy use[122]. This means that EPC ratings may not necessarily reflect the true energy performance of a building and are unlikely to encourage commercial landlords to go beyond the minimum EPC standard required of an 'E rating'.

120 Department for Communities and Local Government (2013) 'Freedom of Information Request - Energy Performance Certificates Compliance'
121 Green Construction Board – Buildings Working Group (2013) 'The Performance Gap: Causes & Solutions'
122 Bordass W, Cohen R, and Field J (2004) 'Energy Performance of Non-Domestic Buildings: Closing the Credibility Gap'

For example, a 2012 comparative study of two EPC-rated Government buildings in London found that a building with a worse EPC out-performed a higher-scored building, in terms of actual energy efficiency, by 66%[123]. In this case the differences in the occupier's energy demands had a significant impact on each building's actual energy usage, resulting in such a disparity between the buildings.

6.2.2 Display Energy Certificates (DECs)

As mentioned, another form of building energy performance certification introduced by the EPBD is the Display Energy Certificate (DEC) which differs from EPCs through displaying the actual energy usage of a whole building rather than the theoretical calculation that an EPC provides.

There is currently limited engagement with DECs in the commercial sector, where they are not mandated. This is due to the present methodology making it difficult for landlords to obtain high DEC ratings despite implementing extensive energy efficiency measures. For example, 80% of leading commercial property owners, trialling use of DECs, found their buildings achieved only the lowest 'G' rating[124].

There have been other concerns raised about DECs that need to be overcome for successful uptake in the commercial sector. For example, they were originally designed for public buildings with significantly different occupancy characteristics than the commercial sector and use only a single 'normalisation' factor to account for such differences in occupancy levels and hours. In addition, DECs exclude separately metered energy for spaces such as trading floors and server rooms which are typical of commercial property.

The dataset used to establish ratings bands for DECs therefore appears to not only be out of date but also based upon a limited number of building case studies[125]. The thresholds for DEC ratings may therefore be inappropriate for use in the commercial-rented sector. As proposed earlier in section 3, data for commercial properties needs to be collected on a wider-scale to allow for more effective use of DECs as a benchmarking tool in the future.

6.2.2.1 Government leadership

The Government should use its considerable 'soft power' as a large property owner and occupier, to demonstrate the relevance of energy efficiency. Lessons can be learned here from other countries, for example, the National Australian Built Environment Rating System (NABERS) 6-star rating, administrated by the State Government of New South Wales (NSW)[126].

NABERS has provided a common language for property owners to communicate effectively with the NSW Government. The Government was able to use its position as a major commercial tenant to drive take up of the scheme by requiring buildings it occupied to have a minimum 3-star rating understandable by all landlords[127].

123 Jones Lang LaSalle (2012) 'A Tale of Two Buildings: Are EPCs a true indicator of energy efficiency?'
124 Better Buildings Partnership (2012) 'BBP Position Paper: Voluntary DECs and Landlord Energy Certificates'
125 Ibid
126 http://www.nabers.gov.au/ [Accessed 15 October 2013]
127 NABERS (2013) 'NABERS Strategic Plan 2013 – 2018: Built on Performance'

The UK Government could use its position to help the market recognise the importance of high-performance commercial buildings by proactively leading on the highly visible enforcement of Display Energy Certificates (DECs) for all public buildings.

Recommendation 11

The Government should visibly enforce DEC legislation for its own buildings to demonstrate the importance of sustainable buildings.

6.2.2.2 Providing policy certainty for commercial landlords

Whilst the enforcement of commercial-sector EPC regulation in 2018 is welcomed, it is vital that the property industry be engaged with fully to help it smoothly navigate the long-term 'regulatory curve' in future. The Government should seek to avoid sudden regulatory shocks, as exemplified by DCLG's decision not to include 'consequential improvements' in the domestic Green Deal despite 82% of respondents being in favour of this proposal in a recent consultation on changes to building regulations[128].

