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2017 REAL ESTATE ENVIRONMENTAL BENCHMARKS

JANUARY 2018

What is the Real Estate Environmental Benchmark?

The Real Estate Environmental Benchmark (REEB) is a publicly available benchmark of operational environmental performance for commercial property in the UK. It is one of the only benchmarks based on the performance of buildings 'in-use' and is increasingly becoming the industry standard used by investors, fund managers and property owners to compare the performance of commercial properties across the UK.

Based on the annual utility consumption data of the commercial property portfolios of BBP members, this report provides energy and water performance benchmarks for offices, shopping centres, retail parks, leisure parks and car parks, which can be used by others to compare the performance of their buildings.

The benchmarks provide one of the most up to date reflections of industry performance; the benchmarks are based on a 3-year rolling average and are updated each year. Details outlining how the benchmarks are calculated are provided at the end of this report.

The REEB dataset is one of the most comprehensive concerning performance in-use. With the permission of BBP members, the data is made available on an anonymous basis to support a wide range of research projects in this important field.

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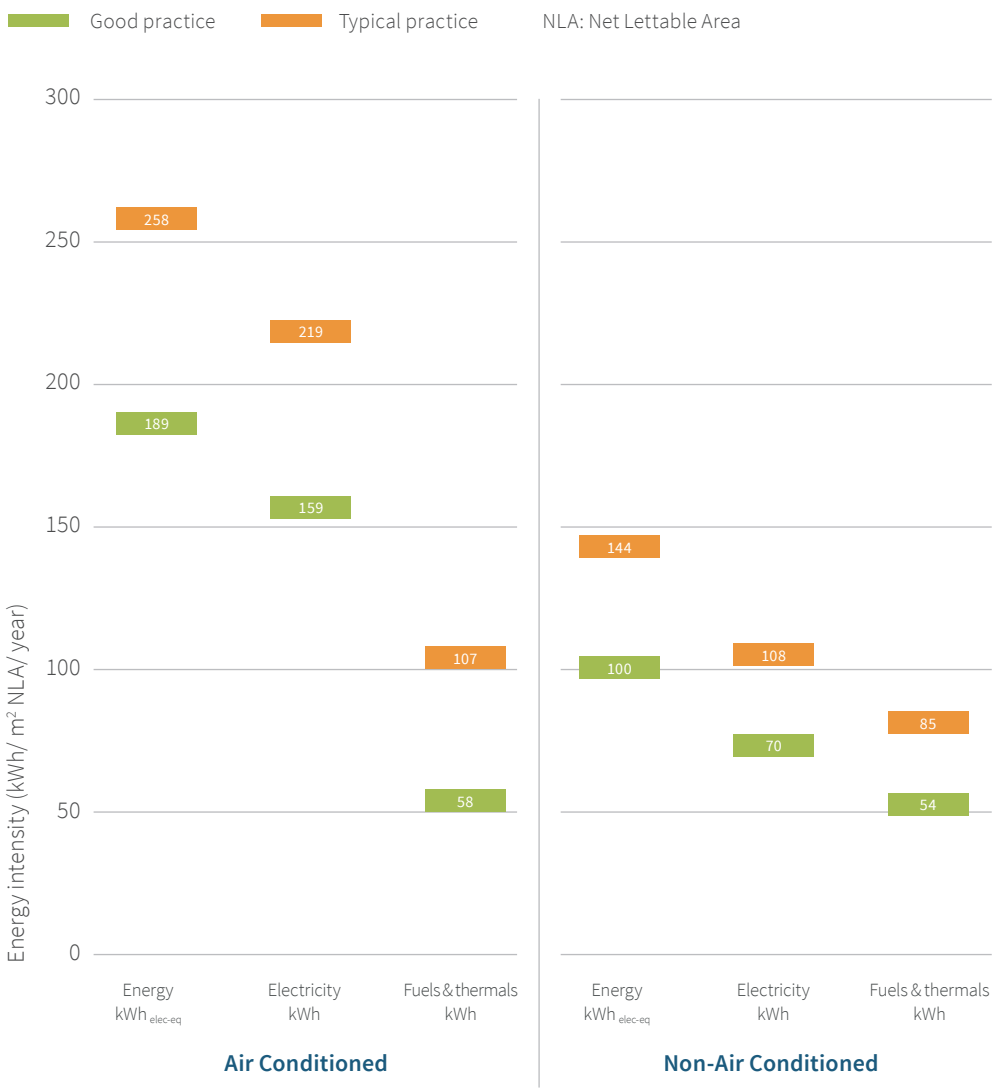
Energy Benchmarks – Offices

