Green premium or grey discount?

The value of green workplaces for commercial building occupiers in the UK

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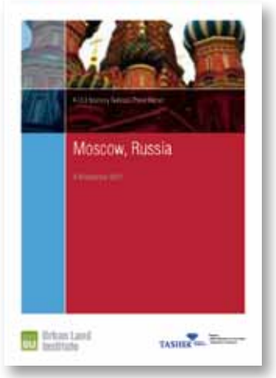
About ULI

ULI – the Urban Land Institute – is a non-profit research and education organisation supported by its members. Founded in Chicago in 1936, the Institute now has over 30,000 members in 95 countries worldwide, representing the entire spectrum of land use and real estate development disciplines and working in private enterprise and public service. In Europe, we have around 2,000 members supported by a regional office in London and a small team based in Frankfurt.

ULI brings together leaders with a common commitment to improving professional standards, seeking the best use of land and following excellent practices.

We are a think tank, providing advice and best practices in a neutral setting – valuable for practical learning, involving public officials and engaging urban leaders who may not have a real estate background. By engaging experts from various disciplines we can arrive at advanced answers to problems which would be difficult to achieve independently.

ULI shares knowledge through discussion forums, research, publications and electronic media. All these activities are aimed at providing information that is practical, down to earth and useful so that on-the-ground changes can be made. By building and sustaining a diverse network of local experts, we are able to address the challenges facing Europe's cities.



Cover image: Office Slice by Christine Vaufrey. Source Flickr.

Preface

Over the last 25 years Stanhope has completed over £10 billion of property developments, the majority of which are office developments in London and the South East. From the outset the social, environmental and economic impacts and performance of our developments has been very important to us.

For buildings to stand the test of time they must be attractive to investors, occupiers and the local communities in which they are built as well as being efficient to build and operate both in terms of cost and the use of natural resources.

We commissioned this research with ULI to help us get a greater appreciation of what occupiers think about the sustainability aspects of their workplaces.

Whilst we have reservations about the benefit of Energy Performance Certificates as a proxy for wider environmental performance, it is interesting to note the close correlation from the survey between EPC ratings and occupier satisfaction with environmental performance.

Although there remains little evidence of the link between value and environmental performance this survey re-confirms our view that the environmental performance of office developments needs to be carefully considered from the outset of a development and should be supported by a closer relationship between owners, occupiers and the operators of office buildings to improve performance in use. If improved environmental performance is an outcome that is shared by owners, occupiers and operators then this will be helped by the sharing of meaningful information on how buildings are actually performing in use.

We hope this survey will help highlight the need for this to take place.

Rob Watts, Development Director, Stanhope plc.

Acknowledgements

Several organisations made this project possible. We would like to thank: Stanhope for funding this project, the Centre for Sustainable Development at Cambridge University Engineering Department for conducting the overarching research, CoStar® for providing the building rental data and the Low Carbon Workplace Limited for supporting the development of the research.

We would also like to thank the leading UK building sustainability initiatives who all played a crucial role in delivering the survey: Low Carbon Workplace Limited, Modern Built Environment Knowledge Transfer Network (MBEKTN), UK Green Building Council, 2 Degrees Network, Open City, Planet Positive, EcoConnect, Better Buildings Partnership, British Institute of Facilities Management (BIFM) and the Cambridge Programme for Sustainability Leadership (CPSL).

Executive Summary

The real estate sector has made some progress in responding to the need to reduce energy consumption and developing a low carbon economy. Factors such as increasing resource costs and social demand mean that the sustainability of commercial buildings is becoming an increasingly important consideration for building occupiers. Regulation and legislation have also played a key role, not least in the emergence of Energy Performance Certificates (EPCs) which are currently the only statutory instrument for communicating the sustainable quality or benefits of a building to prospective or current occupiers. EPCs provide buyers and renters with a clear, vivid, and simple signal of facility quality.

Taking EPCs as a core indicator, this research:

- evaluated what occupiers of the UK office market thought about the sustainability of their workplaces;
- identified their expectations for sustainable workplaces in the future;
- determines if more sustainable buildings yield higher rental value; and
- highlighted the potential implications for commercial building owners and managers.

Our findings suggest that building occupiers were very interested in improving their workplace sustainability and are clear that building sustainability will rise in importance in the future. Occupiers believe that the most significant challenges to providing quality workplaces in the future will be the availability of affordable interventions. This suggests that many of today's solutions for occupier sustainability are priced too high or organisations have limited budgets available to improve the sustainability of their workplaces.

It is important to understand what drives behaviour change in organisations. Despite staff or board members being viewed as the key drivers of workplace sustainability to date, the research indicated that in the future this is expected to change. Instead, shareholders, trustees and customers (price takers) will be instrumental in driving initiatives in the years to 2030. It is the attitudes of the price takers that have been identified as key in driving sustainability towards 2030. Therefore we might expect to see a shift in the drivers for sustainability in the workplace, from within the firm to the marketplace.

Occupant attitudes towards the environment were found to have had no historic impact on rental premiums. Rental value was found to be an invalid measure of an occupier's satisfaction with their facility, as there was no association for any attribute other than workplace aesthetics. This suggests that there has been no 'green premium' for UK commercial buildings in relation to rent.

The results of our study suggest that there has been no value in 'green' to date because UK property firms may not be providing prospective occupiers with information that effectively signals how a facility will satisfy their interests and desires on occupation. This could change in the near future. EPCs are often seen as a weak indicator of environmental performance; however this research indicates a connection between occupier satisfaction and EPC rating. EPCs were found to provide valid indicators of expected holistic occupier satisfaction for occupiers, agents and building owners of facilities. Such a signal could be very useful for communicating facility qualities that could be used for price differentiation.

There is also a case for property firms to engage more closely with their occupiers, to gain a better understanding of their interests and desires, and provide a more satisfactory service. This and other key recommendations around performance reporting and improving engagement between occupiers and building owners are contained in the conclusion to this report.

Contents

1. Introduction

Buildings account for around 40%[1] of the world's energy use. Many of today's buildings will still be in existence in 50 years' time. There is therefore increasing pressure on building owners, managers and occupiers to reduce the overall demand for energy in buildings. This is already happening, both as a result of regulatory pressure and economic opportunity to manage resources efficiently. However, as cities currently account for 75% of the world's energy use[2] and the demand for energy continues to increase, so will the necessity for countries to manage energy more efficiently.

In 2002 and 2010, the European Union (EU) introduced legislation requiring member countries to engage building owners and occupiers in understanding the efficiency of their buildings through Energy Performance Certificates (EPC) (box A). In response, the UK Government introduced the Energy Performance of Buildings Regulation 2007, which requires all buildings being constructed, sold or leased to include an EPC.

