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A Tale of Two Buildings

*Are EPCs a true indicator
of energy efficiency?*



Working to make buildings better

The objective of this report is to demonstrate how Energy Performance Certificates (EPCs) alone are not sufficient in delivering the Government's targets to 'de-carbonise' the UK's built environment. EPCs focus on 'design intent' or theoretical energy efficiency. In this report we emphasise the importance of measuring and achieving reductions in actual energy consumption in buildings. In doing so, we present the case for the introduction of mandatory Display Energy Certificates (DECs) for commercial property. We also explore the actual energy reductions that have been achieved across the combined portfolio of the Better Buildings Partnership (BBP) members' managed London properties.

In particular, we look at:

- A comparison of two EPC-rated buildings to see how they actually perform and, by looking at the bigger picture, find that these two examples are not unique
- How successfully the industry is tackling the issue of reducing actual energy consumption
- What to do next – recommendations and guidance for owners and occupiers

For the last four years, Jones Lang LaSalle has been working with the BBP to measure the actual energy performance of its members' managed properties in London – over 200 buildings – making this one of the largest voluntary disclosures of energy performance data for any city in the world.



Question:

Which is more energy efficient?



ROPEMAKER PLACE
LONDON EC2Y 9LY

*Two offices
Two different EPC ratings*



Energy Performance Certificate

Rating:



46



Energy Performance Certificate

Rating:



109



10 EXCHANGE SQUARE
LONDON EC2A 2BR

The Answer is surprising...

One would expect that Ropemaker Place would be the more efficient. However, the reality is that 10 Exchange Square is actually 66% more efficient (in terms of actual energy consumption). As surprising as this is, this scenario is far from unique, with similar findings being found in a number of buildings across London.

This highlights the shortcomings of relying on EPCs alone, showing that actual energy performance, as opposed to theoretical, should be the real focus for commercial property owners and occupiers – an area that is currently neglected by Government policy. After all, it is only reductions in operational energy use that will enable us to meet CO₂ emissions reduction targets at asset, portfolio and national levels.

Energy Performance Asset Rating



Energy Performance Certificates (EPCs) are a mandatory requirement for the sale and letting of commercial buildings, and are designed to inform interested parties of the building's energy performance. However, EPC ratings only assess theoretical performance or design intent and do not measure actual energy consumption.

What should be stressed in regards to energy consumption in a building is the integral part played by the occupier. Occupiers' energy demands can vary significantly, depending on the energy loadings of fitted-out space, the intensity of energy use and an occupier's operating hours – all factors that affect the energy consumption in a building. Yet EPCs do not take these complexities or variations of use into account.

EPCs don't tell the whole story

Therefore, in the absence of mandatory Display Energy Certificates (DECs) - which are based on actual (metered) energy consumption – how can the commercial property sector fully understand the environmental impact of its buildings, and effectively communicate actual energy performance to the market place?

Jones Lang LaSalle and the BBP have been working closely over the years, firstly to understand the true environmental impacts of buildings – by under taking primary research of monitoring and benchmarking the BBP members' buildings¹, and secondly to define the most appropriate way to communicate actual energy performance to the market – by supporting the industry's call for the introduction of mandatory DECs for commercial property.

EPCs do have their place. They can undoubtedly help to set goals for improved design and refurbishment of buildings, and similarly, for investment in improvement measures, some of which can lead to a more energy efficient building. However, our analysis of the actual energy use of more than 200 properties shows that there is little or no correlation between EPC ratings and actual energy performance.

Across more than 2 million square metres of floor-space assessed, in the period 2011/2012, the average energy consumption of a building is found to be remarkably similar whether the building has an EPC rating of 'C', 'D' or 'E' (see Figure 1).