Energy Intensity



Energy Cost

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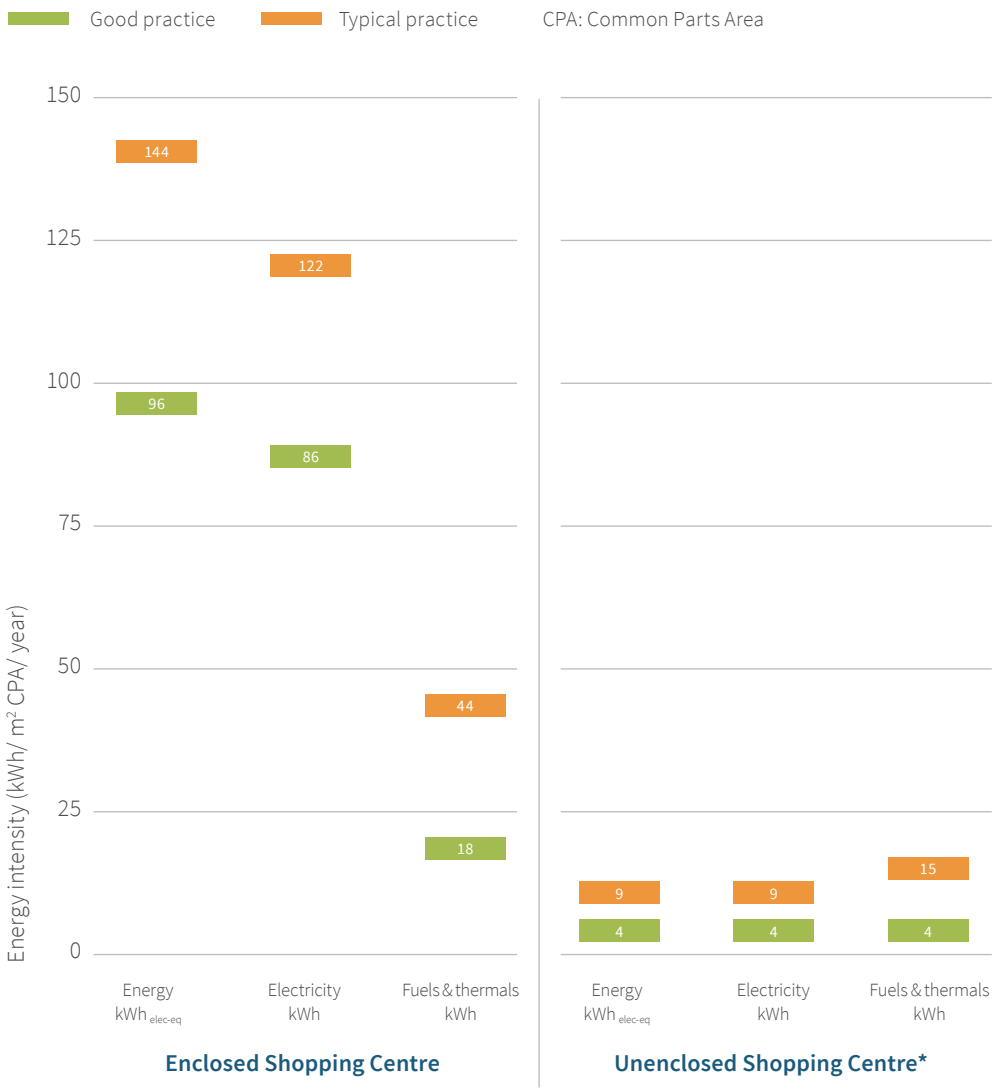
Energy Benchmarks – Shopping Centres

*Due to concerns over the energy intensity profile observed for this property type, further investigation into the data and methodology will be undertaken in 2018 to increase the level of confidence for unenclosed shopping centre benchmarks in future years.

