



REAL ESTATE ENVIRONMENTAL BENCHMARK

A 5 year journey

Executive summary

HIGHLIGHTS FROM THE PAST 5 YEARS



+74%

INCREASE IN FLOOR AREA



58,000

TONNES OF CO₂ EMISSIONS SAVED



22%

IMPROVEMENT IN ENERGY EFFICIENCY



20%

REDUCTION IN LIKE-FOR-LIKE ENERGY CONSUMPTION



£15.4M

IN ENERGY SAVINGS

The Better Buildings Partnership (BBP) is a collaboration of 27 of the UK's leading commercial property owners, representing over £180bn worth of assets under management and over 42 million m² of space, who are working together to improve the sustainability performance of existing buildings.

The Real Estate Environmental Benchmark (REEB) is an initiative run by the BBP to assess the operational performance of our members' UK commercial property portfolios and produce operational energy benchmarks for the wider industry. It is the largest voluntary initiative of its kind in the UK whereby, on an annual basis, our members have submitted data on over 1,000 properties. REEB provides a valuable insight into the energy performance of commercial property in the UK and the improvements that can be achieved on actively managed real estate portfolios. The resulting benchmarks also provide robust, market based KPIs for two of the most important real estate asset classes (office and retail) from both an investment and environmental point of view to which others within the industry can compare and target performance against.

With the initiative now in its sixth year, this report provides a summary of the 2015 results and a retrospective assessment of how BBP members' portfolios have performed over the past 5 years. It demonstrates that, collectively, BBP members have made substantial reductions in the energy and carbon intensity of their property portfolios. As industry leaders, BBP members are not only playing their part in meeting UK Government carbon reduction targets and supporting energy security, but also see this as a critical element of their strategies to protect and enhance the value of their property portfolios.

Introduction

Measurement and reporting is one of the BBP's most important areas of work. We believe that assessing the operational performance of commercial properties is fundamental to understanding investment risks and opportunities.

The BBP's Real Estate Environmental Benchmark or REEB has been developed over the past 5 years in response to the need for common indicators of performance in use, and industry benchmarks to enable comparison across peers. The benchmarking criteria and methodology has been developed by the industry, for the industry and therefore reflects the parameters that are commonly used, understood and over which property owners have control.

Based on the annual consumption data of over 1,000 of our members' managed properties, REEB provides energy, water and waste performance benchmarks for offices, shopping centres and retail / leisure parks which others can use to compare the operational performance of their properties.

Why is performance in use important?

There are a plethora of different sustainability standards and benchmarks in the property industry, but there are very few that assess how individual properties **actually perform in use** and none that have the coverage and industry support of REEB. The 'performance gap' is a well documented problem; buildings rarely perform in line with their predicted energy consumption patterns. Indeed, there is a significant gap with in use energy consumption significantly exceeding predicted levels. This means that the standards and benchmarks that property investors, owners and managers are using to understand the environmental performance of their properties do not accurately represent how they perform in operation. REEB provides a solution to this, enabling these stakeholders to understand how buildings actually perform relative to their peers.

How do I know the data is accurate?

The quality of data is critical to the integrity of the benchmarking process. Many BBP members have their own internal processes for verifying their data before submitting it to the REEB benchmarking process. In addition, BBP runs its own data checking process using a combination of statistical analysis and one-to-one engagement with members. REEB helps to identify where data quality can be improved and establish common metrics to enable more consistent reporting across different members and property types.

Can anyone use the benchmarks?

The REEB benchmarks are publicly available for anyone to use and are becoming established as THE industry benchmarks for performance in use. They are already being used by investors to set performance targets for their real estate investments and the data is made available to other organisations who share the BBP's objectives. The latest benchmarks are available via the [BBP website](#)¹.

What is the future strategy for REEB?

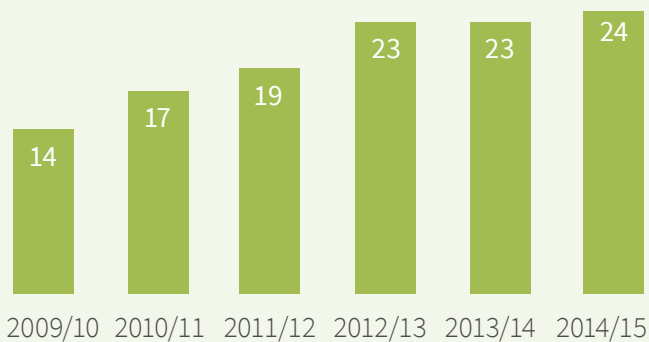
Increasing the REEB dataset and use of the benchmarks is critical and will enable the benchmarks to become more representative and sophisticated. Over the coming years, we will be working hard to increase access to and participation in REEB, enabling those outside of the BBP to participate. This is reflected in our recent partnership with EnergyDeck to utilise their online platform to house the REEB dataset.

A natural area of expansion is also our Managing Agents Partnership with 10 of the UK's leading agents, managing over 90 million square metres of space across +26,000 properties. Some of these properties will be incorporated in 2016 as a pilot, providing the potential to significantly increase the dataset.