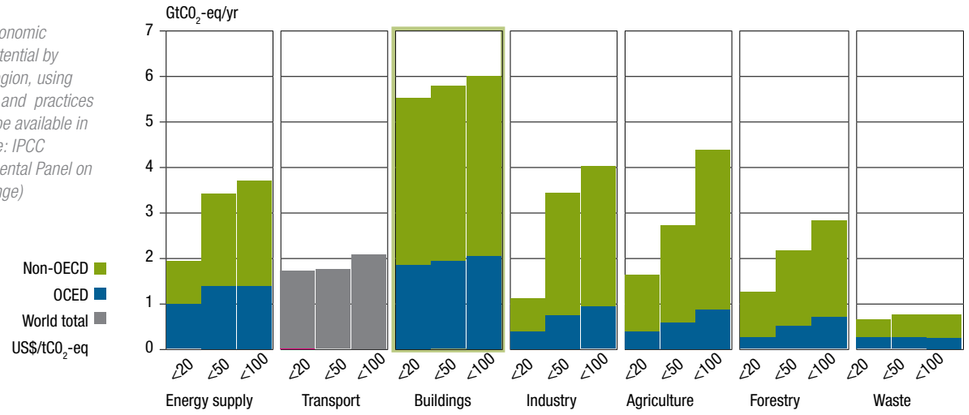


Figure 1. Estimated economic mitigation potential by sector and region, using technologies and practices expected to be available in 2030 (source: IPCC Intergovernmental Panel on Climate Change)

Buildings have been predicted as the sector with the biggest economic mitigation potential for achieving future energy reductions (figure 1). Occupier engagement alone has been recognised as being able to deliver up to 20% energy consumption reductions[3], yet overall energy use continues to rise, leading to the need for Government to introduce legislative controls.

Even with current legislative pressure many organisations are not grasping the potential energy savings for the buildings they occupy. Cambridge University's Energy Efficiency in the Built Environment (EEBE) project defined 6 interlinking common barriers as to why this may be (figure 2). For example, while emerging technology may be able to provide solutions, lack of incentives, no standardised building energy measurement and an absence of stringent regulation, limit improvements to building energy efficiency. In reverse it has also been identified that improvements within any of the 6 barriers will also have a knock on effect in other barriers.

Each additional US$1 spent on energy efficiency in electrical equipment, appliances and buildings avoids more than US$2, on average, in energy supply investments

United Nations, The future we want, Energy, June 2012

[1]*International Energy Agency, Policy Pathway, Energy Performance Certification of Buildings 2010*
[2]*United Nations Department of Public Information, Fact Sheet: The future we want, Energy, June 2012*
[3]*2degrees, Cushman and Wakefield, Delivering Building Energy Efficiency Through Behaviour Change 2012 p5.*

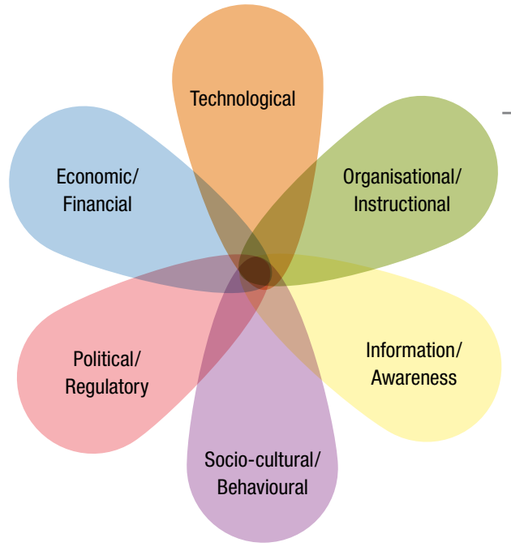


Figure 2. Common barriers to building energy efficiency from Cambridge University's Energy Efficiency in the Built Environment (EEBE) project

Box A: Energy Performance Certificate (EPC)

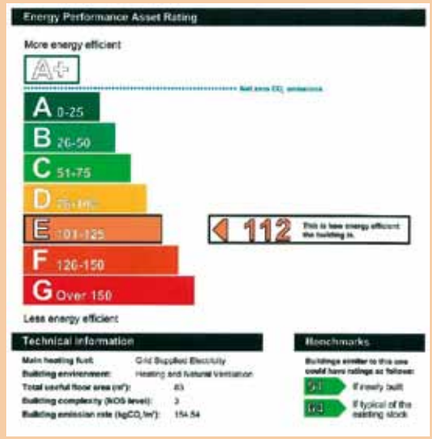
EPCs were introduced in the UK in 2007 as a result of the EU Energy Performance of Buildings Directive of 2002 to promote sustainability, encourage efficient energy use and provide occupiers with energy and carbon consumption information.

An EPC rating is mandatory for a constructed, sold or let buildings and can be for the whole or part of a building. The building being assessed can have more than one tenancy as well as different uses or sub-lettings. Overall, the EPC rating certificate must reflect the energy being used by the space offered.

EPCs are produced by assessors who inspect building comparing floor size, occupier numbers, amongst other key features such as the electrical appliances used. These can include loose insulations, boilers, water tanks, radiators, air conditioning appliances, lighting etc, which are then inputted into a computer programme. The programme calculates the energy efficiency of the building and provides a rating of this efficiency based on an A to G performance, where A is highly efficient and G is the worst performing. The certificate therefore provides a tool for providing general recommendations for improvements for saving money and reducing the buildings carbon footprint. The accuracy of these recommendations varies and depends on the standards of the inspection.

EPC regulation was updated 6th of April 2012 and it is now a requirement to provide building EPCs to prospective buyers or tenants when they are viewing a property or when a request to view a property has been made.

EPCs are intended as a comparison to raise people's awareness of building energy and carbon. However as the importance of efficiency and carbon increase EPCs are often criticised as not being accurate enough and that a more stringent evaluation would create more impetus and incentive for buildings to be more efficient.



Sample E rated Energy Performance Certificate

Rationale for the research

'Buildings don't use energy, people do'

LessEn roundtable participant

While regulation controlling energy consumption is growing, there is limited evidence on its impact on commercial occupiers or building owners. Discussions at the Urban Land Institute's LessEn initiative suggest that many building owners consider occupiers as consumers of facilities, but tend not to look to occupiers to effect building energy improvement. However, changing occupier behaviour provides one of the largest energy saving opportunities in a building.

This research therefore focuses on exploring:

- occupier understanding of current and future building sustainabilit;
- whether more sustainable buildings offer higher value (see below) to occupiers in terms of satisfaction;
- whether a 'green premium' exists for more sustainable buildings;
- if a 'grey discount' is associated with occupier satisfaction and rental value.