Energy Intensity



Energy Cost

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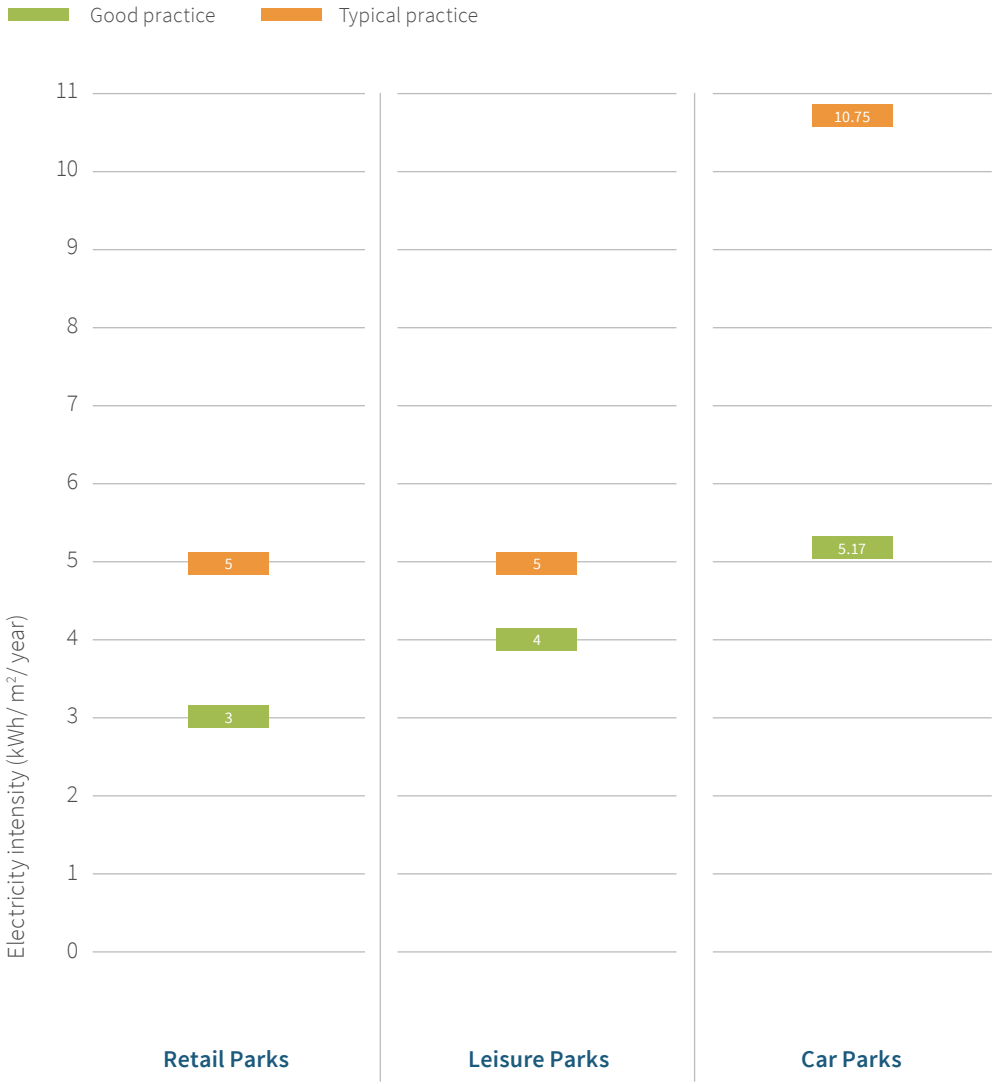
Energy Benchmarks – Retail Parks, Leisure Parks and Car Parks