It would be helpful if the Government consulted with the wider property industry to produce an industry routemap, similar to the 'Low Carbon Routemap for the Built Environment' produced through the Green Construction Board[129]. This could provide the property industry with the confidence it needs to invest for the long-term in the energy performance of commercial buildings.

Recommendation 12

The Department for Communities and Local Government should work with commercial landlords to establish a clear industry routemap for future increases in energy performance standards, for example EPCs & DECs, for commercial buildings.

6.3 Increasing demand for energy efficiency in commercially-owned buildings

As has been outlined earlier in this section, there are several regulatory drivers providing limited impetus to commercial property owners to invest in improving the energy performance of their buildings. Demand from occupiers is needed to provide additional incentives for such owners to invest in increasing the energy efficiency of buildings. However, there are several barriers for landlords and occupiers that prevent them investing in energy efficiency explored further below.

6.3.1 Landlords preserving the core value of commercial property

As discussed in section 3, improvements in energy performance are typically not valued very highly by many organisations in the commercial sector. Property agents evaluating commercial buildings for the purposes of future investment by landlords and external investors look to increase profit margins through maximising the value of the rent yield of their property portfolios. This is ultimately determined by a landlord's ability to let

128 Department for Communities and Local Government (2012) '2012 consultation on changes to the Building Regulations in England'
129 http://www.greenconstructionboard.org/images/folder/GCB_Carbon_ROUTEMAP.pdf [Accessed 1 October 2013]

that property; therefore factors such as the property's location, proximity to transport hubs and ultimately the market-competitiveness of its rent, tend to take precedence in the minds of potential landlords. This strongly influences building valuations. Recent analysis of the weak relationship between EPCs and occupier demand suggests that there is currently little premium placed on buildings with 'green' improvements, such as energy efficiency, by occupiers[130].

6.3.1.1 Negotiating void periods

Making energy efficiency improvements can be a time and resource-consuming activity for many commercial landlords and can severely disrupt an occupier's business activity. For this reason landlords often choose the time between former and incoming tenants taking up leased space, known as a 'void period', to make deep energy efficiency retrofits. As outlined above, preserving the value of commercial property as space available for let is of paramount importance to landlords and can present a significant barrier for take up of energy efficiency if doing so prolongs void periods.

Furthermore, business rates are charged on most non-domestic properties, such as shops and warehousing, when they are empty after an initial three-month rate-free period has expired. Deep energy efficiency retrofits can take longer than three months and the prospect of being responsible for paying such business rates, in lieu of potential tenants, as well as missing out on lost rental income would be very unattractive for many landlords. This further disincentivises them from making energy efficiency improvements.

The Government should therefore provide funding for Local Authorities to increase the length of time that business rate relief is provided for empty (commercial) properties, to twelve months. This would allow landlords to undertake more extensive 'deep' energy efficiency retrofit projects without being penalised. However, this rate relief should be conditional on the property undergoing subsequent Energy Performance Certification to demonstrate such improvements have resulted in raising the property's EPC score to a higher rating band.

This would minimise the risk to landlords in making these types of improvements and would follow a similar type of policy intervention already proposed by DCLG for newly constructed buildings, estimated to be worth over £150 million for the construction sector[131]. Currently, the Government will provide 100% empty property rate relief for around 11,000 newly constructed buildings for up to 18 months after they have been completed[132].

130 Urban Land Institute (2013) 'Green premium or grey discount?: The value of green workplaces for commercial building occupiers in the UK'
131 Department for Communities and Local Government (2013) 'Business Rates: New Build Empty Property – Guidance'
132 Ibid

Recommendation 13

The Government should extend the length of time that landlords can receive empty property rate relief from Local Authorities to 12 months. This relief should only be made available on the condition that energy efficiency improvements are being made on the property and proven by it receiving an increased EPC score.