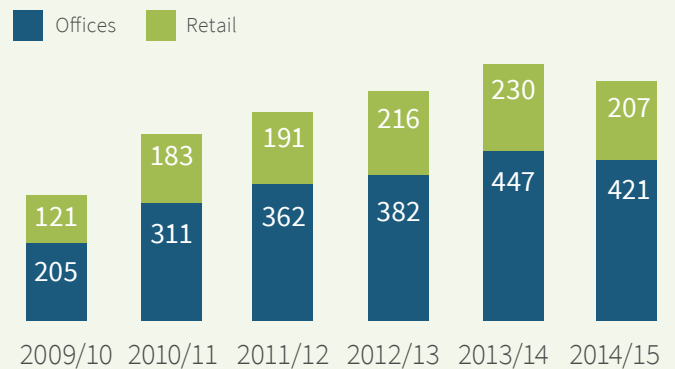
A snapshot

IN 2015 THE BBP MEMBERS SUBMITTED DATA ON OVER 600 ASSETS COVERING OVER SIX MILLION SQUARE METRES OF UK COMMERCIAL PROPERTY

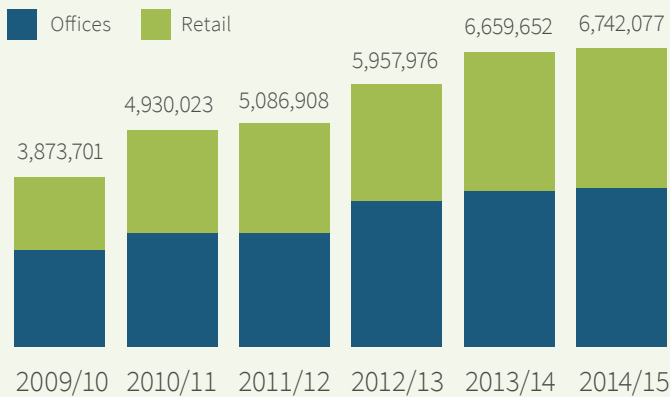
Number of participants



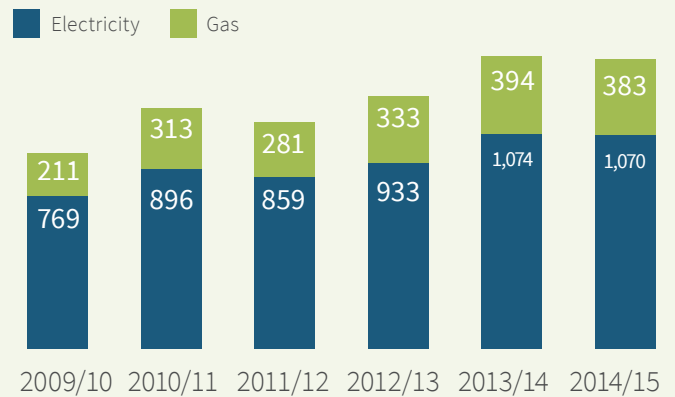
Number of properties



Floor area (m²)



Energy consumption (GWh)



The dataset reflects property churn within member portfolios, with properties leaving and entering the dataset over time. In 2014/15, the number of properties in the dataset reduced by 7%, whilst the floor area increased by 1.2%. This is because between the last two data collection periods smaller buildings have been sold and removed from the dataset whilst larger buildings have been purchased and included within the dataset.

Like-for-like savings²



Geographical coverage

The dataset for REEB is drawn from across the UK with 56% of all properties submitted between 2009/10 and 2014/15 coming from London and 44% from the rest of the UK.