Electricity Intensity



Electricity Cost

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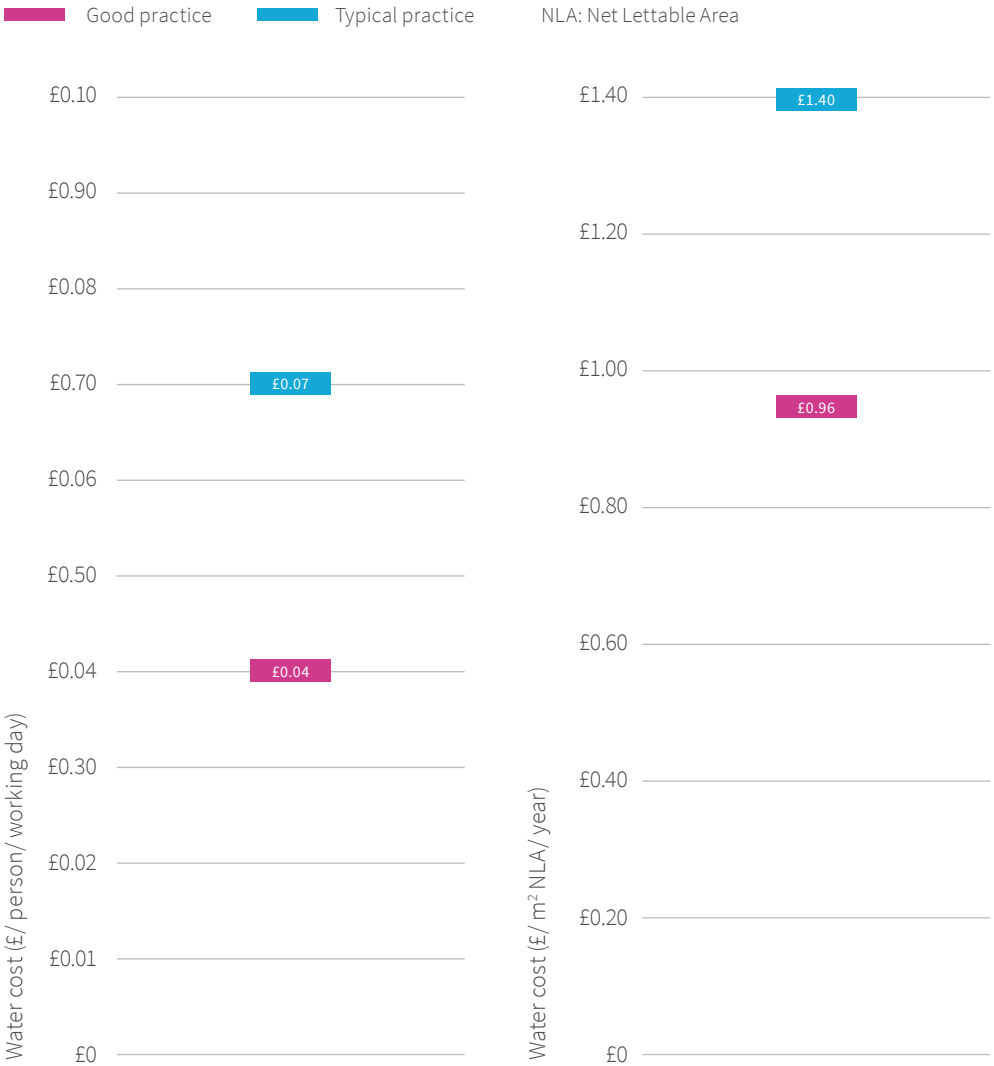
Water Benchmarks – Offices

Water Intensity

Water Cost



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Water Benchmarks – Enclosed Shopping Centres

Water Intensity

Water Cost

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Calculating the Benchmarks

Data Quality

- Properties included within benchmark calculations must meet strict data quality controls. The criteria for excluding properties are:
  - Properties with missing data that are vital to the analysis.
  - Properties that show abnormal changes between years or data anomalies that cannot be explained or confirmed by the submitting participant.
  - Properties with energy intensities below the following thresholds:
    - Non-air-conditioned offices: 30 $kWh_{elec-eq}$/ m^2/ yr,
    - Air-conditioned offices: 50 $kWh_{elec-eq}$/ m^2/ yr,
    - Enclosed shopping centres: 30 $kWh_{elec-eq}$/ m^2/ yr.