6.3.1.2 Contractual restrictions

Landlords are also often restricted from making energy efficiency improvements to their buildings, with occupiers 'in situ', as they are often legally only allowed to make significant alterations to areas under their direct control, such as communal areas. In the main, landlords are prevented from making changes to occupiers' demises unless equipment needs replacing. Furthermore, landlords are keen to minimise any losses in rental income through causing disruption to occupiers and this provides a further disincentive, in combination with legal barriers, to landlords making energy efficiency improvements in their buildings.

Implementing energy efficiency or carrying out assessments that will be required for compliance with future EPC regulations, could also cost landlords significantly. When the Government puts forward its proposals for implementing EPC regulation in the commercial-rented sector, it should seek to clarify the responsibilities of landlords to carry out EPC-type assessments and make it clear that occupiers should work with their landlords to facilitate this.

6.3.2 Leveraging occupier demand for energy efficiency

There is evidence that occupiers in the UK, rather than choose buildings with a better energy performance, are instead beginning to avoid poorer performing buildings[133]. This is thought to be reflective of the fact that improved energy performance is reflective of a building's improved aesthetics, a factor that is valued by occupiers[134].

The emergence of such a 'grey discount' is likely to grow in the future, particularly as minimum standards come into force for commercial property in 2018. Schemes aiming to improve the energy efficiency of buildings, such as the Green Deal, have the potential to increase the value of commercial buildings depending on their energy performance. Research produced by DECC has attempted to demonstrate that domestic properties with good EPC ratings command higher house prices, finding that, *compared to dwellings rated EPC band G, dwellings with higher EPC ratings have sold at a statistically significant price premium*[135]. There is reason to believe that this could be replicated in the commercial sector if visibility of occupiers' energy costs can be improved and the full potential of sub and smart-metering fully realised, as discussed below.

133 Urban Land Institute (2013) 'Green premium or grey discount?: The value of green workplaces for commercial building occupiers in the UK'
134 Parkinson, A et al. (2013) 'Energy performance certification as a signal of workplace quality'
135 Department of Energy and Climate Change (2013) 'An investigation of the effect of EPC ratings on house prices'

6.3.2.1 Visibility of energy costs

In many cases, occupiers' energy costs are bundled into building service charges. As outlined in the Low Carbon Workplace Partnership case study later in this section, visibility and understanding of energy costs is crucial to engaging occupiers in investing in energy efficiency. The Government's proposed roll-out of smart meters, currently scheduled to begin in Autumn 2015, is designed to enable this by allowing businesses to more easily see their energy usage and pave the way for the 'intelligent' connection of individual energy systems as part of 'Demand Side Response' in the future.

6.3.2.2 Smart meters

Recent research into attitudes towards smart meters in the SME sector (a key sector to engage in the roll-out) illustrates the importance of installing smart meters on business premises throughout the commercial sector. Awareness of smart meters is currently low amongst SMEs and although when asked, many businesses recognise the merits of smart metering (bill accuracy, real-time energy-use monitoring), there has been to date, low take up. This is due to the perceived benefit of installing smart meters being low amongst SMEs, despite little 'active resistance' to their take up[136]. Moreover many SMEs see smart meters as solely representing a cost, albeit a small one. Increased take up of smart metering could raise the profile and importance of energy in the minds of businesses and would help some to take the next step of evaluating their options for investing in energy efficiency.

Smart meters are currently being rolled-out as part of a wider meter-replacement programme to the non-domestic sector through energy suppliers[137]. However, it is unclear whether businesses will be asked to bear this cost or if suppliers will absorb this cost themselves. For the reasons outlined above, if the Government wishes to see high voluntary take up amongst the SME segment of the commercial sector, it must make implementation virtually 'cost free' for businesses.

Smart meters cannot be included in the Green Deal as they do not provide energy savings directly so do not qualify as a 'Green Deal Measure'. There should however be an accelerated roll-out of smart meters to the non-domestic sector, linked as closely as possible to the non-domestic Green Deal, in order to maximise the opportunity for Green Deal Assessors and Advisers to engage with consumers on early take up of smart meters, particularly in multi-tenanted buildings where businesses may not already be individually metered.