'The key is to create a great workplace first and then make it energy efficient'

LessEn roundtable participant

Definition of value

For the purpose of this research:

- Facility quality, has been determined through measuring occupier satisfaction within their workplace in relation to building performance based on a range of theorised criteria established through a literature review;
- Purchase intentions have been determined by a facilities rental value;
- Holistic quality of a facility is not a definition of property value and more related to a properties worth.

How the research was undertaken

The Urban Land Institute's LessEn initiative in partnership with Low Carbon Workplace Ltd and Cambridge University developed a research project to determine the 'value of green workplaces'. The project's methodology was based on a survey, primarily aimed at UK commercial office occupiers and in particular, the London office market (figure 3). Occupiers were asked to share their views for:

- drivers for engagement in sustainability;
- current and future investment in sustainability;
- sustainability reporting frameworks;
- satisfaction with building attributes (appendix);
- levels of engagement with their landlords;
- future organisational changes;
- future barriers to occupier sustainability.

Premier House Low Carbon Workplace before and after.
See Case Study on page 18

The survey was conducted between November 2011 and April 2012, resulting in 204 responses of which 78% respondents were London based. The sample size is limited and may not be representative of the entire UK office market; however, the analysis found the data collected to be highly reliable and with a reasonable degree of validity, meaning that robust conclusions could be drawn from statistically significant results. The information was then analysed to determine the relationships between:

- occupier satisfaction of their workplace building;
- rental value;
- organisational environmental performance.

Data on rent levels was provided by CoStar® and UK EPC data was utilised to determine the building efficiency performance. This report presents the main findings of the research.

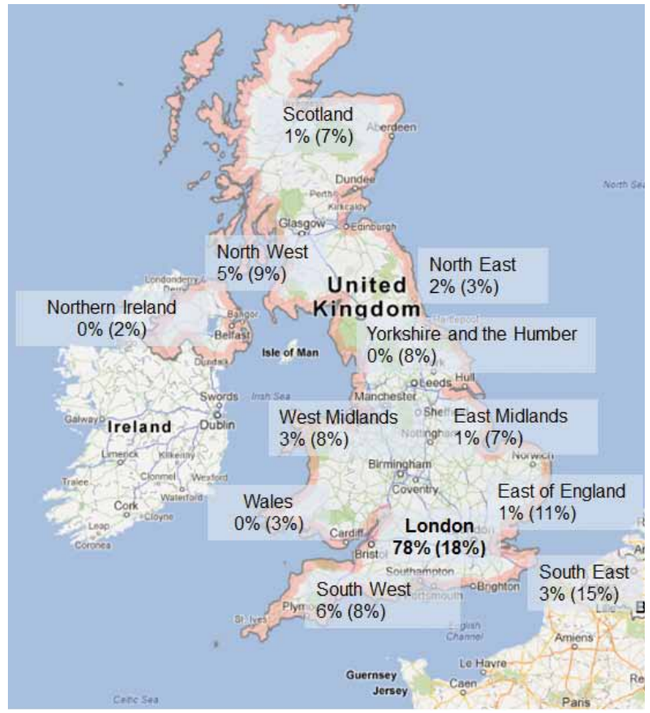


Figure 3.
Survey respondents across the UK (in comparison to national working population)

2. What occupiers think

Drivers for engagement in sustainability

Engaging building occupiers improving their sustainability can be a significant challenge. This research indicates that the most substantial driver for occupier sustainability currently comes from within an organisation. Staff and board members were found to be the most important drivers of sustainability (figure 4). So if building owners or property managers would like to improve their overall building or portfolio performance, occupier engagement should be an integral part of their focus.

External influences such as Government policy, energy prices and customers were identified as secondary influences on improving organisations' approaches to sustainability. This indicates that sustainability is also important for organisations if they are to retain or attract customers and that energy prices as well as government policy are prompting occupiers to address sustainability.

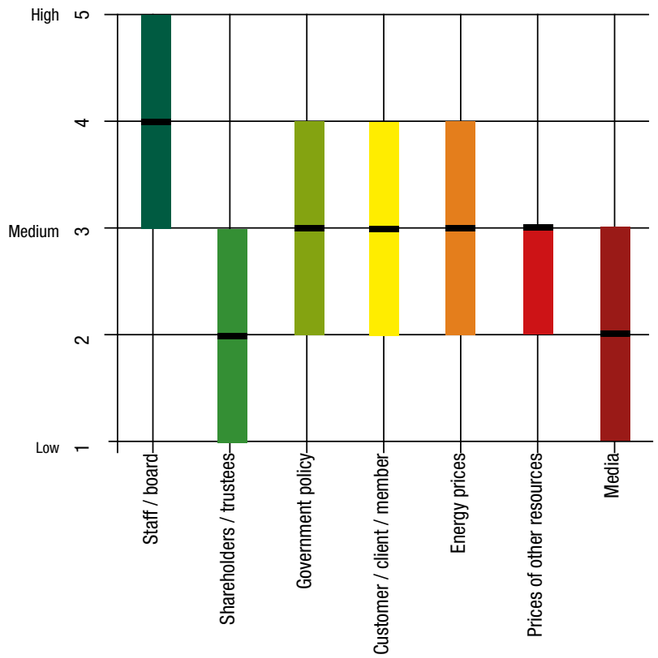


Figure 4.
Current drivers for occupier sustainability

Current investment in sustainability

Most occupiers believed that their organisations were not spending enough to improve sustainability within their organisations (figure 5). Organisations spend the most on energy efficiency and waste (recycling and waste to landfill), which could relate to growing regulation.

Embodied carbon, embodied energy (see box B) and ecology were found to attract the least investment, which may be a result of limited requirements for organisations to report on such factors. As the need to address global greenhouse gas emissions increases, and the UK seeks to meet its 34% greenhouse gas reduction target by 2020, there is a need to better understand how buildings and therefore occupiers play their part in meeting this reduction target.

