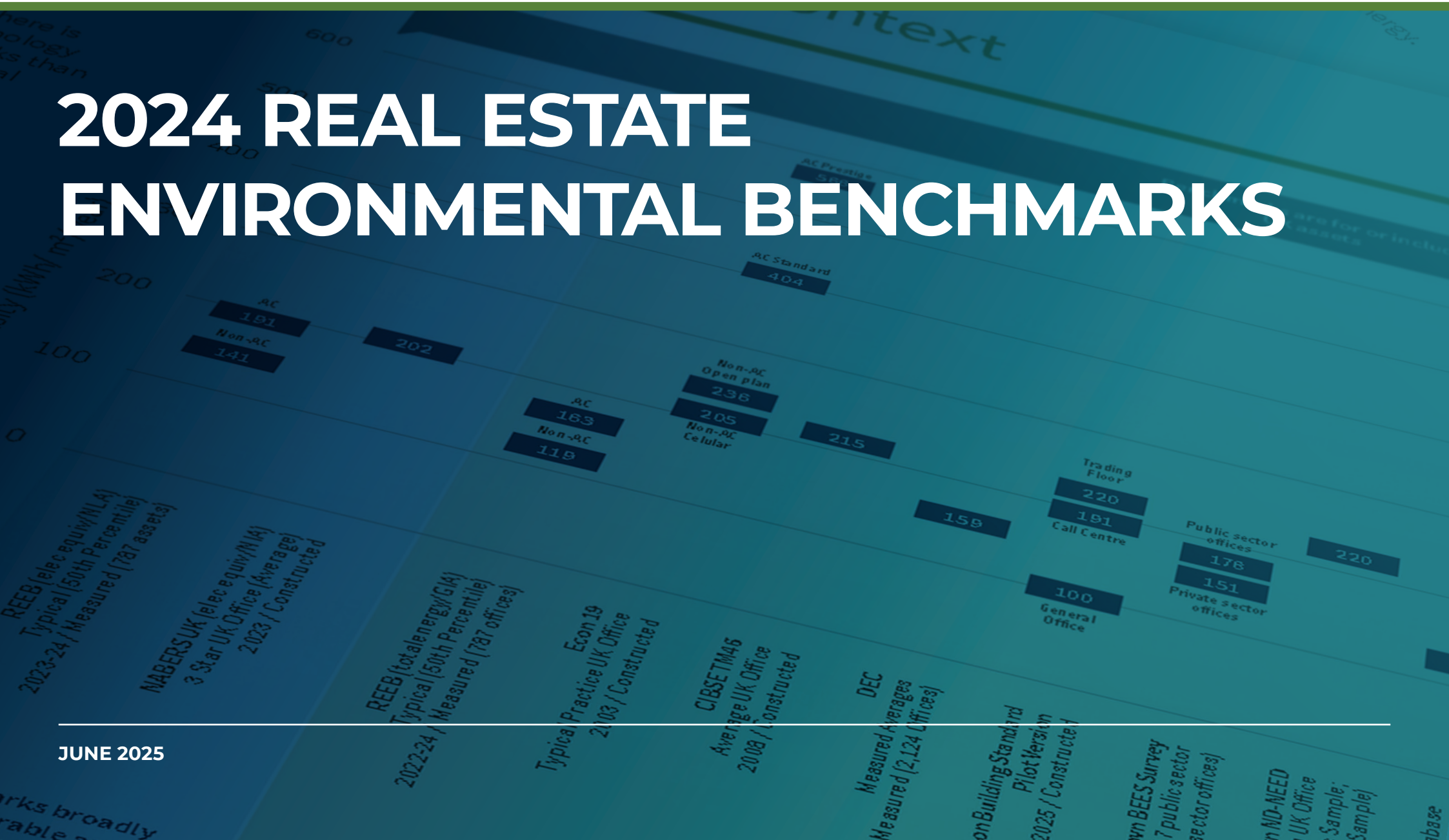
BBP | BETTER BUILDINGS PARTNERSHIP

2024 REAL ESTATE ENVIRONMENTAL BENCHMARKS



JUNE 2025

Introduction

What is the Real Estate Environmental Benchmark?