6.3.2.3 Overcoming legal barriers for occupiers

Occupiers can also struggle to benefit from investing in energy efficiency improvements to their premises even in cases where relatively short payback periods are on offer, such as making lighting system upgrades. This is due to most leasing contracts using 'dilapidation clauses' which requires occupiers to return premises to the state they found them in originally. This often means removing any energy efficiency

136 Department of Energy and Climate Change (2013) 'Attitudes towards and experiences of smart meters in the non-domestic SME market'
137 Department of Energy and Climate Change (2012) 'Smart Metering Implementation Programme: First Annual Progress Report on the Roll-out of Smart Meters

improvements made during the term of their contract. In the case of many retrofits, such as the installation of solid wall insulation and even lighting, this is highly impractical and costly for occupiers, overall acting as a strong disincentive to carrying out such improvements.

In addition to void periods, the period during which commercial leases are renewed, and negotiations entered into, also provides a potential 'trigger point' for energy efficiency improvements to be made or at least provision be included for them to be made. However, given the commercial nature of leases, there are often significant tensions between occupiers and landlords both during a tenant's occupancy and especially during lease negotiations.

One key to overcoming the 'split incentive' problem in commercial buildings is to help landlords and occupiers engage more successfully with each other and reduce the hidden costs of undertaking energy efficiency improvements. This type of initiative is often referred to as 'green leasing' whereby provisions for the landlord and occupier to work together to improve the environmental performance of a building are integrated upfront, when lease contracts are negotiated, and provide a baseline for future understanding for each party.

It is important to note that energy performance is often only one of the areas covered by a 'green lease', the others typically include recycling, waste and water management, and conservation of local biodiversity[138]. However, green leases have only achieved significant traction in countries such as Australia. In the UK the LES-TER initiative (Landlord Energy Statement – Tenant Energy Review)[139] is the only scheme to have taken the green leasing concept forward.

6.4 The Green Deal as a solution to the split incentive

The Government's Green Deal scheme is specifically designed to overcome the 'split incentive' problem in both the private and commercial rented sector. The key to the scheme's ability to do this is that a Green Deal Plan, and thus the Green Deal charge, is attached to the energy meter of the Green Deal customer rather than to the property as a whole. The scheme thus allows the customer bearing the costs of installing such measures to fully receive the resultant benefits. Despite this the non-domestic Green Deal faces significant barriers to its widespread take up in large, multi-tenanted buildings.

As also mentioned in this report the scheme's use of the 'Golden Rule' has been questioned throughout the industry, particularly around its ability to take into account future energy use in premises with a Green Deal attached[140]. Similarly, the implementation of a Green Deal in a commercially-owned building might also be unappealing to commercial landlords as it could potentially deter future occupiers from renting their property.

138 Better Buildings Partnership (2013) 'Green Lease Toolkit'
139 http://www.les-ter.org/page/home [Accessed 26 August 2013]
140 UK Green Building Council (2013) 'Green Deal Non-Domestic Round Table'

6.4.1 Overcoming Green Deal 'hassle costs' in commercial property

Implementation of Green Deal measures would also incur 'hassle costs' (such as business disruption) for both occupiers and landlords, and therefore more work is required from the Government to help overcome this barrier. The introduction of a cashback system would be one way of doing this. However, use of this type of incentive would have to be very carefully monitored and limited to specific Green Deal measures to ensure the market does not become dependent on this as a 'Green Deal subsidy'. Furthermore, the presence of 'dilapidation clauses' in commercial leases, as mentioned above, may significantly harm take up of the Green Deal in commercial buildings as Green Deal measures will similarly require removal from occupied space at the end of a tenancy. Clarification from DECC is urgently needed on this issue.