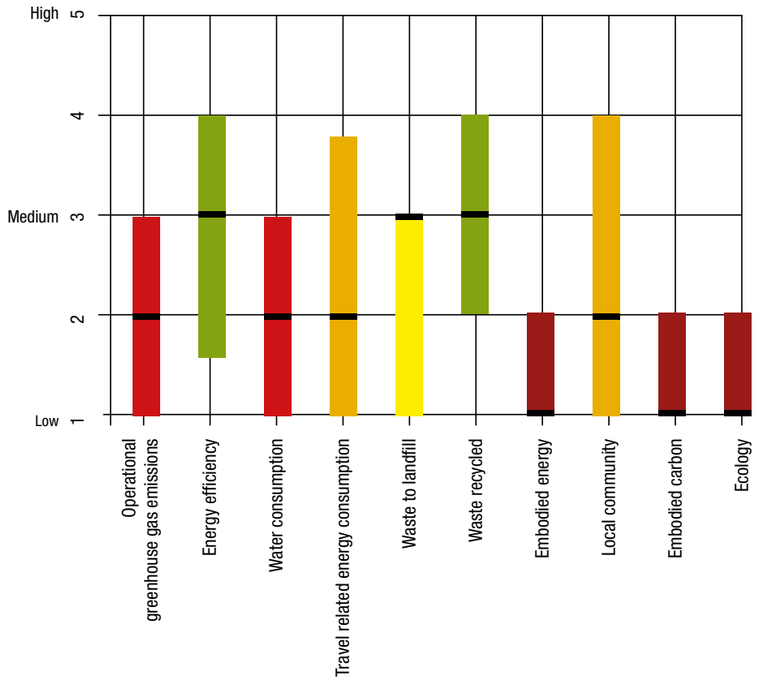


Figure 5.
Occupier perceptions of organisational investment

Box B: Embodied energy, embodied carbon and operational carbon

Embodied energy and embodied carbon

Creating, transporting, selling and delivering a product or service utilises energy and it is the collective energy that these processes use that makes up embodied energy. Embodied carbon is therefore the total carbon dioxide emissions that are created through this same process.

For example in buildings this would relate to how much energy used or carbon is emitted creating the physical aspects of a building or product.

Embodied energy is the energy consumed by all of the processes associated with the production of a building or product, from the acquisition of natural resources to product delivery, including mining, manufacturing of materials and equipment, transport and administrative functions.

Operational carbon

Operational Carbon denotes the emissions associated with heating, cooling, lighting and meeting the power needs of a building or work space.

Importantly whilst in the past EU and UK legislation always focused on operational carbon, this is changing, with all publicly listed companies in the UK, required to report their carbon emissions in 2013. There have also been discussions of introducing whole life reporting (combination of operational and embodied carbon) in the near future.

The whole life reporting introduces some interesting new relationships, such that if you are using materials to reduce your operational carbon footprint you also need to consider the additional burden this may be creating on your embodied carbon side.

Future investment in sustainability

Respondents identified the following factors as having the strongest influence on the levels of occupier investment in sustainability in the period to 2030:

- staff;
- Government policies;
- energy prices;
- prices for resources.

The respondents identified that towards 2030 the key drivers for sustainability within their organisations, which were most uncertain and had the highest impact, would derive from consumer and shareholder markets, and not from within an organisation as seems the case currently (figure 6). Managing the risk of consumers and shareholders for organisational sustainability will require businesses to take an active role in raising the importance and accountability of sustainability amongst these groups. Many organisations are already reporting their sustainability, yet buildings are often not included in sustainability reporting systems.

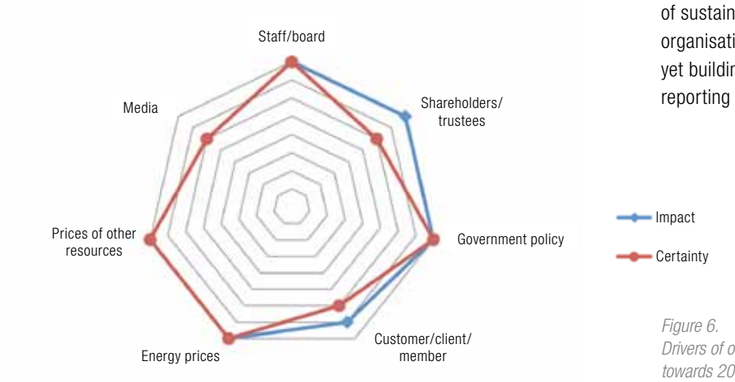


Figure 6.
Drivers of occupier sustainability towards 2030

How occupiers report sustainability

In response to depleting natural resources, governments have applied legislation requiring organisations to improve reporting on energy, carbon and resource efficiency. Organisations have developed different frameworks for reporting their performance in this area. This research found that the majority of responding organisations report their sustainability performance through a) corporate social responsibility (CSR) systems and b) the International Organisation Standardization (ISO) framework (figure 7). These frameworks are used by organisations to report primarily on overall environmental performance, incentivising performance improvements across the entire organisation. However most of these corporate environmental reporting systems provide limited information on individual building performance. This suggests that many occupiers are not reporting their building performance to their shareholders or customers.

Monitoring and reporting frameworks that include information on individual building performance, such as the Carbon Reduction Commitment (CRCEES), BREEAM, Carbon Trust Low Carbon Workplace Standard and Display Energy Certificates (DEC) were being utilised by occupiers but their use was significantly lower than the sustainability reporting described above. As the need to meet national and global carbon targets increases, occupiers will be increasingly required to demonstrate that they are meeting and preparing for current and emerging energy and carbon legislation (discussed in more detail later in the report).

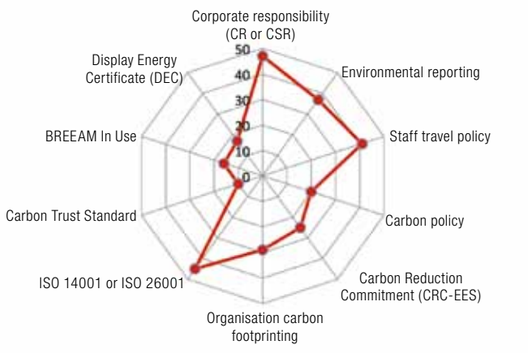


Figure 7.
Organisational sustainability reporting systems

Building owners, managers and investors

Commercial building types vary significantly across the UK. Comparing building standards can therefore be a complex challenge. One of the most common commercial office building grading systems is the Building Owners and Managers Association (BOMA) three class classifications (box C). Grade A, B or C rating does not differentiate between buildings that are more or less sustainable and occupiers are often required to undertake extensive research to fully understand the sustainability benefits of one building over another.

Building labelling and certification schemes are intended to address these challenges by providing buyers with a clear, vivid, and simple signal of facility quality. EPCs are currently the only statutory instrument for communicating the sustainable quality or benefits of a building to prospective or current occupiers.

This research has found that people made decisions to occupy a building, selected their workplaces based on location and aesthetics rather than high sustainable qualities (figure 8). Other, less apparent qualities of office facilities have not had a significant effect on purchase intentions.

Box C: BOMA Building Classification

Grade or Class	Characteristics
A	'Premium' quality buildings in a prime location, accessibility and often attract rent that is above average for the area.
B	Buildings that are not always in a prime location but offer a good or fair standard of facilities. The fit-out of such buildings is usually functional and typically offer market rate rent and are more readily available.
C	Average to low quality buildings that offer functional space, often outside of main transport or city areas, with decoration and finishings that are often not maintained at a high standard. Rental premiums for grade C buildings are usually below market average.