Offices

- Energy benchmarks are based on whole building data only. Buildings that submit only part building energy consumption are excluded.
- Energy benchmarks are based on offices which have an average annual occupancy rate of 75% or more.
- It is recognised that whole building energy intensity using NLA as the denominator is, to an extent, a mismatch between numerator and denominator (i.e. using NLA as opposed to Gross Internal Area (GIA) with whole building energy). However, NLA is used, as it is the most consistently available and accurate denominator from participants.
- For water benchmarks:
  - Persons = workers based on best available of either Full Time Equivalents (FTEs) or actively used workstations.
  - Working days = 260 per year.

Shopping Centres

- Data for both enclosed and unenclosed shopping centres, excludes occupier and car park energy consumption. Specifically for unenclosed shopping centres, the energy consumption relates to external lighting, service yard etc.
- The denominator used for the shopping centres is CPA. In the case of unenclosed shopping centre, where CPA is not available, External Area (given as Gross Plot Area minus Building Footprint) is used.
- For water benchmarks (enclosed shopping centre): Persons = footfall numbers.

Retail and Leisure Parks

- Retail and Leisure Park data excludes occupier energy consumption and relates to energy consumption of the external area.
- The denominator used is the number of car park spaces, which is then converted into area. Each car park space represents 25m^2 (based on BCSC Guidance Note 76 – Construction Costs of Shopping Centre Car Parks).
- As a denominator, it is recognised that car parking spaces may not be the most accurate numerator. However, in the absence of a more suitable denominator that is consistently available and accurately recorded by participants, this is seen as the best alternative.

Adjustments

- Electricity equivalent ($kWh_{elec-eq}$) = kWh of electricity equivalent. Electricity 'equivalence' is calculated to reflect the approximate thermodynamic differences between electricity, fuels and heat. The ratio for fuels is the same as the ratio of Climate Change Levy rates for gas and electricity from 01 April 2019. The kWh of electricity equivalent metric can be applied across time and globally and so facilitates historical and international comparisons of energy efficiency. Electricity = 1, fuels = 0.4 and thermals = 0.5.
- Fuels and thermal energy consumption for heating is adjusted for weather.
- No adjustments are made for hours of operation.
- Energy costs are based on the tariff rates of 11p per kWh for electricity and 3p per kWh for natural gas. Water costs are based on the tariff rate of £2.00 per m^3 of water.

Calculation methodology

- Property submissions from the past 3 years are selected.
- Properties that fail any data quality controls are excluded.
- All annual data submissions not excluded are considered "eligible annual data submissions".
- The energy intensity figures (adjusted for weather-driven heating) for each eligible annual data submission is selected. Where an individual property has two or three eligible annual data submissions, the mean energy intensity is calculated and used for that property.
- These properties and intensities form the final dataset on which quartile analysis is performed to produce the benchmarks as follows:
  - REEB Typical Practice = median (50^{th} percentile)
  - REEB Good Practice = upper quartile (25^{th} percentile)

Sample size

The figures below represent the total number of properties used to create each benchmark category. Properties are only included where they meet the data quality controls. Where an individual property has submitted valid data for the past two or three years, the average intensity for that property is used. As a result, such properties are only represented once within the sample set, when calculating the benchmarks. The dataset will grow as we update the benchmarks annually.

- Offices
  - Energy: 391 air-conditioned; 38 non air-conditioned
  - Water: 281 (per person); 373 (per m^2)
- Enclosed Shopping Centres:
  - Energy: 111
  - Water: 110 (per person); 146 (per m^2)
- Unenclosed Shopping Centres: 60
- Retail Park: 94
- Leisure Parks: 37
- Car Parks: 24

REEB 2017 participants

Acknowledgements

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