THE LOW CARBON WORKPLACE PARTNERSHIP

CASE STUDY

Aims

The Low Carbon Workplace Partnership (LCW) was launched in 2010 in response to an ever-more stringent low carbon regulatory environment and the perceived shifting of trends within the commercial tenants' market towards a demand for 'sustainability'. LCW is a partnership between Threadneedle Investments UK, Stanhope Plc and The Carbon Trust. The purpose of LCW is to prove the commercial case for low carbon refurbishment of existing office buildings and reduce operational carbon through effective stakeholder engagement and management. In so doing LCW aims to overcome issues that can arise in the typical 'landlord-tenant' relationship and which are often present in many commercial buildings. The founding partners initially committed £30 million in equity and with the addition of third party investors this has now quadrupled in value to £130 million. The equity has been successfully deployed in the purchase of six properties, of which three are fully let, one is near completion and two are in the planning stages.

The Low Carbon Workplace Approach

The key advisors to the LCW Partnership include Low Carbon Workplace Ltd, a wholly owned subsidiary of the Carbon Trust. LCW Limited provides an end to end carbon advisory service throughout the project, assisting the developer and design teams during the design stages, advising at commissioning and handover and working with occupiers during fit-out and occupation to ensure optimum operation of the building as it was intended. Advice is provided to occupiers through the Low Carbon Workplace Charter, a tool designed by the LCW Partnership.

LCW Limited assists occupiers in preparing for the 'Low Carbon Workplace Standard' which is independently certified by the Carbon Trust. This provides a recognised benchmark for low carbon workplaces within commercial buildings, acknowledging the partnership between the landlord and the tenant. The Standard itself consists of a 'Workplace Protocol' that clearly defines principles for both landlords and tenants to follow that address which emissions are measured and which excluded; the required carbon management and governance structure for that building and the qualitative and quantitative metrics that are needed to meet the Standard's requirements. In practice, LCW Limited translates the requirements into practical solutions such as including clearly defined Key Performance Indicators (KPIs) for building managers within the building's Service Agreement. Similarly it may use specific language around the contractual arrangements regarding tenant re-commissioning of services within their demise.

Tenant Engagement

The 'Low Carbon Workplace Charter' agreement avoids the potential inflexibility of oft-cited 'green leases' by underlining the commitment and understanding between tenants and Low Carbon Workplace Ltd, as the landlord's representative, to implement technological measures and behaviours to reduce operational carbon emissions. This is signed by a senior executive from the occupier organisation so that the Charter's principles are carried up to a strategic level within the occupier organisation and strengthens the likelihood of future compliance.

Occupiers are also supported across a wide spectrum of issues such as: strategic vision-setting, localised workplace planning, embedding Carbon Management Systems, and guidance on low carbon procurement. Further, support in maintaining a high level of active 'occupational' carbon management is given through the provision of an in-depth 'Occupier Toolkit' by LCW Limited and access to a 'Carbon Champion' network. Energy and occupancy usage is informed from a sophisticated monitoring system which is installed by the landlord during the base build. Both LCW Limited and the occupier have access to the system which allows them to track their organisational energy-usage on a near real-time basis via the LCW website.

Success/Results

The LCW model addresses both the design aspects of creating low carbon buildings and also the softer elements of engaging stakeholders throughout the process for better building performance. It encourages landlords and tenants to cooperate and benefit from the base build design parameters which maximise the effectiveness of both passive and active energy efficiency measures. In addition to making the most out of a building's natural characteristics such as high ceilings and good thermal mass, the design team will focus on improving performance by upgrading the thermal envelope, introducing a high performance plant, specifying high efficiency lighting, and introducing renewables where appropriate. A 'soft landings' approach is adopted to ensure the continuing engagement of the design teams in the operation of a building and LCW Limited works with maintenance teams and occupiers to continue the good design intent into operation. Whilst performance improvements can be difficult to assess where no previous energy consumption information exists, the stretching targets of the LCW Standard mean that LCW expects each of its buildings to be between 50-60% more efficient than a standard refurbishment.