Location is the most important factor and we then put a plan in place to bring the building up to standard.
LessEn Roundtable participant

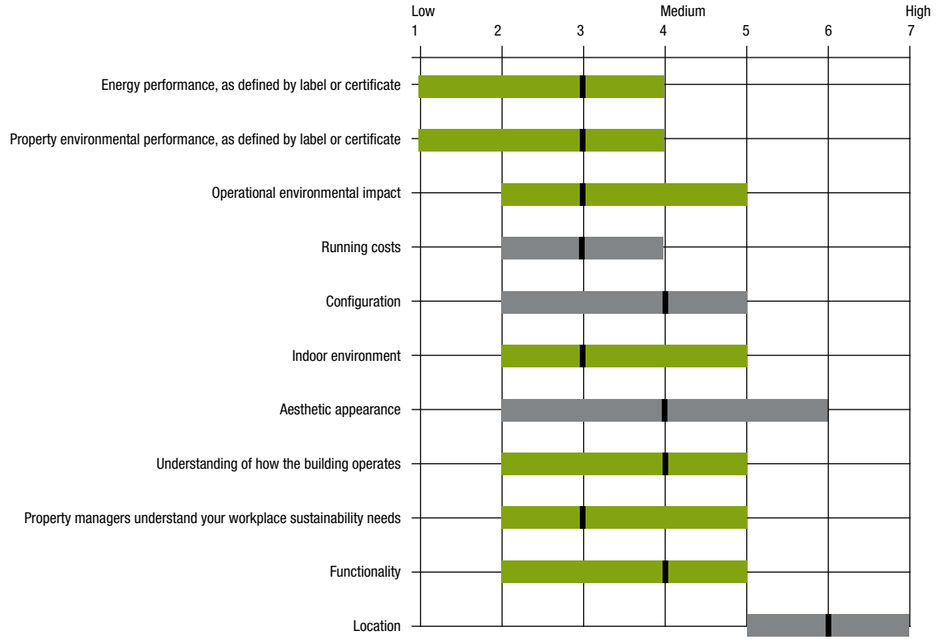


Figure 8.
Occupier satisfaction of their workplace sustainability

Do green premiums exist?

UK buildings offer a 'grey discount' not a green premium.
LessEn Roundtable participant

To determine if there is evidence to support this claim, we assessed the relationship between overall occupier satisfaction, building rent and EPC rating. Rental value was found only to have a correlation with occupier satisfaction of building aesthetics. Environmental performance was found to have no impact on rental premiums (table 1).

This indicates there is no evidence of a 'green premium'. Interestingly EPCs were, found to have a positive correlation with all aspects of occupier satisfaction.

EPCs are regarded by the real estate industry to be a weak indicator of environmental performance. However our research suggests they are a strong indicator. Their value in relation to occupier satisfaction with their facility could be seen by occupiers, agents and building owners as an indicator of facility quality and could be further used for price differentiation. The complicated relationship between price and changing occupier desires is explored in box D.

The results of our study suggest that there has been no value in 'green' to date because property firms might not be responding effectively to changing occupier interests and desires. But the latter are likely to be subject to rapid change over the next few years. There is therefore a case for property firms to engage more closely with their occupiers, to gain a better understanding of changing desires.

Hollywood House - see case study on p.19

Factor	Satisfaction scale item / Building facility attribute	Correlation rank	
		EPC Asset Rating	Rental Value
Building Facility Costs	Energy performance, as defined by label or certificate	***	
	Environmental performance, as defined by label or certificate	***	
	Operational environmental impact	***	
	Running costs	***	
	Property managers understand workplace sustainability needs	**	
Building Utility	Configuration	**	
	Indoor environment	**	
	Aesthetic appearance	*	*
	Functionality	*	

Table 1. Occupier satisfaction correlation with building attributes, EPC and rental value

*Key: * <5% probability of correlation (or association) occurring by chance.*
*** <1% probability of correlation (or association) occurring by chance.*
*** <0.1% probability of correlation (or association) occurring by chance.*

Box D: Price, the property market and the green agenda

In economic theory, price is a useful signal of what a person or organisation is prepared to pay for an item rather than do without it. In a market economy, in addition to the quantity of goods available, a range of factors including interests, buyers' incomes and the availability of related goods affects the price buyers are willing to pay.

One of these external influences is the growth in importance of sustainability and the move to a low carbon economy. New regulation and shifts in attitudes have led to greater demand for more sustainable buildings. As new interests and desires develop, we would expect to see higher prices emerging for buildings which are more sustainable.

But, as the above discussion demonstrates, our survey found no rise in rental price for those offices with better energy efficiency as measured by EPCs. Why is this? This disconnect between price and quality of product can be explained by various factors such as location demand, land value, building quality and occupier values. The Better Buildings Partnership have developed a series of tools for engaging occupiers and agents in delivering more sustainable buildings. **www.betterbuildingspartnership.co.uk**.

The insertion of brokers between the buyer and seller in most property deals leads to a distorted market as the agent is incentivised to obtain the highest rental value possible by receiving a percentage of the agreed price. In these cases, price is not therefore always a good reflection of quantity or quality of goods or of occupier desires or interests.

Certification as an indicator of occupier satisfaction

It is difficult to measure occupier satisfaction within a workplace. This research has shown that the strategic potential of EPCs in the UK office market is highly significant, as they are associated with all attributes of occupant satisfaction in commercial buildings (see table 1). This could indicate that developers and building owners, who refurbish or create buildings to a high sustainability standard, are also aware of broader occupier satisfaction requirements of a building. Figure 9 shows that as the building EPC level rises so does the overall satisfaction of the occupier. This would also indicate that the value of satisfied occupiers, in terms of a building's EPC rating should be more highly regarded by building owners and investors if they are to retain their occupiers.

Occupiers of F and G rated buildings were found to be least satisfied with their buildings indicating a 'grey discount' exist for lower EPC rated properties.

Future UK legislation will prevent F and G rated buildings to be let, indicates that F and G rated properties will need to be improved to meet higher EPC standards (see 'Preparing for the future' in the later part of this report for further details).

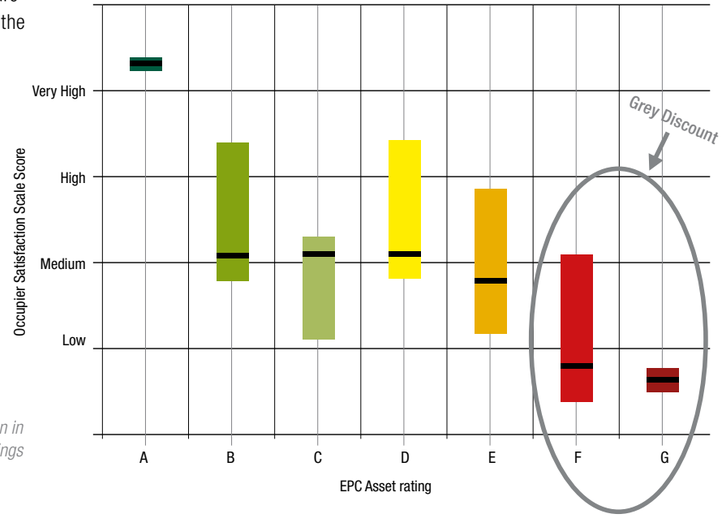


Figure 9. Occupier satisfaction in relation to building EPC ratings

3. Raising occupier satisfaction through engagement

Significant differences in occupier satisfaction were found where property managers were more engaged with their occupier sustainability needs depending on their tenancy arrangements. Our study found that occupiers were:

- Least satisfied when a tenant in a multi-let building and often had a negative relationship with their building managers.
- Most satisfied when they were the sole tenant of a building and as a result had a positive relationship with their building managers.