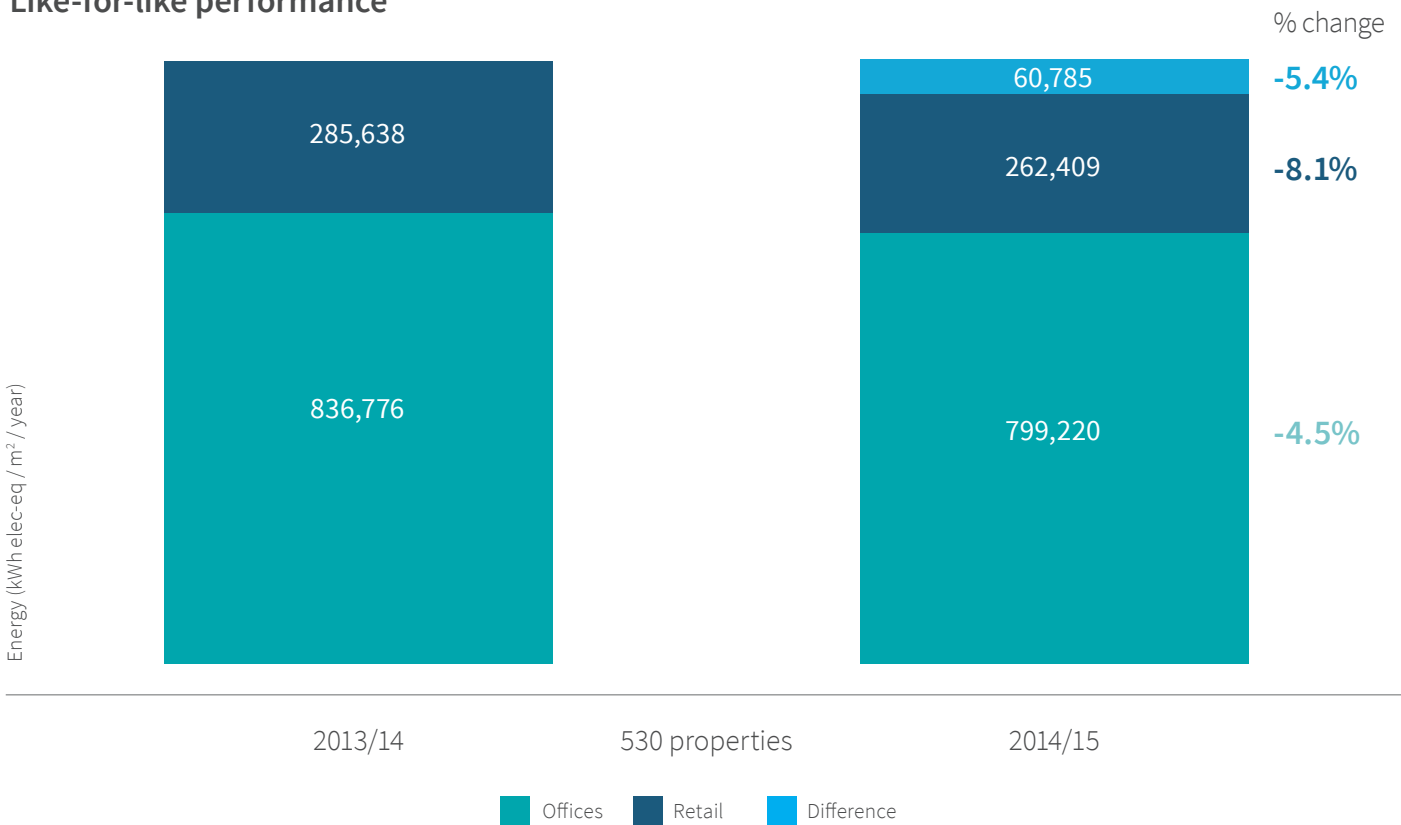


10 number of properties where over 10

Comparing apples with apples

LIKE-FOR-LIKE ENERGY CONSUMPTION HAS REDUCED BY 5.4% OVER THE LAST YEAR

Like-for-like performance



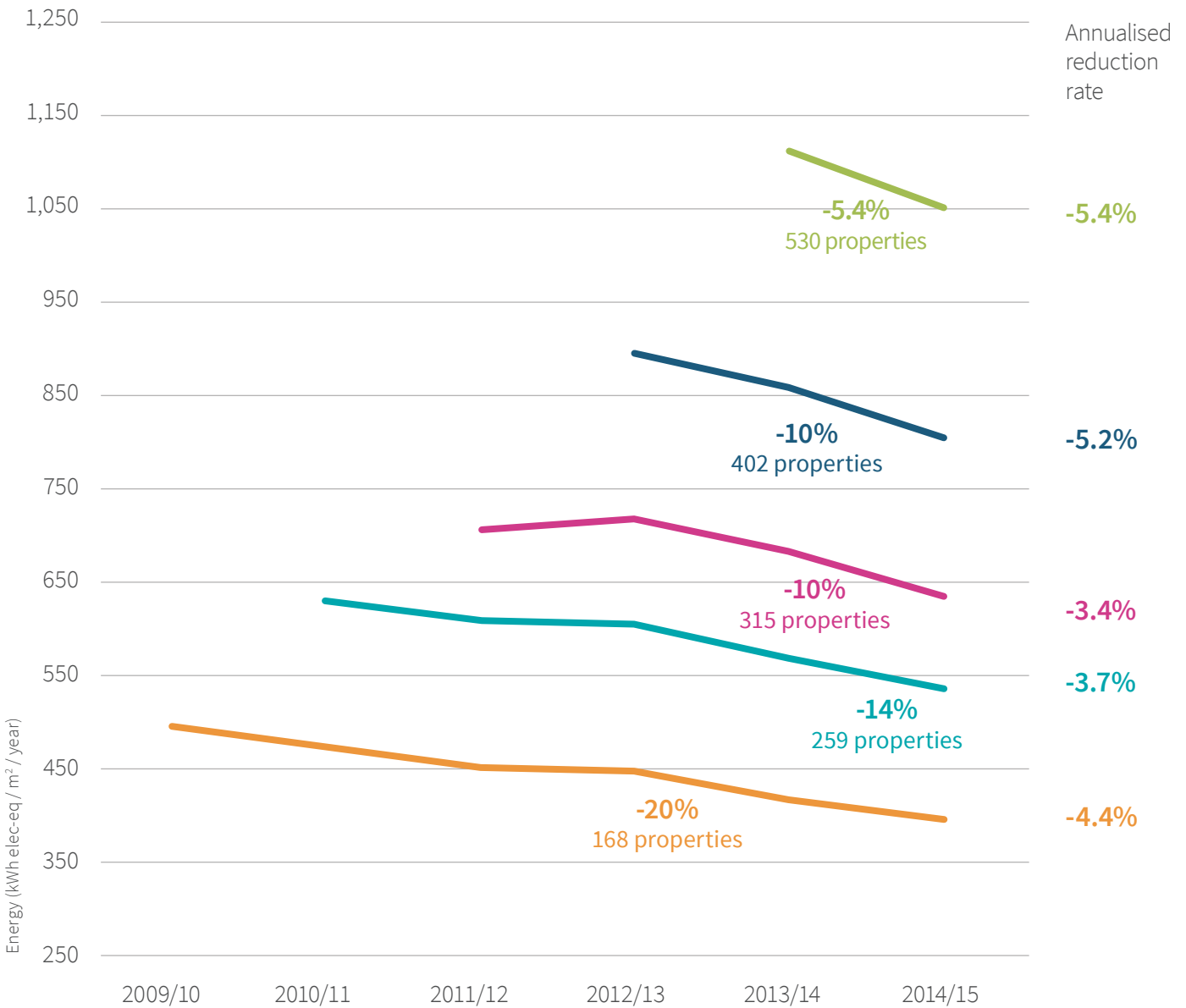
As property churn can influence the size and nature of the dataset, it is not always easy to understand the changes in performance over time. Like-for-like portfolio analysis makes it possible to assess performance using a consistent dataset. In 2014/15, 530 properties were analysed across two reporting years.