METHODOLOGY AND STEERING GROUP

Methodology

The inquiry was initiated in May 2013 after a period of initial scoping with the Westminster Sustainable Business Forum's (WSBF) Advisory Board, discussions with WSBF members and desk based research. A range of steering group sessions were held between July and November 2013 to explore issues raised by the research.

The findings and policy recommendations in this report are based on evidence collected from steering group sessions and extensive in-depth interviews and written submissions involving business leaders, central and local government representatives, academics and other stakeholders from the third sector.

Steering group sessions

The findings from the research were scrutinised in a series of four meetings led by the inquiry co-chairs Lord Whitty and Oliver Colvile MP. Expert witnesses from the Department of Energy and Climate Change (DECC) were also invited to attend one of the steering group sessions.

Steering group members

Philip Arend & Sally Harrison	Strategic Liaison Executive & Strategic Development Manager, Carillion plc.
Stephen Barker	Head of Energy Efficiency & Environmental Care, Siemens plc.
Joe Blaisdale & Chris Hunt	External Affairs Manager & Development Project Manager, British Board of Agrément
Paul Davies	Partner, PwC
Martin Gibson	Principal Consultant, Temple Group
Zack Gill	Energy Solutions Engineer, Willmott Dixon
Dr Katy Janda	Senior Researcher, Environmental Change Institute, University of Oxford
Phil Kirby	Director, Policy Connect
Will Ray	Head of Energy Design Centre, Rockwool
Paul Reid	Edge Architecture and Design
Neil Schofield	Head of External and Governmental Affairs, Worcester Bosch
Paul Worland & Richard Mercer	Business Development Directors, EMCOR

Expert Witnesses

David Purdy	Director, Energy Efficiency Deployment Office, Department of Energy and Climate Change
Richard Mellish	Deputy Director (Programme Delivery), Green Deal, Department of Energy and Climate Change

Secretariat

Rachel White	Manager, WSBF & Head of Sustainability, Policy Connect
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GLOSSARY OF TERMS

Carbon budget
A carbon budget is a legally-binding restriction on the total amount of greenhouse gas emissions that the UK can emit over a five year period monitored between 2008 and 2050, having been introduced in the Climate Change Act 2008.

Collateral value
This is the value of an asset that is used as loan collateral and in this report refers to the value of an energy efficiency asset to the lender of finance used to install such an asset, for example a more efficient lighting system.

Commercial sector
This report defines the commercial sector as encompassing all organisations in the wider non-domestic sector that are not otherwise classed as public-sector or industrial organisations, typically those that carry out their business activities in offices and retail space.

Demand side response
Demand side response refers to changes consumers make to their energy use in response to some form of signal, such as a price or electronic message, that help to reduce energy demand. The take up of smart meters will help this to be done remotely using an 'intelligent' computer system.

Dilapidation clause
The term 'dilapidation' refers to the condition of commercial property during the term of a tenancy or when the lease ends. A dilapidation clause is commonly inserted into a commercial leasing contract and requires the tenant/occupier to ensure that the property is returned to the state it was in at the beginning of the lease.

Economies of scale
This report refers to economies of scale in terms of aggregating and increasing the demand for energy efficiency retrofit projects locally to allow energy efficiency suppliers to lower the overall cost of supplying such projects in that area.

Energy efficiency retrofit
Energy efficiency measures typically used to reduce energy consumption in commercial buildings including measures applied to the building fabric of commercial property such as: insulation; energy efficient lighting; installation of side-measures such as building automation controls; and use of behaviour change programmes for workers in commercial buildings.

Energy Performance Contract (EnPC)
An Energy Performance Contract is defined in this report using the European Commission's definition: a contractual arrangement between the beneficiary and the provider of an energy efficiency improvement measure, where investments in that measure are paid for in relation to a contractually agreed level of energy efficiency improvement.