Building management arrangements for single or multi-let buildings are distinctly different. However this indicates occupiers and building managers of multi-let buildings, should make a greater effort to engage with each other, to ensure a building is utilised to its optimum performance.

Occupiers who were satisfied with their building's performance were found to be more engaged with their building managers. This indicates that occupiers would benefit from having a more engaged relationship with property managers, ensuring occupiers are engaged with the performance of their buildings. It also supports the view that engaged property managers have a better understanding of occupier needs and are able to provide more satisfying working environments, particular in relation to performance measures.

For tips on how to work with your landlord or tenants see box D and E.

Future organisational changes

As more legislation comes on stream and organisations become increasingly accountable for the energy or carbon they consume, there will be a greater need for occupiers to understand the energy and carbon performance of their buildings. This will require greater collaboration between occupiers, building owners and facilities managers to meet each other's sustainability expectations.

This research has identified seven factors that organisations and building owners should focus on to ensure they are meeting the needs of future occupiers (table 2). Of these, 4 were deemed the most important future improvements: resource efficiency, better utilisation of technology, optimal utilisation of space and management practices.

Improvement	% of Total Responses	Informative recommendation quote
Resource efficiency	21	"paperless office".
Technology	18	"better utilisation of technology".
Space configuration	15	"Flexible space".
Management practice	15	"Better person management".
Engagement	13	"Genuine commitment from senior leaders to energy efficiency behaviours".
Indoor Environment	10	"More fresh air".
Work schedule	9	"Flexible working arrangements".

Table 2. Occupiers expectations and recommendations for change towards 2030

Future barriers to occupier sustainability

Occupiers believe that the most significant challenges to providing quality workplaces in the future will be the availability of affordable interventions (table 3). This suggests that many of today's solutions for occupier sustainability are priced too high or that organisations have limited budgets available to improve the sustainability of their workplaces.

Utilising workplaces in a flexible manner has been found to be a significant future challenge for occupiers. In the 1990s the recession brought on the need for shorter and more flexible leases[5]. However in today's economic climate, organisations are also faced with a growing ability to work outside of workplace environments due to increasing availability of mobile information technology.

The ability to deliver flexibility and create engagement was found to be a substantial challenge for providing a sustainable workplace in the future (table 3). This indicates that there is a need for organisations and building managers to adopt more engaging sustainability strategies that involve occupiers, building managers and owners to ensure energy and carbon targets are to be met.

Office at night by Chris Ballard. Source Flickr

Challenges	% of Total Responses	Informative Quote
Availability (Prices)	45	"Cost effectiveness of energy saving enabling solutions".
Flexibility	17	"Providing a workspace that fits the needs of an increasingly mobile workforce".
Engagement	16	"Changing people's expectations of what a workspace should provide…"
Management Practice	9	"Greenwash".
Incentives	9	"Balancing business productivity with sustainability".
Policy	5	"Pressure on time to meet all the ever changing environmental regulations".

Table 3. Challenges for providing a sustainable workplace towards 2030.

[5] Brenna O'Roarty, (2001),"Flexible space solutions: An opportunity for occupiers and investors", Journal of Corporate Real Estate, Vol. 3 Iss: 1 pp. 69 - 80

Case Study: Meeting current and future occupier expectations

Building name:	Premier House, 52 London Road, Twickenham, TW1 3RP	**Tenancy and sector:**	Multi-let office
Project type:	Low carbon building refurbishment and occupier engagement	**EPC before:**	E (111)
		EPC after:	B (45)
		Development Manager:	Stanhope plc, for the Low Carbon Workplace Fund
Size:	43,000 sq ft	**Contractor:**	Wates Construction
Age:	1970's concrete and brick office building	**Services Engineer:**	Flatt Consulting
		Architect:	Hawkins Brown

Premier House Low Carbon Workplace, Exterior.

Premier House before refurbishment.

Premier House on completion of CAT A works (active chilled beams).

Premier House, new reception.

The Story

A 1970's concrete and brick skinned office building, which had a poorly performing façade with single glazing and inefficient services. The Low-Carbon Workplace Fund recently acquired and undertook an extensive refurbishment to optimise the energy performance of the building through the introduction of low carbon technologies for internal climate control, including demand controlled plant, heat recovery equipment and free cooling systems.

Low Carbon Workplace applied a framework to deliver continual workplace carbon reductions to maximise the impact of the carbon reductions whilst working with stakeholders to sustain the change.
The outcome was:

- a highly energy efficient building when in use, delivered in a low carbon, sustainable way;
- improved office working environment that is open and bright for improved occupant satisfaction and productivity;
- external appearance that positively contributes to the wider urban environment; and
- increased use of sustainable transport for both staff and public, through facilities that encourage cycling, walking or running.

Occupier engagement

Low Carbon Workplace works with occupiers before, during and after they reside in the property to ensure the performance of the building is maintained as close as possible to its low carbon design intent. In addition to the installation of a comprehensive BMS, an integrated energy and occupancy monitoring system has been provided that allows occupants and building managers to manage the energy usage and emissions in occupation. Located less than 200m from Twickenham railway station, the property also has secure bike storage, and showers and lockers on each floor, to encourage the use of sustainable transport by office workers.

Premier House's high energy efficiency specification enables occupiers to apply for the Carbon Trust's Low Carbon Workplace Standard. The Standard is a workplace standard rather than a building type standard which engages occupiers in understanding how to optimise their building performance in line with its low carbon design and manage carbon emissions on a per person basis matching supply to demand.

Occupier engagement is delivered through three strategies:

1. Monitoring usage patterns enabled by sophisticated metering and control systems that allow occupiers to compare energy usage with occupancy levels on a near real-time basis.
2. Implementing an in-house carbon management system, supported by training on the building's control systems, regular performance reviews and ongoing advice on low energy occupation.
3. Embedding behaviour amongst occupants through a strong stakeholder engagement and communications programme to encourage organisation wide adoption of low carbon behaviour.