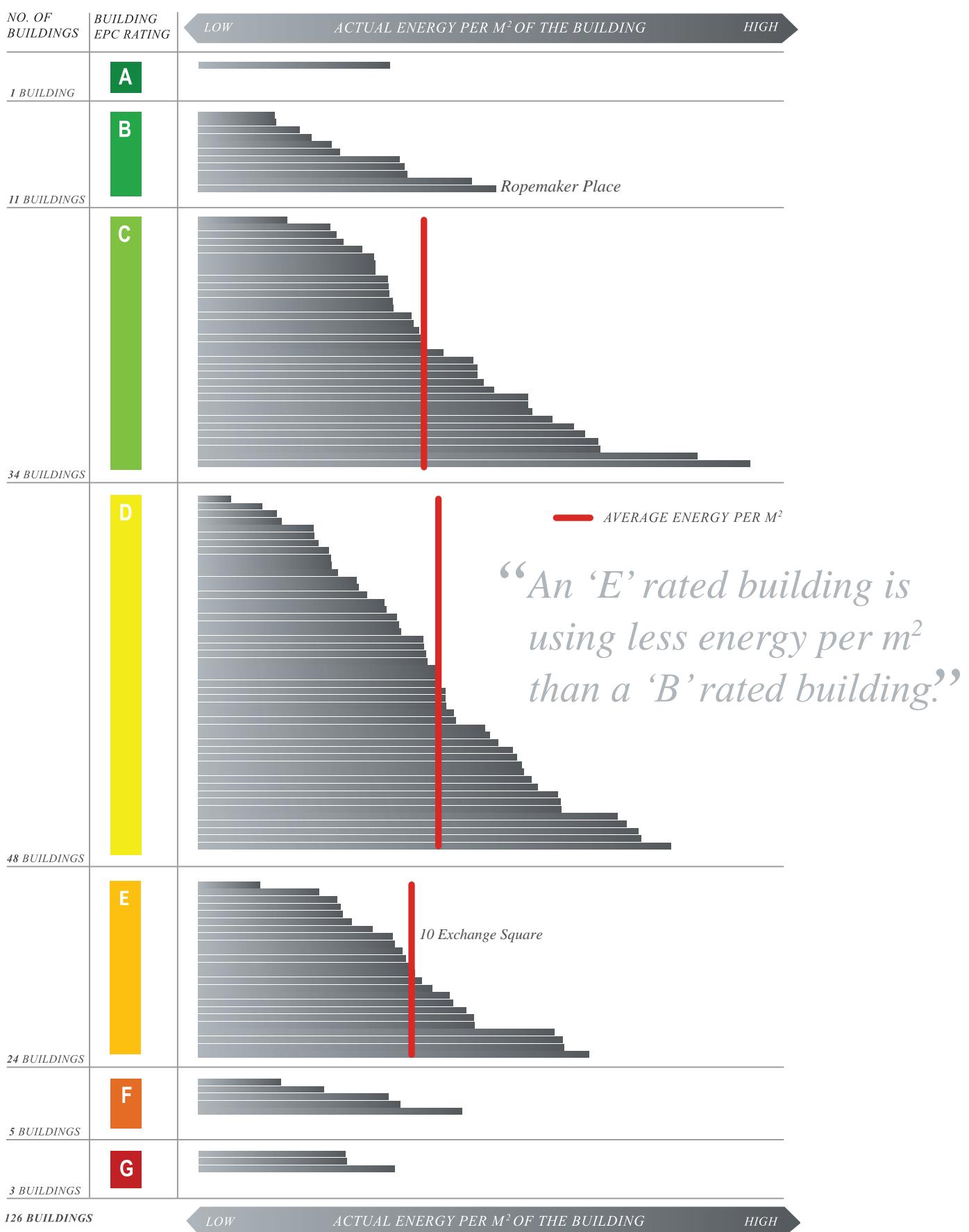
Our research also shows that there is a wide spread of energy intensity within each EPC rating band (A to G) – and that the single most intense building is actually C-rated. This reinforces the conclusion that there are many factors that influence actual energy performance beyond simply 'design intent'.

The Government is in the process of considering further legislation aimed at reducing CO₂ emissions from the commercial property sector, and its current proposal is to introduce minimum performance standards based on EPC ratings. The legislation, planned to be introduced in April 2018, is intended to go as far as deeming any building that does not meet the standard as 'unlettable'. At present, the suggestion is that this minimum standard would be an E rating.