Energy Service Company (ESCo)

For the purposes of this report the definition of an Energy Service Company is adapted from the European Commission definition: a company that delivers energy services and/or other energy efficiency improvement measures in a user's facility or premises, and accepts some degree of financial risk in so doing.

Greenhouse Gas (GHG)

A greenhouse gas is a gaseous chemical in the atmosphere that absorbs and emits thermal radiation within the thermal infrared range and is a key component of global climate change. This report also refers to 'equivalent carbon dioxide' to describe the degree of 'global warming potential' a given type of greenhouse gas may have, using the functional equivalent of carbon dioxide as a reference. Greenhouse gases include carbon dioxide, carbon monoxide, methane and nitrous oxide.

Internal Rate of Return (IRR)

An indicator often used to calculate capital budgets, and when comparing one or more potential projects, for capital investment by a company. Broadly speaking the internal rate of return represents the discount rate applied at which the net present costs equal the net present benefits of an investment, hence the higher the rate, the more favourable the investment.

Key Performance Indicator (KPI)

Many organisations continuously measure their performance, for example progress towards a set of specific goals. A Key Performance Indicator is one type of performance measurement and in this report it is used to discuss goals set for individuals responsible for a building's energy management.

Kilotonnes of oil equivalent per year (ktoe/yr)

Energy production and consumption refers to the supply and demand of different forms of energy, for example oil, coal, gas, and electricity from renewable sources and is converted to a kilotonne of oil equivalent for direct comparison. This is based upon a tonne of oil having a net calorific value of 41,686 joules per kilogram (J/Kg).

Kilowatt hour (kWh)

A kilowatt hour is a unit of energy equal to 1000 watt-hours or 3.6 megajoules, used to describe energy use over a particular period of time.

Large enterprise

There is no specific definition for a large enterprise, however this report has defined a large enterprise as being any which do not fall into the category of small and medium-sized enterprises i.e. more than 250 employees and either a turnover of more than €50 million or an annual balance of more than €43 million.

Megawatt hour (MWh)
A megawatt hour is a thousand times the size of a kilowatt hour
e.g. 1kWh = 1,000 MWh.

Memorandum of Understanding (MoU)
In this report a Memorandum of Understanding is a framework setting out the governance, common vision and objectives between occupiers, landlords and contracted parties involved in the management of a building's energy management.

Micro-business
Micro-businesses are a sub-category of the European Commission's definition of small and medium-sized businesses and are an enterprise with less than 10 employees and either a turnover or annual balance of less than or equal to €2 million.

Small and Medium-sized Enterprises (SMEs)
This report uses the European Commission's definition of a small and medium-sized enterprise: an enterprise with less than 250 employees and either a turnover of less than or equal to €50 million or an annual balance of less than or equal to €43 million.

Terawatt hour (TWh)
A terawatt hour is a million times the size of a kilowatt hour
e.g. 1kWh = 1,000,000 TWh.

Notes

ABOUT THE WESTMINSTER SUSTAINABLE BUSINESS FORUM

The Westminster Sustainable Business Forum (WSBF) is a high-level coalition of key UK businesses, parliamentarians, civil servants and other organisations, seeking to promote effective sustainability policy in the UK.

The WSBF brings together leading UK businesses who want to maximise business opportunities in the transition to a low-carbon economy and share a belief in the need to operate in an environmentally, socially and economically sustainable way. We publish authoritative research reports; impact on government policy through in-depth round table policy discussions and outputs; and inform the wider sustainability debate by convening Parliamentarians, senior civil servants, business experts and other stakeholders at larger policy events and seminars.

The WSBF campaigns in the policy areas of sustainable construction, sustainable infrastructure, water, sustainable planning, green finance and natural capital. We are independent, cross-party and not-for-profit.

With special thanks to Peter Barrett, Leonie Enders, Sophie Hutchinson and Laura Owen.

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