For these 530 properties, energy consumption reduced overall by an impressive 5.4%, with offices achieving a 4.5% reduction and shopping centres an even greater reduction of 8.1%. Such savings are achieved through a combination of efficient management practises, installing energy conservation measures and engaging with occupiers on the opportunities and benefits of reducing energy consumption.

When looking at like-for-like energy performance further back in time the energy savings are equally impressive. The chart overleaf shows the performance of a consistent set of properties starting at different base years. The further back in time the base year starts the smaller the sample of properties. The chart shows the overall energy reduction for each set of properties together with the annualised rates of reduction.

LIKE-FOR-LIKE ENERGY CONSUMPTION HAS REDUCED BY 20% SINCE 2009/10

Like-for-like performance over time



BBP members have achieved significant and sustained reductions in energy consumption for those properties they have retained over

time. Of the 168 properties included in the dataset since 2009/10, there has been a 20% reduction in energy use, equating to an annualised reduction rate of 4.4%.

Seeing the wood through the trees

OFFICES HAVE DECREASED THEIR ENERGY INTENSITY BY 28% SINCE 2009/10

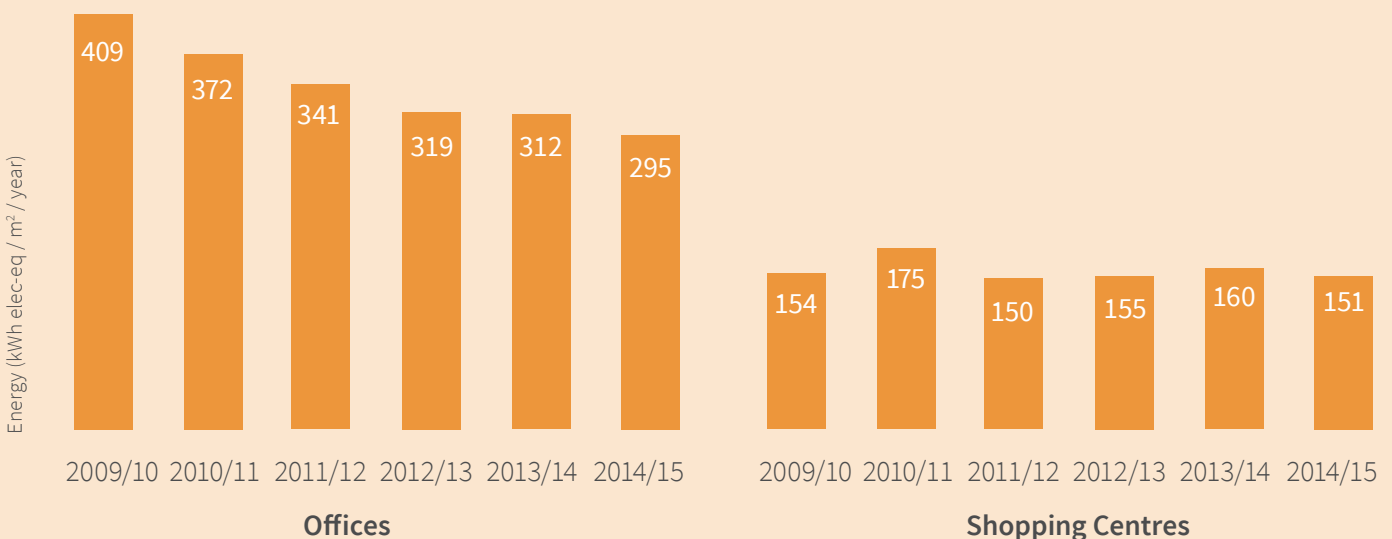
When assessing the performance of commercial properties, it is important to normalise the data to take into account factors which might influence or impact performance, such as floor area. This enables energy consumption to be set within the context of the size of the property and, at a portfolio level, the indicator can be used as a constant measure of efficiency, regardless of portfolio churn.

The most commonly used indicator in real estate is the energy intensity indicator of kWh per m² per year.³ This is now a well-established indicator used within industry reporting frameworks and benchmarking initiatives such as EPRA, GRESB, GRI and INREV. It is also recommended

within the [Green Property Alliance 'Establishing the Ground Rules for Property: Industry-Wide Sustainability Metrics' report](#) and [UK-GBC 'Delivering Building Performance' report](#). This indicator provides an excellent insight into the extent to which a property is using energy efficiently; the lower the intensity, the more efficient the use of energy.