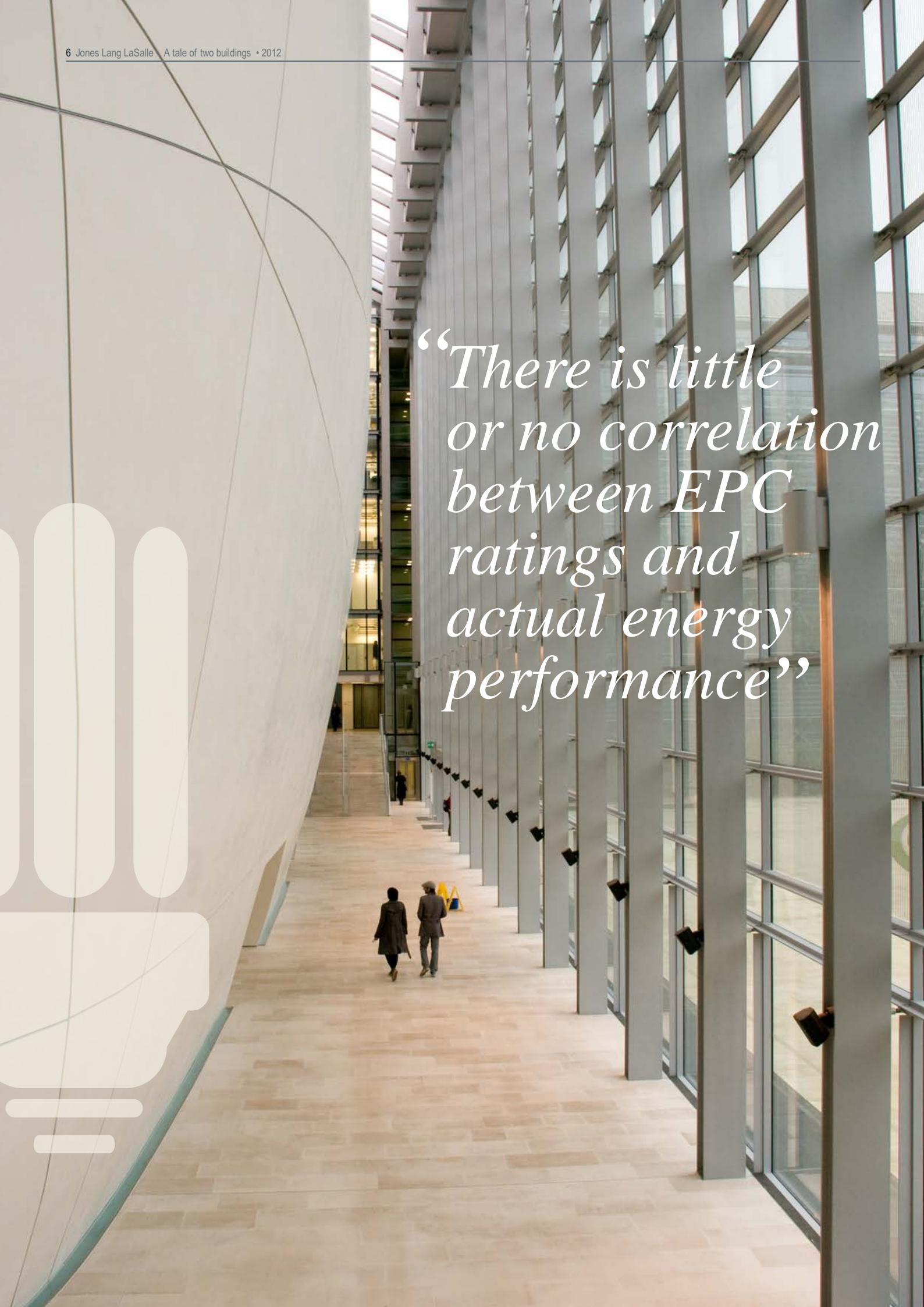
In light of our research, it must therefore be questioned how effective these minimum standards will be in reducing actual energy consumption and associated CO₂ emissions for the UK.

¹BBP Members' managed properties in London, representing more than 200 buildings.