The 'techy' bit

The building underwent a 12 month refurbishment programme based on ongoing reductions in embodied and in-use carbon, to extend the life and quality of the building and create flexible accommodation for its occupiers.

The refurbishment was based on the following:

- replacement of windows;
- upgraded insulation;
- solar control glazing;
- installation of integrated occupancy energy monitoring;
- exposing the building's thermal mass;
- installation of an active chilled beam comfort cooling system (each beam has an individual control facility and is automatically adjusted through the BMS to control zonal temperature);
- energy efficient heating; and
- daylight and presence detection lighting systems.

As a result, Premier House's EPC rating improved from an E (111) to B (45) and is on track to achieve BREEAM 'Excellent'.

A Simplified Building Energy Model (SBEM) calculation was carried out for the base building, resulting in a predicted emissions level of 26kg CO2/m² (excluding tenant's installations) a significant improvement over the 'good practice' standard. Refurbished accommodation is expected to achieve in the region of a 50% reduction in carbon emissions when in use at high occupancy levels – and which should translate into significantly lower running costs for occupiers.

Case Study: Engaging your occupiers

Building name:	Hollywood House, Woking UK
Building type:	Commercial office
Project type:	Refurbishment
Size:	5,317 m² five storey building
Age:	Built in the 1980s
Tenancy:	Multi-let Office
EPC before:	G
EPC after:	C

Hollywood House,exterior. Hollywood house, interiors and showers for cyclists.

The Story

Hollywood House received a sustainability refurbishment due to partnership between the building owners Prupim and the main occupiers, which improved the EPC standard of the building from a G to a C. The key ingredients for this cooperative project were due to the following:

- current occupiers lease coming to an end and the current building no longer meeting their organizational sustainability standard;
- occupier satisfaction with the current building location and main physical attributes;
- emerging legislation which may prohibit the lease of buildings with a F or G rated EPC.

Cooperation between the owners and occupiers led to a higher sustainability specification than would have been possible, ensuring that the occupiers significantly reduced their energy, water and carbon use and that 1,574m² of the building was pre-let on a ten-year lease.

Technologies were deployed throughout the building to improve the building's energy and water consumption, and combined with occupier information systems to enable continued engagement for occupier behaviour change. New technologies and the overall refurbishment has resulted in improving the building EPC rating from a G to a C, which significantly improved the buildings service charge, carbon emissions and overall sustainability.

Breaking the Landlord Tennant Barrier

To maintain the sustainability of the occupiers Prupim incorporated a green lease clause and Memorandum of Understanding (MoU), both developed from the publicly available Better Buildings Partnership Green Lease Toolkit template (box D). Implementation of the MoU has led to the development of an Environmental Management Plan that sets out building performance targets for both the landlord and tenants.

In addition a Green Building Management Group was established to provide a platform for all occupiers, building managers and owners to work together to understand the building's performance and drive environmental improvements.

The refurbishment has resulted in the building achieving a BREEAM 'Very Good' standard and the tenants succeeding in receiving a LEED Commercial Interiors assessment for their leased area, which resulted in a 'Platinum' rating, the first in the UK, outside of London.

The 'techy' bit

- Natural night time cooling and timer controls to desks' electricity supplies;
- High energy efficient lighting, with occupancy and daylight sensing and local control;
- Smart metering for each floor and the main plant;
- Showers fitted for runners and cyclists with flow restrictors;
- 24 cycle storage spaces;
- Rainwater harvesting with 10,000 litre capacity;
- Electrical car charging points;
- Solar heating for hot water to the washrooms;
- Solar photovoltaics, which will produce a minimum of 11,630 kWh of electricity per year, with the potential to save 6.606 kg of CO_2 a year;
- Connection to Woking Council's District Heating and private wire system.

This project forms part of Prupim's organisation wide environmental management strategy and their on-going customer relationship programme.

4. Conclusions and recommendations

This research:

- evaluated what the occupiers of the UK office market thought about the sustainability of their workplaces;
- identified their expectations for sustainable workplaces in the future; and
- highlighted the potential implications for commercial building owners and managers.

We have found that improving the sustainability of commercial buildings is becoming increasingly important for building occupiers due to increasing resource costs, social demand and regulation.

Building occupiers were found to be very interested in their workplace sustainability and are certain that building sustainability will rise in importance, due to increasing energy prices, emerging regulation and organisational demand. However, occupiers believe that organisations, building owners and building managers could all play a more active role in engaging with one another to improve building energy efficiency.

Effectively improving a building sustainability requires engagement across most sectors within an organisation and collaboration with multiple stakeholders for each building. We have identified practical implications from this research project and made recommendations for occupiers, building owners and related stakeholders to deliver more sustainable buildings.

Collaborating and transparency:

Despite staff or board members being viewed as the key drivers of workplace sustainability to date, the research indicated that in the future this is expected to change. Instead shareholders, trustees and customers will be instrumental in driving initiatives.

Recommendation:

Building occupiers, owners and managers should pay increasing attention to sharing building reporting and performance information with each other, as the demand for data transparency and occupier engagement is likely to increase.

Engaging with an occupier is a great opportunity to further a building's performance. A recent LessEn roundtable debated the best solutions for how landlords and tenants to engage has highlighted 10 key learning principles on how landlords and tenants (box E).

Box E: Working with your landlord or tenant

10 key learning principles from the Landlord Tenant Relationship LessEn Roundtable

1. Goal setting and partnership working based on transparent data sets is extremely important.
2. "The key is to create a great workplace first and then make it energy efficient."
3. "Changing equipment within a commercial building is easy, but it is far more important and difficult to change the attitudes of occupiers and landlords."
4. Effective engagement between building occupiers, landlords and facilities managers is the key challenge which needs to be overcome in pursuance of the goal of carbon emission reduction.
5. Companies are increasingly aware that they must place importance on carbon reduction if they are to effectively engage with generation 'Y' and 'I'.
6. Increasing the accountability of suppliers makes the goal of carbon emission reduction more achievable.
7. It is important that landlords and tenants agree that reducing carbon emissions is a shared problem, as well as agreeing to share the benefits.
8. "Understanding what your tenant does for a living will make a huge difference in terms of promoting energy efficiency."
9. Brand image to consumers and employees is more important to occupiers than energy efficiency and associated costs.
10. Location is still the primary factor considered by both landlords and tenants.

A tool for measuring occupier satisfaction and asset quality

EPCs were also found to be a holistic indicator for occupier satisfaction. Occupiers of A, B, C and D rated buildings were found to be increasingly satisfied with their building sustainability performance compared to occupiers of E, F and G rated buildings. Occupiers with higher EPCs were also found to be more satisfied with their overall building facility, which could indicate that property owners and managers who succeed in addressing energy performance are also adept at providing building facilities with greater occupier value and building quality.