Data can also be adjusted to take into account other factors that might influence consumption. The energy intensity analysis included in this report adjusts the data for weather and hours of operation. The methodologies for adjusting the data have been developed over several years with participating members and details are provided at the end of the report.

Energy intensity over time



The graph above shows that there is a clear trend of improving energy efficiency in offices. Energy intensity has improved by 28% over the past five years. Whilst office portfolios have a diverse range of occupiers,

they tend to carry out similar activities and therefore a combination of improvements to the properties, good energy management and occupier engagement can contribute to significant improvements in efficiency.

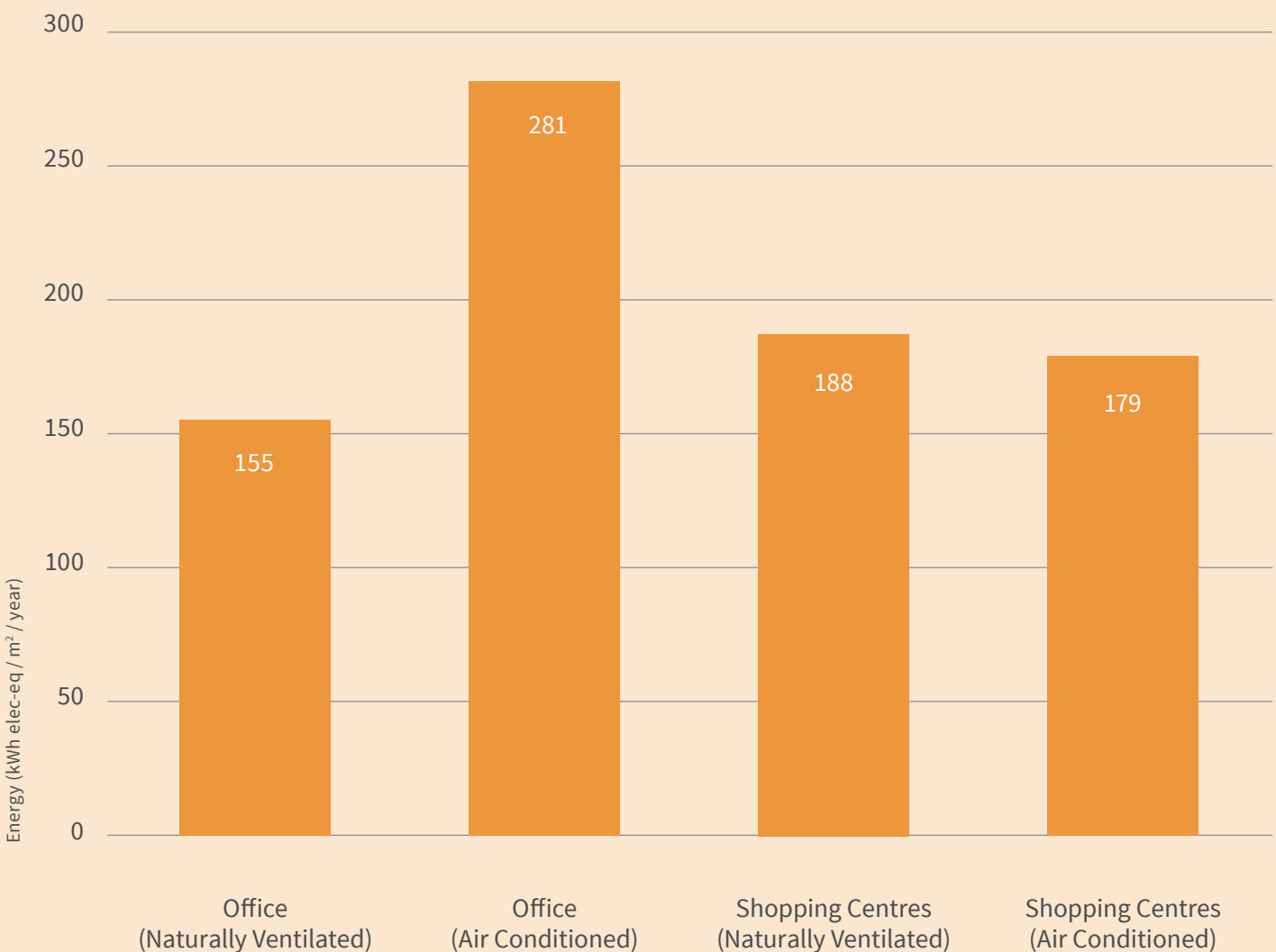
The shopping centre dataset shows much more erratic performance with energy intensity both increasing and reducing over time. However, overall energy intensity has fallen 2% over the five-year period. It is unclear why this is the case, but there are a number of possible influencing factors. Occupier consumption is typically not included and energy consumption in shopping centres is most influenced by lighting loads in common areas.

The average energy intensity in 2014/15 of BBP members' office and shopping centre portfolios are provided below.