The Real Estate Environmental Benchmark (REEB) is a publicly available benchmark of operational environmental performance for commercial properties in the UK. It is based on the annual utility consumption data of the commercial property portfolios within the BBP membership. This report provides energy performance benchmarks for offices, shopping centres, shopping villages, retail parks, leisure parks, and industrial parks, which can be used to understand the performance of any building similar to these types. With the permission of BBP members, the data is made available on an anonymous basis to support the industry as a whole, and a wide range of research projects and initiatives.

What's new for this years' update?

The post-pandemic Context remains relevant to our sampling approach

This report provides a second update of the energy benchmarks since the covid-19 pandemic, and that context remains significant to the benchmarks, which remain significantly below the pre-pandemic values. In many cases, average energy intensities continue to decrease, albeit not to the same extent as in last years' update. The BBP took the decision not to publish benchmark values using the 2020-21, or 2021-22, and therefore last years' update only used post-pandemic data from 2022-23, rather than using the default methodological approach of using a '3-year rolling average' of the energy intensity data for each building. This ensured that last years' benchmarks were not affected by reporting years directly affected by government lockdowns, but restricted the sample sizes underpinning the benchmarks. This year, we can take a '2-year rolling average' of post-pandemic data, which helpfully increases the sample size for the benchmarks, and we anticipate this growing further in next years' update when we will again be able to use a '3-year' dataset.

Expansion of REEB In Context

Last year we introduced the 'REEB in Context' section to this report. Benchmarks from REEB were first produced in 2010, when very few other benchmarks were available to commercial property owners and managers to understand the relative performance of their buildings. Today the context is very different, with various energy & carbon benchmarks available in the UK and internationally for different building types. The challenge is perhaps no longer the availability of benchmarks, but making sense of them in an evolving commercial and regulatory environment where appraising the environmental performance of buildings has never been more important. This section continues to expand in this update, with new sources of benchmark information added to best summarise the current landscape.

New section on Regulatory Reporting of Energy Intensity

Most of the initiatives referenced in this report are voluntary, but trends towards mandatory reporting & disclosure of energy intensity are well underway, and over time we anticipate that these will provide new sources of energy intensity data for real estate. These sources of data will become increasingly important to the energy benchmarking landscape, and this new section of the report summarizes some of the key initiatives and how energy intensity metrics are included.

We hope that you find this report useful and welcome any feedback to info@betterbuildingspartnership.co.uk

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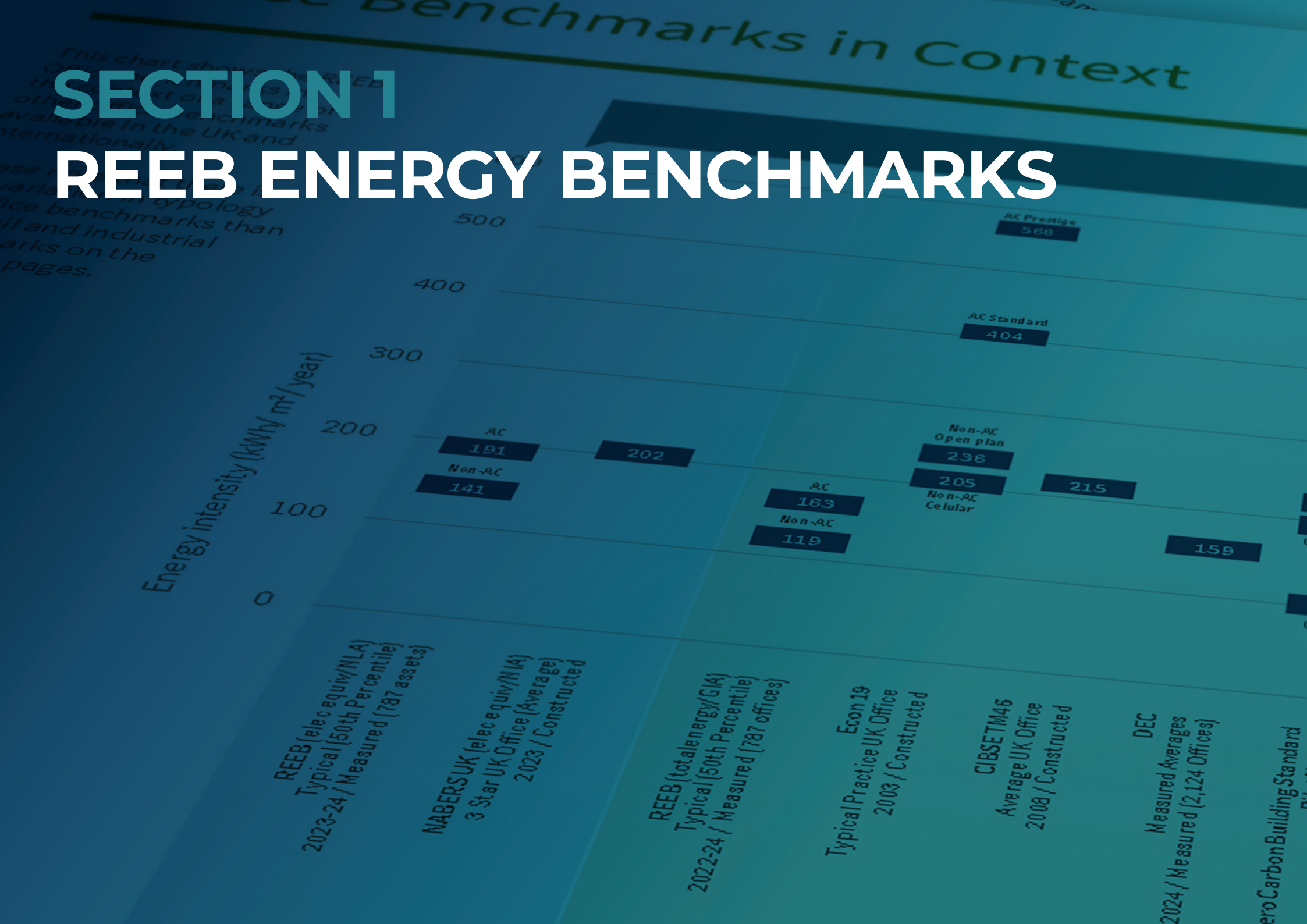
SECTION 1