Figure 1 – Actual energy use of more than 100 BBP member offices grouped by their EPC rating



“There is little or no correlation between EPC ratings and actual energy performance”



Focusing on actual energy use delivers real savings

In view of the proven inability of EPCs to demonstrate actual energy performance, the BBP, supported by Jones Lang LaSalle, has been measuring and benchmarking its members' portfolios for the past four years. Here we examine how members have performed in terms of reducing CO₂ emissions

8%

*Reduction in
energy use
over two
years*

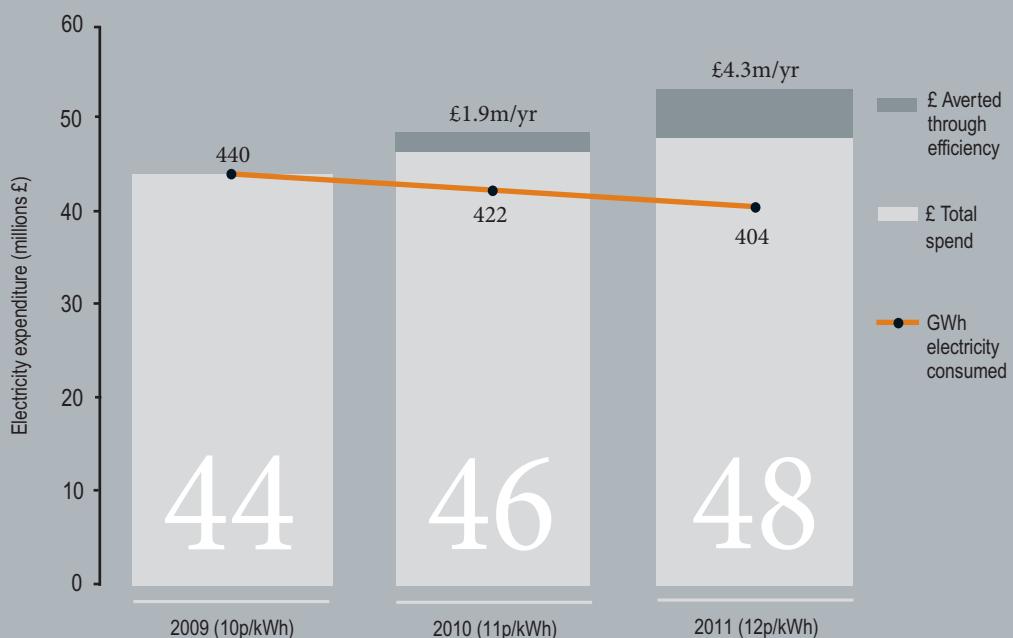
Headline findings

In 2012 Jones Lang LaSalle analysed energy performance for the BBP. It covered:

- 225 properties in London
- 14 of the largest commercial property owners in the UK
- 2 million square metres of floor-space
- A carbon footprint equivalent to 350,000 tonnes CO₂
- The findings showed like-for-like² CO₂ emissions reductions of 5% between 2010/11 and 2011/12 - a reduction of 15,000 tonnes
- The average energy intensity for whole building non-air conditioned office is 88kg CO₂ / m² / year and air conditioned is 162kg CO₂ / m² / year

On a like-for-like basis, the BBP's members have achieved an 8% reduction in CO₂ emissions in the two years since 2009/2010. This is significant progress in environmental terms, however these improvements in building energy efficiency also demonstrate compelling financial benefits, with a reduced spend on energy bills³ totalling over £4 million (see Figure 2). Not only does this help property owners to mitigate the risk of future energy price rises, but it also lessens their exposure to potential CRC⁴ costs, as well as offering their occupiers a more efficient building to occupy.

Figure 2 – Like-for-like spend and savings on electricity bills for BBP Members' portfolio



²The same 160 properties in each year.