This shows a significant difference in the energy intensity of naturally ventilated and air conditioned offices

as one would expect. The difference between the air conditioned and naturally ventilated shopping centres is less straightforward. Air conditioned centres within this dataset, on average, show a slightly better energy intensity. It is unclear why this is the case and will be an area of exploration in 2016. It may be the case that the existence of air conditioning is not an appropriate clarification criteria to compare energy efficiency in shopping centres, with energy efficiency strategies reducing the amount of time the plant is run. Alternatively, it may relate more to the age of the centre. Older centres are less likely to be air conditioned but may also have a legacy of older lighting systems yet to be upgraded.

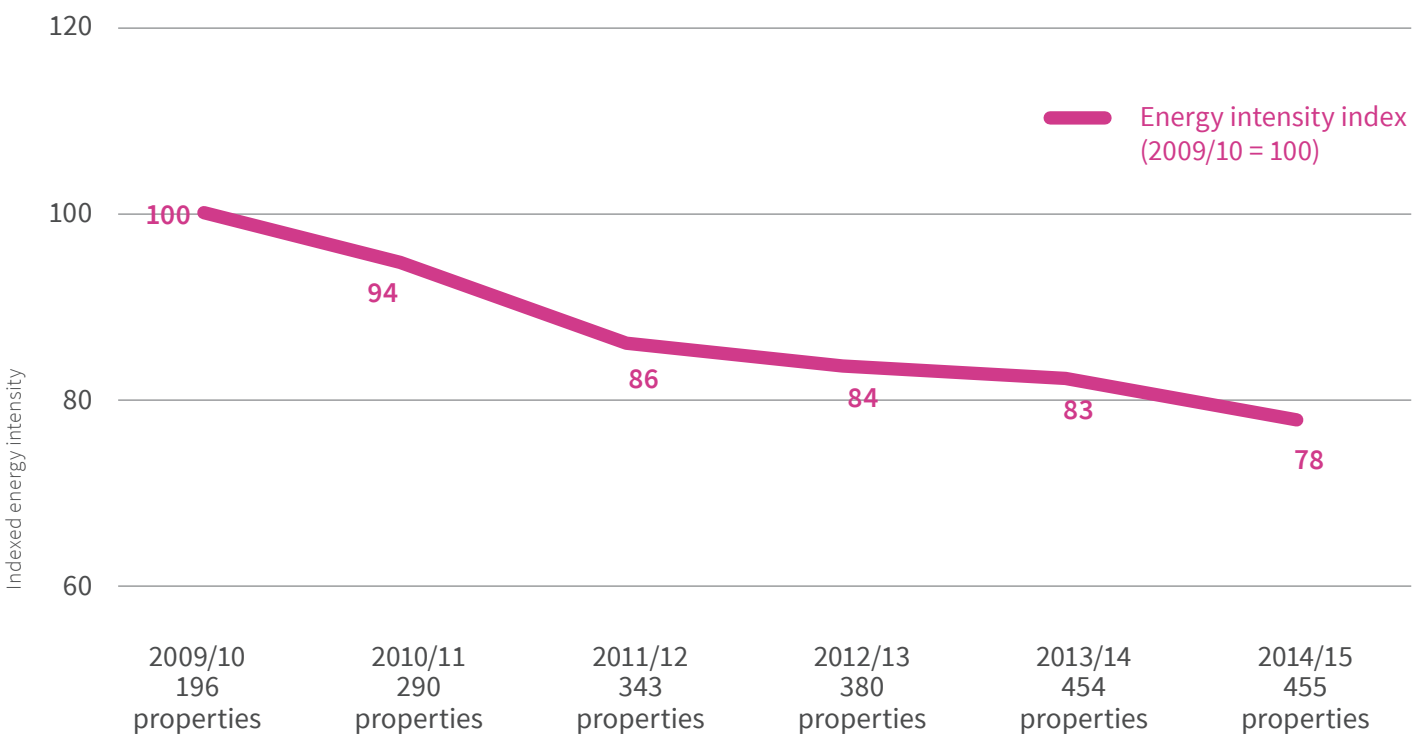
2014/15 energy intensity by property type



Intelligent indexing

THE EFFICIENCY OF THE BBP PORTFOLIO HAS IMPROVED BY 22% OVER THE PAST 5 YEARS

Indexed intensity trend⁴



Within the real estate sector, the dynamic nature of portfolios presents a challenge to reporting performance over time. Providing a simple, but robust, measure of performance is difficult without significant caveats concerning the scope and nature of the data and a shrinking dataset. This makes understanding and comparing the performance of whole portfolio performance a minefield.

In response, the BBP has taken an indexing approach to the dataset, enabling property owners to assess performance over time using an indexed intensity trend much as they would for other areas of performance such as total returns. By taking the average energy intensity of a portfolio from a chosen baseline year and selecting a starting value, in this case 100, the percentage change

in energy efficiency can be tracked over time. This can illustrate, regardless of portfolio churn, energy efficiency performance across whole portfolios in a robust way which allows for cross comparison between funds.

Results are particularly impressive with combined portfolios driving down energy intensity in every single year, achieving a 4% reduction in the past year and a 22% reduction over the past five years (an annualised rate of 4.9%). Such a reduction exceeds the targets set by the [Green Construction Boards Low Carbon Routemap](#) to achieve Government's target of an 80% carbon reduction by 2050. This indexing approach can also be helpful in enabling property owners to set long-term targets for their portfolios and assess progress over time.