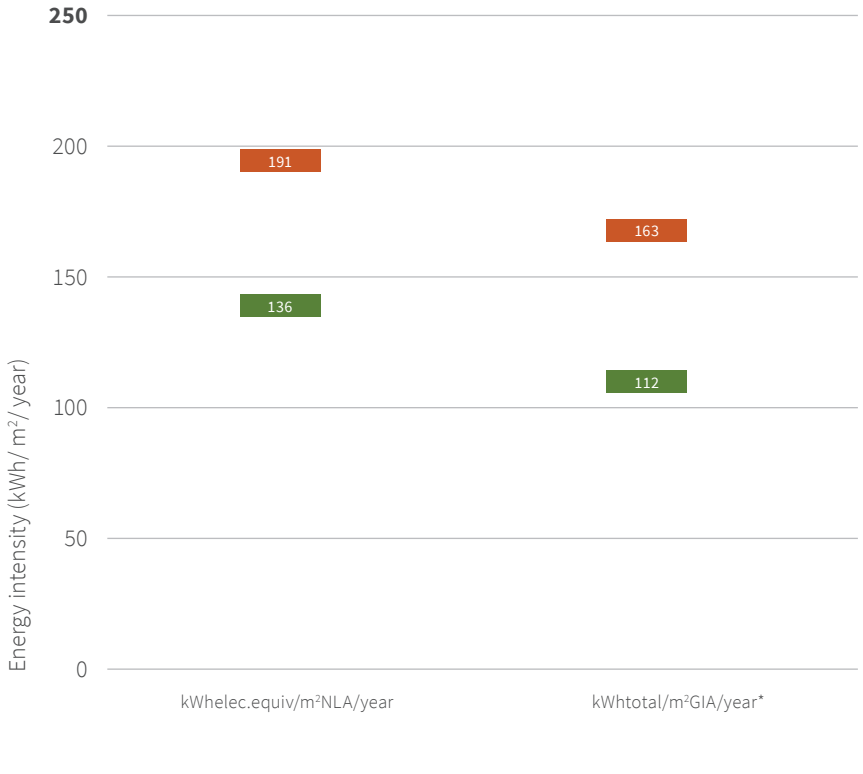
REEB ENERGY BENCHMARKS



Energy Benchmarks – Offices

Offices (A property with single or multiple tenants used to conduct commercial business activities)

Benchmarks are 'whole building' (i.e. common parts and tenant-occupied areas), but exclude mixed use elements such as retail spaces, gyms and data servers. Where offices include dealing floors these are removed from the total consumption. **Only offices that are >75% let for the reporting year are included**. The floor area metrics used are 'Net Lettable Area' for presentation as 'Electricity Equivalent per m² per year', and 'Gross Internal Area' for presentation as 'Total Energy kWh per m² per year'. These floor areas exclude non-office aspects of the building.