Recommendation:

Organisations and building owners could utilise EPCs as an educational tool for engaging occupiers in workplace sustainability. More in-depth building assessment and engagement tools exist and EPCs provide a good starting point for developing a better understanding and value for building sustainability.

Occupier satisfaction and rental value

Value in terms of rent was found to be an imperfect measure of occupier satisfaction as there was no association for any attribute other than workplace aesthetics and location. This suggests that there is no 'green premium' for UK commercial buildings in relation to rent. It therefore raises the question if 'value' should only be measured on the basis of rental premiums?

Occupiers who were more engaged with their building owners or facility management were also more satisfied. This could indicate that buildings with a high EPC that have engaged occupiers, could more likely be long-term tenants and therefore be of more value to building owners and investors.

Prepare for the future

This research has also highlighted that occupiers are aware of the increasing risks of emerging legislation and rising resource costs. The full impact on occupiers and building owners is still not fully understood, but both should be preparing for the following:

1. 2013 (April or October) (draft legislation) large organisations will need to report their organisational Greenhouse Gas emissions (*see References and further reading*).
2. 2016 (April) building owners will not be able to refuse reasonable requests from their occupiers to improve their energy performance of their property (UK Energy Act 2011).
3. 2018 (April) it will be unlawful to rent out a premises which has less than an "E" EPC rating (UK Energy Act 2011).

This report is therefore a timely reminder that emerging legislation will have an impact on commercial buildings. Building owners, building management and occupying organisations should take into consideration the above changes and prepare to be more transparent and collaborate on improving the occupier sustainability.

Further research questions

Our research provides an overview of how the UK commercial real estate sector is meeting the needs of current and future environmental requirements. Further research questions that arise from this research include:

- ? Is occupier satisfaction similarly correlated to EPCs across all European countries?
- ? Do occupiers think differently when they come towards the end of their tenancy and do they approach their landlords for improving their buildings to negotiate a new lease?
- ? Which commercial organisations are the most sustainable occupiers and what mechanisms do they utilise to deliver a successful sustainable approach?
- ? What occupier engagement mechanisms deliver the most effective improvements in building sustainability?
- ? Are increasing levels of technology and data providing a solution for engaging occupiers and driving building efficiency?
- ? How can building owners and occupiers maximise the positives of an EPC?
- ? What mechanisms have occupiers successfully utilised to influence the awareness of price takers (shareholders and customers) of their organisations environmental value?

5. References and further reading

The UK Government Department for Environment Food and Rural Affairs (Defra) is current consulting on guidelines to help businesses that want to demonstrate their corporate sustainability credentials to do it in a clear and concise way. Yet to be published: Reporting Sustainability Guidance:
Department for Environment, Food and Rural Affairs
http://www.defra.gov.uk/news/2012/07/25/reporting-sustainability-guidance/

How can common barriers to energy efficiency be overcome? Research into the future of energy efficiency by Energy Efficiency in the Built Environment, Cambridge University
http://www.less-en.org/?page=blog&article=176

Supply Demand and the Value of Green Buildings, RICS March 2012
http://www.rics.org/site/download_feed.aspx?fileID=11662&fileExtension=PDF

IPCC, 2007: Summary for Policymakers. In: Climate Change 2007: Mitigation. *Contribution of Working Group III to the Fourth Assessment, Report of the Intergovernmental Panel on Climate Change* [B. Metz, O.R. Davidson, P.R. Bosch, R. Dave, L.A. Meyer (eds)], Cambridge
University Press, Cambridge, United Kingdom and New York, NY, USA.
http://www.ipcc.ch/pdf/assessment-report/ar4/wg3/ar4-wg3-spm.pdf

Energy Performance Certificates for non-dwellings, Department for Communities and Local Government, 2008
http://less-en.org/?page=EPCs#

Better Buildings Partnership have developed a series of easy to use toolkits, such as the Green Lease Toolkit:
http://www.betterbuildingspartnership.co.uk/working-groups/green-leases/green-lease-toolkit/

Academic Research

Parkinson A.T., De Jong R., Cooke A.J., Guthrie P.M., *Energy Performance Certificates as a Signal of Workplace Quality.* Energy (Under Review).

Appendix

Supporting information of the research methodology and findings

Table 4. Value of Green Workplace survey: Environmental items of the workplace satisfaction.

Item (Workplace Attribute)
Energy performance, as defined by label or certificate
Property environmental performance, as defined by label or certificate (eg BREEAM, LEED)
Operational environmental impact
Running costs (including rent, service charge, and energy costs)
Configuration (including space requirements and adaptability)
Indoor environment (including comfort, acoustics, air & lighting quality and control)
Aesthetic appearance (including cultural significance)
Occupant understanding of how the building operates
Property managers understand workplace sustainability needs
Functionality (including level of distraction, privacy, storage space, security and IT provision)
Location (including proximity to public transport, accessibility, retail, other businesses, and outdoor space)

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Aidan Parkinson

Aidan Parkinson is studying for a PhD at the Cambridge Universities' Centre for Sustainable Development. His research seeks to develop and demonstrate a positivist approach to investment decisions relating energy management of UK offices taking into consideration uncertain climate and national energy infrastructure towards 2050.

Aidan has been awarded an EPSRC Industrial CASE studentship. Within this arrangement, Aidan actively disseminates his research findings to his industrial partner Grosvenor Group, a privately owned international property firm. Also during his studentship, Aidan has been Treasurer of Cambridge Universities' GreenBRIDGE student society, coordinated community workshops on energy efficiency for Cooke Associates, collaborated with LessEn on market research, and was a key contributor to the Energy Efficiency in the Built Environment (EEBE) research programme.

Before joining the Centre for Sustainable Development, Aidan completed a Masters in Environmental Design and Engineering at UCL, and a Bachelors of Engineering in Architectural Engineering at Heriot-Watt University.

Aidan had previous work experience at Hoare Lea and Atkins as a building services engineer, predominantly developing the design of mechanical HVAC plant on a variety of new build and retrofit projects.

ULI Europe

Robert de Jong

Robert is a Project Manager for the Urban Land Institute Europe sustainability initiatives and is lead manager of the LessEn initiative, a project aimed at encouraging better energy efficiency and retrofitting in commercial buildings. He works with ULI's leading networks, initiative partners and LessEn community to enable individuals and organisations to achieve substantial energy reductions. Further projects he has led include a Belgravia regeneration project for Eccleston Place; UK schools energy league table; building energy case studies; world's first global energy map and leading building energy forums across Europe.

Prior to his role with LessEn and ULI, Robert worked on a low carbon project for a London Borough, supporting the implementation of community and business energy efficiency initiatives. Robert has also spent over 8 years within the sustainability field in Australia advising businesses and community groups in developing sustainability strategies.

Robert holds a degree in Environmental Management and Sustainability

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