Transforming the market

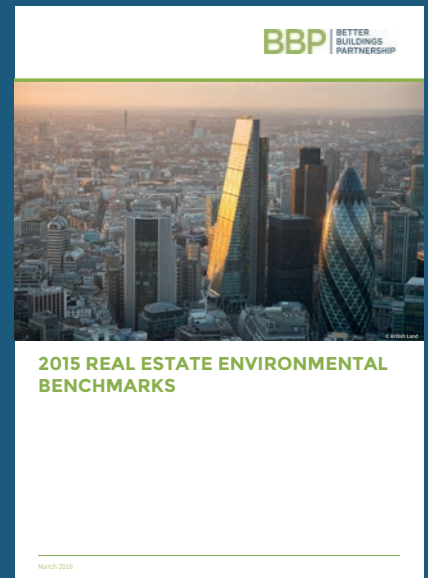
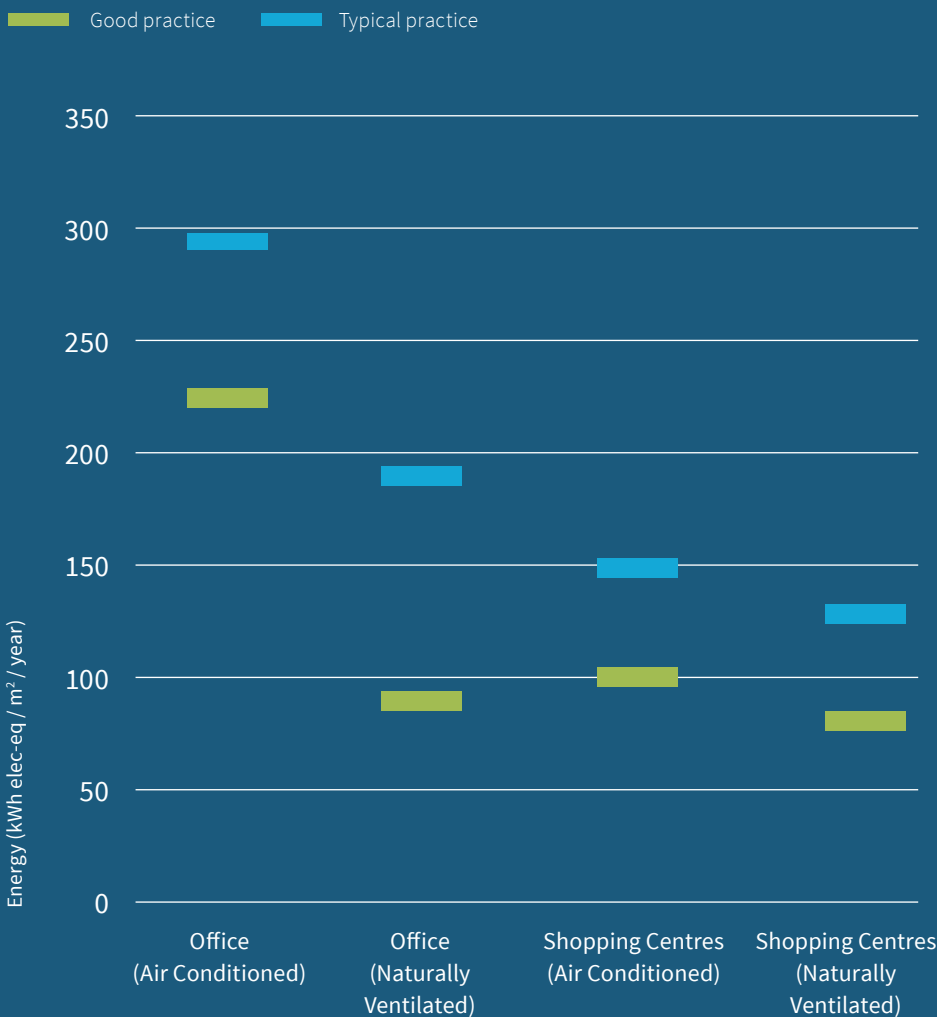
REEB has been developed by BBP members to help them measure and benchmark their performance against one another so that they can identify and target improvements across large commercial property portfolios. The BBP is a not for profit organisation that supports its members in their endeavours to improve the sustainability of their existing properties. But what about the rest of the industry?

The BBP is committed to sharing its knowledge and resources with the wider commercial property

industry in order to support the transformation of the market for a more sustainable future. The REEB methodology is publicly available for anyone to compare the performance of their properties against the REEB benchmarks. In 2016, the BBP will be developing an online platform with EnergyDeck to make this process much easier.

The BBP publishes a wide range of practical tools and guidance on its website, enabling everyone to access the collective knowledge and experience of those leading the sector.

Latest Real Estate Environmental Benchmarks



Download the benchmarks [here](#)

Technical notes for the technically minded

The methodology

The REEB methodology has continually evolved since the inception of the first REEB survey in 2009. This process is overseen by the BBP Sustainability Benchmarking Working Group and regularly reviewed to ensure that it reflects best practice in the measurement and reporting of energy consumption. The methodology is publicly available and can be used by anyone to compare the performance of their properties.