*Benchmark breakdown for AC Offices:
- 174 all-electric offices: TP 109; GP 85
- 536 offices using fuels: TP-Elec 119 TP-Fuel 58; GP-Elec 87 GP-Fuel 29

**Benchmark breakdown for NV/MM Offices:
- 16 all-electric offices: TP 106; GP 70
- 61 offices using fuels: TP-Elec 77 TP-Fuel 41; GP-Elec 53 GP-Fuel 22

25th Percentile (Good practice)
50th Percentile (Typical practice)

NLA Net Lettable Area
CPA Common Parts Area

Air Conditioned Offices

Definition: Mechanically Ventilated and/or Air-Conditioned properties are fully sealed and controlled via a combination of components required to provide full control of temperature, humidity and air quality. This includes fixed self-contained systems such as split units and centralised systems. Mechanical ventilation systems that provide no mechanical cooling but serve spaces that are cooled by other means are included within this HVAC category. Air conditioning is often provided by Air Handling Units (AHU) connected to ductwork that supplies air to and extracts air direct from within a space. AHU that consist of only a fan and a heating or cooling element located within the space they serve, known as Fan Coil Units (FCU) are also included here. Cooling itself could be generated either within the unit itself or can be provided by connection to central chillers.

Sample size for benchmarks above: 710
Total sample across 2022/23-2023/24 (unique assets): 1,429

Naturally Ventilated / Mixed Mode Offices

Definition: Naturally ventilated offices employ openable windows, skylights and such other openable systems (either manually or automatically controlled), to supply and remove air from the building without any mechanically assisted ventilation. Mixed mode buildings employ a hybrid approach to space conditioning that uses a combination of natural ventilation from openable windows (either manually or automatically controlled) and mechanical systems that include air distribution equipment which may also include refrigeration equipment for cooling. A mixed-mode building uses air-conditioning only when and where it is necessary, optimising the use of natural ventilation whenever it is feasible.

Sample size for benchmarks above: 77
Total sample across 2022/23-2023/24 (unique assets): 248

Energy Benchmarks – Shopping Centres

Shopping Centres (Retail properties with a central common mall and adjoining retail units)

Benchmarks represent the 'common parts' of the property, excluding all retail unit and car park energy consumptions. The floor area metric used is 'Common Parts Area', which includes the landlord-controlled mall and circulation spaces (e.g. staircases, elevators, lifts, and service / storage areas). For unenclosed shopping centres the 'Common Parts Area' may also include external walkways and open/semi-covered courts. 'Common Parts Area' is used as the denominator whether the energy consumption is expressed in electricity equivalent or total energy.

*Benchmark breakdown for Encl. AC:
- 8 all-electric centres: TP 64; GP 63
- 27 centres using fuels: TP-Elec 79 TP-Fuel 9; GP-Elec 51 GP-Fuel 5

**Benchmark breakdown for Encl. NV/MM:
- 6 all-electric centres: TP 104; GP 74
- 15 centres using fuels: TP-Elec 93 TP-Fuel 16; GP-Elec 50 GP-Fuel 6

**Benchmark breakdown for Unenclosed:
- 7 all-electric centres: TP 132; GP 34
- 7 centres using fuels: TP-Elec 52 TP-Fuel 10; GP-Elec 31 GP-Fuel 4

25th Percentile (Good practice)
50th Percentile (Typical practice)

NLA Net Lettable Area
CPA Common Parts Area

Enclosed Shopping Centres (Air Conditioned)

Definition: An enclosed retail property that includes a central common mall area and adjoining retail units. The retail units typically do not have any independent access and are accessed through the common mall area. Such properties are typically not accessible to the public after closing hours. These enclosed shopping centres are mechanically Ventilated and/or Air-Conditioned as per the detail above for offices.