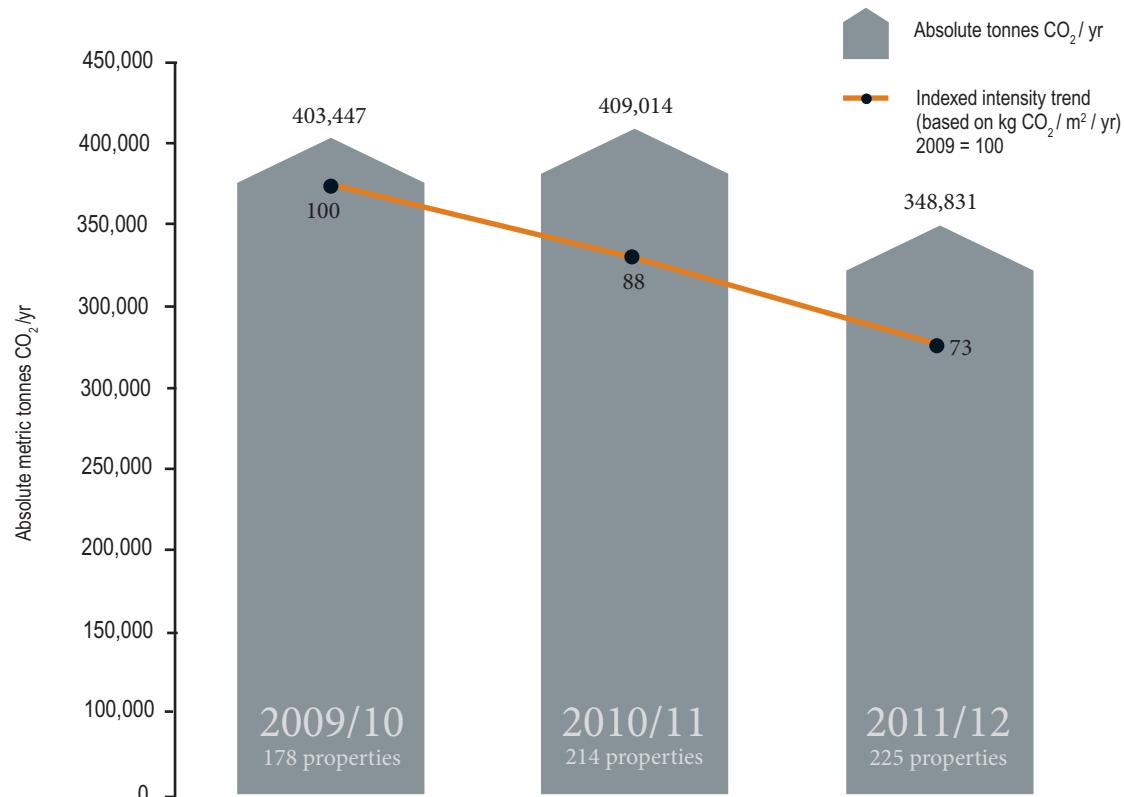
³Savings in electricity spend are based on actual kWh reductions but assume a typical unit cost of 12 pence per kWh.

⁴CRC Energy Efficiency Scheme.

Our analysis also shows that on an absolute basis, total CO₂ emissions have understandably fluctuated over time due to churn in the group portfolio (see Figure 3). However, when we normalise the data by floor area⁵, the portfolio has achieved continual reductions in energy intensity of 27% over the last two years, partly achieved

through efficiency improvement measures, both low and no cost, and through higher levels of capital expenditure. Case studies showing how selected BBP members have contributed to such reductions can be found later in this report.

Figure 3 – Absolute CO₂ emissions from BBP Members' portfolio 2009/2010 to 2011/2012



£4 million saved in energy bills

With such notable financial savings achieved through energy reductions, the issue of split incentives is a hot topic for the industry. Who benefits from a more efficient building: the occupier or the owner? In simple terms – both. By designing and maintaining an efficient building, the owner is able to offer a more attractive space to prospective

occupiers, who in turn benefit from reduced energy costs. It is crucial that the industry understands and embraces this 'mutual benefit' approach; it is the security of the lease that will enable the owner to justify the capital expenditure needed to improve the performance of the building.

⁵ By measuring energy consumption (kWh) per m²

Collaboration is key

*Working together will be the most powerful
'enabler' of better building performance*

With buildings contributing over 40% of UK CO₂ emissions, and the commercial sector making up a third to half of that⁶, it is clear that our sector will continue to be a focus for Government as it seeks to meet the rapidly approaching CO₂ emissions target deadlines. But who is actually responsible for generating the emissions within a building?

No two buildings are the same, but in a survey conducted by the BBP, the occupier can be responsible for as much as 80-90% of an office portfolio's energy consumption⁷. This concludes one thing – collaboration between owners and occupiers is vital in achieving CO₂ emissions reductions in the built environment.