Data collection

- Collation of all necessary energy (electricity, gas and other major fuels) on an annual building level basis for all properties where participants have management control.
- The annual period for data collection is financial year Apr - Mar. However, calendar year data is accepted if this is the only period that members are able to provide data for.
- Only properties for which participants hold a full 12 months of data is submitted.
- Data collection is currently limited to managed offices, shopping centres and retail parks. Data is submitted on an individual building basis.
- Data is provided for the entirety of the buildings being submitted (although part building consumption can be provided for inclusion in absolute and like-for-like indicators). However where applicable and measurable a breakdown of consumption within the building should be provided, i.e.:
 - Consumption for tenant sub-metered areas
 - Consumption for specific building services (e.g. shared HVAC, lighting / small power, vertical transportation)
 - Consumption for specific separable parts of the building (e.g. data/comms rooms, restaurants, gyms etc.)
- Data on building characteristics and property level information is also provided for each building. At a minimum the following mandatory data points are required:
 - **Annual energy consumption:** kWh by type (electricity, fuels, thermals) and tenant consumption if metered separately
 - **Floor area:** Net Lettable Area (NLA) for all properties and Common Parts Area (CPA) for enclosed shopping centres
 - **Broad asset type** (office, shopping centre, retail & leisure) and subtype as per REEB categorisation
 - **Whole/part building energy data:** for offices submitted confirmation of whether landlord obtains all energy for the building
 - Typical weekly **core and additional operating hours:** used for normalisation
 - **Average annual vacancy rate** (offices only)
 - **Postcode:** used for degree day normalisation and for ensuring no duplication of properties in set up
 - **Worker numbers** (offices) and **annual visits** (retail)
- If waste and water data are to be submitted the minimum data points required are:
 - **Waste:** annual waste quantities (kg) by disposal route from site (aligned with GRI)
 - **Water:** annual water consumption (m3), [worker numbers (offices) and annual visits (retail) provided above are also used for normalisation in the water performance indicator]

Data validation

To ensure a level of accuracy and robustness in the results presented with REEB a holding pen is used to exclude individual properties and is implemented for the following:

1. Missing data (that is vital to the KPIs)
2. Unexplained / unconfirmed data anomalies
3. Energy intensity threshold cut-offs:
 - a. 30 kWh elec-eq / m² / year for naturally ventilated offices
 - b. 50 kWh elec-eq / m² / year for air-conditioned offices
 - c. 40 kWh elec-eq / m² / year enclosed non air-conditioned shopping centres
 - d. 30 kWh elec-eq / m² / year enclosed air-conditioned shopping centres
 - e. 0.4 kWh elec-eq / m² / year unenclosed shopping areas

Normalisations and adjustments

Weather adjustment

- Energy intensity performance indicators have been adjusted for weather. Weather-driven consumption has been taken account of by adjusting natural gas consumption to the UK 20-year degree-day average.
- It is assumed that 10% of natural gas consumption is for domestic hot water (e.g. hand washing), which is not affected by weather, and is thus not adjusted using heating degree-days.

Hours of operation adjustment

- For energy intensity performance extended opening hours that are atypical of the sample set have been taken account of by normalising all energy consumption at all properties to the survey norm for effective operating hours.

- Effective operating hours are defined as: 1 x Core Hours + 0.2 x Additional Hours. It is assumed that the survey norm for the energy requirement of additional hours is one fifth that of core hours. This is based on an analysis of best practice and half-hourly electricity demand profiles. The norms for offices are 60 for core and 10 for additional. The norms for retail properties are 72 for core and 18 for additional.

Per m² area of appropriate floor area

As the uses of the floor space changes by property type, the area used for normalisation must be more specific. For offices, net lettable floor space is used for normalisation, and common parts area is used for enclosed retail and net lettable floor area for unenclosed retail. For retail properties that can itemise car park energy through sub-metering or for unenclosed retail for which all energy is for use in car parks, car park spaces is used.

Vacancy rates

Only properties where whole building energy performance data is provided and occupancy rates are at least 75% are included when calculating energy intensity performance.

Conversion of other energy sources consumption to electricity equivalent

When referring to energy performance the metric used is kilowatt hours of electricity equivalent (kWh elec-eq). This converts all of the energy being used into electricity terms, by converting other fuel sources' kilowatt hours to their 'electrical equivalence' relative to their environmental, thermodynamic and financial ratio to electricity. All energies are then combined into a single kWh elec-eq for each building. The conversion factors used for REEB kWh elec-eq are: Electricity = 1, fuels = 0.4 and thermals = 0.5.

REEB participants

Acknowledgements

This report has been developed through the work and with the support of the BBP Sustainability Benchmarking Working Group. Data collection and analysis has been undertaken and reviewed by JLL. Special thanks goes to Matthew Tippet for all his efforts and support of the Real Estate Environmental Benchmark.











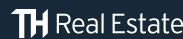















- 1 <http://www.betterbuildingspartnership.co.uk/our-priorities/measuring-reporting/real-estate-environmental-benchmark>
- 2 Assumed energy costs of 10p per kWh of electricity and 3p per kWh of gas.
- 3 When assessing energy intensity the BBP uses an indicator of kilowatt hours of electric equivalent per square metre of floor area per year (kWh elec. equ. per m² per year). Details of how this is calculated is provided within the methodology section.
- 4 The combined performance is based on a weighted average of both office and shopping centre portfolios