This report highlights the successes by some owners in making improvements in their buildings, and quite often these improvements will have benefited the occupier, either directly or indirectly. However there are still sizeable barriers to enable continued and greater improvements in the efficiency of our building stock. For owners it is often difficult to justify financial investment in low carbon technologies or highly efficient kit, when the returns from any savings will generally benefit the occupier. For occupiers on the other hand, it can be hard to rationalise any capital expenditure in a building they lease, when the potential value uplift accrues to the owner.

⁶http://www.les-ler.org/documents/11_booklet_final.pdf

⁷[http://www.betterbuildingspartnership.co.uk/download/bbp-position-paper---voluntary-decs-and-ler-\(final\).pdf](http://www.betterbuildingspartnership.co.uk/download/bbp-position-paper---voluntary-decs-and-ler-(final).pdf)

It is therefore vital that owners and occupiers collaborate to share good practice and agree common solutions.



The BBP has been working hard to encourage collaboration between the two parties, publishing useful guides and toolkits, and sharing the successes of its members. Some of the key instruments of successful collaboration are identified here.

- **Leveraging the role of the Managing Agent:**

Managing Agents have a key role to play. They are the conduit linking owners and occupiers and are ideally placed to appreciate and promote the environmental aspirations of both parties and to facilitate cooperation.

- **Better metering and monitoring:** benefits are available to both owners and occupiers by installing better energy metering systems. Itemising energy use of services/areas within buildings through separate metering helps each party to understand the impact of their own respective use.

- **Frameworks and guidance for owner/occupier collaboration:** creating frameworks for open two-way dialogue between owners and occupiers – either through informal arrangements or formal agreements (green clauses in leases) – allows mutually-beneficial efficiencies to be driven through close working relationships.

- **Green Building Management Groups:** the owner (or representative managing agent) has the opportunity to bring all parties involved together. A proven means of facilitating this is for owners to set-up and run Green Building Management Groups.

- **Financial models:** it is often difficult to justify financial investments to improve building performance that accrue benefits to both owners and occupiers. However, this can be overcome by agreeing financing arrangements between both parties. For example, using exceptional expenditure / project works through the service charge or a sinking fund if the lease allows.

Several BBP members have had great success by working more closely with their occupiers. Here are a few notable case studies.

Case Study: 10 Exchange Square - British Land

At 10 Exchange Square, British Land brought together all parties involved in the building to work on sustainability initiatives. Over a period of two years, this collaborative approach has saved 1,530 tonnes of CO₂, and £235,000 on occupiers' energy and water bills.

[>Download Case Study](#)

Case Study: Prospect House – Hermes Real Estate

At Prospect House, Hermes Real Estate worked with the occupier, NBC Universal, and the Managing Agent, Jones Lang LaSalle, to implement sustainable technologies and management strategies, as part of its Responsible Property Management programme. In its first year, this achieved a 15% reduction in annual CO₂ emissions.

[>Download Case Study](#)

Case Study: 40 Grosvenor Place - Grosvenor

Since installing an extensive automatic meter reading (AMR) system at 40 Grosvenor Place in 2006, Grosvenor has saved occupiers £676,600 on energy bills and has cut CO₂ emissions by 17,650 tonnes.

[>Download Case Study](#)

Case Study: Hollywood House - PRUPIM

At Hollywood House in Woking, PRUPIM worked in partnership with Skanska as both occupier and contractor to deliver a sustainable refurbishment. On the two floors occupied by Skanska, this is reducing energy use by 56% and significantly improving water efficiency, saving £28,000 each year, as well as cutting CO₂ emissions by 113 tonnes.

[>Download Case Study](#)

Case Study: 50 Pall Mall – Legal & General Property

Legal & General Property has cut gas consumption at 50 Pall Mall by more than half in just one year, through proactive management, engagement with occupiers and refurbishment works. This has contributed to annual energy cost savings of over £40,000.

[>Download Case Study](#)

For detailed guidance on how to improve the energy performance of buildings and portfolios, there are a number of easily-accessible toolkits available to owners and occupiers:

Toolkits and Guidance:

Better Metering Toolkit

A guide to improved energy management through better energy metering.

[>Download Toolkit](#)

Green Lease Toolkit

A comprehensive toolkit covering green leases and Memorandums of Understanding to enable owners and occupiers to work together to reduce the environmental impact of their commercial properties.

[>Download Toolkit](#)

Green Building Management Toolkit

A practical toolkit providing guidance and tools to support commercial property owners in setting-up and running Green Building Management Groups.

[>Download Toolkit](#)

Low Carbon Retrofit Toolkit

A summary of the challenges facing owners and occupiers in implementing low carbon retrofit technologies within commercially rented buildings and a solutions-based roadmap to help overcome these barriers.

[>Download Toolkit](#)

Managing Agents Sustainability Toolkit

A practical guide for Managing Agents acting as the conduit between owners and occupiers.

[>Download Toolkit](#)

Sustainability Benchmarking Toolkit

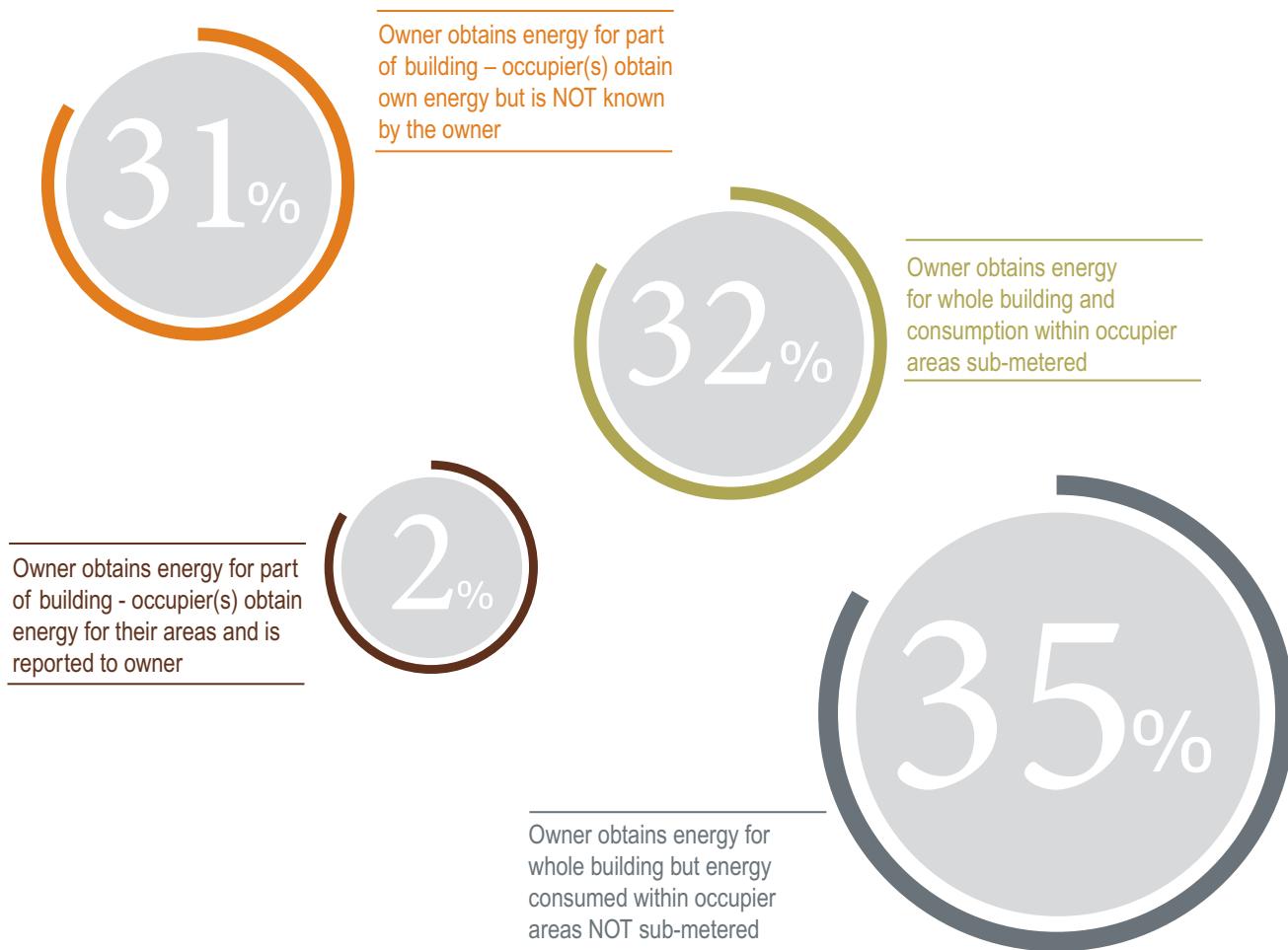
A comprehensive toolkit which details the issues and challenges businesses face when benchmarking the sustainability performance of their buildings.

[>Download Toolkit](#)

Hurdles to measuring performance

In striving to measure, benchmark and analyse actual energy performance more accurately and consistently – thus enabling universal design, operational and behavioural changes to buildings – the industry faces a number of challenges, that have implications for owners and occupiers alike, in understanding and reporting energy use. Figure 4 highlights the issue of data availability in the BBP members' office buildings.

Figure 4 – Who procures energy in offices and how it is sub-metered?



This demonstrates that, while in most offices the owner obtains energy for the whole building, for those where occupiers obtain their own energy, such consumption data is rarely known by the owner. If occupier consumption data is not reported it makes it very difficult to understand how efficiently these buildings are operating, as they cannot have their energy intensity measured accurately.

If this data is representative of the wider property industry, it indicates a challenge for many owners and occupiers in terms of not only interpreting the data for the purposes of understanding and communicating whole building performance, but also monitoring the impact of specific initiatives or actions. For example, if energy consumption in occupied areas cannot be itemised through sub-metering, it makes it difficult to distinguish

between the effects of occupiers' own energy conservation efforts and those resulting from owners' improvements.

The BBP and Jones Lang LaSalle strongly recommend the use of advanced metering systems to accurately measure, report and understand how a building is performing. An encouraging trend (within the BBP members' portfolios) is that of the properties where the owner obtains energy for the whole building – there has been an increase in the percentage of energy consumed within occupier(s) areas that can be itemised through sub-metering.

Concluding remarks

If the commercial property industry is to succeed in achieving the Government's ambition of cutting the associated CO₂ emissions of the built environment, it is imperative for the industry, backed by Government direction, to focus on actual energy performance rather than just 'design intent'. We have shown that there is little or no correlation between a building's design (as measured by its Energy Performance Certificate) and its actual consumption.

We have also highlighted that many property owners and occupiers do not have the necessary information to accurately monitor the performance of whole buildings, and robustly recommend that better metering is vital to improve the accuracy of energy monitoring. It is also evident that a more efficient building – and sharing of mutual benefits – can only be achieved through a close working relationship between the owner and occupier.

The BBP members' portfolios achieved a reduction in the associated CO₂ emissions of 8% and made a saving of more than £4 million in energy bills, between 2009/2010 and 2011/2012. This success, built on a range of case studies of innovation and collaboration, highlights the possibilities that are available to, and within the reach of, all property owners and occupiers. If the level of success achieved by BBP members were applied to the total existing office stock of Greater London, savings could be in the order of £70 million.

The BBP and its members are committed to sharing best practice with the wider industry to drive efficiencies across the built environment.



About The Better Buildings Partnership

The Better Buildings Partnership (BBP) is a collaboration of London's leading commercial property owners and allied organisations, supported by the Mayor of London and the Greater London Authority. The BBP's objective is to overcome the barriers to more sustainable practices in existing commercial building stock not just in London but throughout the UK. It is through its measurement and benchmarking work, as well as other work streams of the BBP, that solutions are emerging.



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About Jones Lang LaSalle

Jones Lang LaSalle (NYSE: JLL) is a financial and professional services firm specialising in real estate offering integrated services worldwide to clients owning, occupying or investing in real estate. Jones Lang LaSalle serves clients in 70 countries from more than 1,000 locations worldwide, including 200 corporate offices. The firm is an industry leader in property and corporate facility management services, with a portfolio of approximately 2.1 billion square feet worldwide.

A key element of Jones Lang LaSalle's business strategy focuses on the development and implementation of energy and climate strategies on behalf of building owners and occupiers. Such work is underpinned by the measurement, management and disclosure of sustainability performance. Jones Lang LaSalle has measured, benchmarked, and reported on the sustainability performance of over 3,000 commercial properties for many companies across the globe.



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