Sample size for benchmarks above: 35
Total sample across 2022/23-2023/24 (unique assets): 46

Enclosed Shopping Centres (Naturally Ventilated / Mixed Mode)

Definition: An enclosed retail property that includes a central common mall area and adjoining retail units. The retail units typically do not have any independent access and are accessed through the common mall area. Such properties are typically not accessible to the public after closing hours. These enclosed shopping centres are naturally ventilated / mixed mode as per the detail above for offices.

Sample size for benchmarks above: 21
Total sample across 2022/23-2023/24 (unique assets): 33

Unenclosed Shopping Centres

Definition: A partially open retail property that includes a central common mall area. The common mall area is not fully sealed e.g. there is a roof but open entrances, and therefore accessible to the public after store closing hours.

These unenclosed shopping centres typically have no centralised heating or ventilation.

Sample size for benchmarks above: 14
Total sample across 2022/23-2023/24 (unique assets): 25

Energy Benchmarks – Shopping Villages, Retail Parks & Leisure Parks

Shopping Villages, Retail Parks & Leisure Parks (Out-of-town destinations or open-air facilities including retail and leisure activities)

Benchmarks include the energy consumption associated with the lighting of external areas, service yards, open-air car parks, and external landscaped area and walkways. **They exclude the energy consumption associated with retail units, or any covered/multi-storey car parks**. The floor area is based on the area of open air parking (calculated using the car park numbers multiplied by 25m²). In the case of Shopping Villages the floor area also includes the Common Parts Area (pedestrianised streets, service yards, external landscaped areas). The floor area denominators are the same whether the energy consumption is expressed in electricity equivalent or total energy.

Shopping Villages

Definition: A shopping destination characterised by rows of shops/retail units that are accessed via open pedestrianised streets and are located within well landscaped areas. The car park where present is generally located on an adjoining site, but a small amount of car parking may exist around the shops as well.

Sample size for benchmarks above: 14
Total sample across 2022/23-2023/24 (unique assets): 21

Retail Parks

Definition: An out-of-town, open-air retail facility that comprises mainly medium and large-scale specialist retailers. It is characterised by mostly free-standing properties, with ample on-site parking located in front of the stores and/ or around the site at ground level.

Sample size for benchmarks above: 191
Total sample across 2022/23-2023/24 (unique assets): 291

Leisure Parks

Definition: An out-of-town, open-air leisure facility, that may also include some retail units. Similar in nature to a Retail Park, but includes facilities such as bowling, cinemas etc. It is characterised by mostly freestanding, with ample on-site parking located in front of the stores and/or around the site at ground level.

Sample size for benchmarks above: 43
Total sample across 2022/23-2023/24 (unique assets): 70

* Whole sample 'all electric'

25th Percentile (Good practice)
50th Percentile (Typical practice)

NLA Net Lettable Area
CPA Common Parts Area

Energy Benchmarks – Industrial Parks

Industrial Parks

Benchmarks include the energy consumption associated with the open-air car park, service yard and any external landscaped areas. **They exclude any energy consumption associated with any of the buildings on site**, and any multi-storey car parks. The floor area is based on the external area, given as 'Gross Plot Area' minus Building Footprint. The floor area denominator is the same whether the energy consumption is expressed in electricity equivalent or total energy.

Industrial Parks

Definition: A site that contains multiple, free standing office or logistics buildings grouped together. On-site parking is typically located in front of each building and/ or around the site. Landscaped areas may also exist within the site.

Sample size for benchmarks above: 133
Total sample across 2022/23-2023/24 (unique assets): 223

* Whole sample 'all electric'

25th Percentile (Good practice)
50th Percentile (Typical practice)

NLA Net Lettable Area
CPA Common Parts Area

Producing the REEB Benchmarks

Calculation Methodology

- As described in the introduction, the benchmarks presented in this document take a '2-year rolling average' of post-pandemic data. Where an asset appears in both years, its average performance is used in the benchmark sample. Where an asset appears in only one of either reference year, that data point is used in the benchmark sample.

- Properties that fail any data quality controls are excluded. This includes:
  - 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 data provider.
  - Properties that exceed Energy Intensity High/Low Thresholds without suitable explanation from the data provider. Table 1 shows the thresholds that are applied.

Adjustments

- Electricity equivalent (kWhelec-eq) = kWh of electricity equivalent. Electricity 'equivalence' is calculated using the ratio of primary energy of each fuel compared to electricity. It combines into kWh of electricity equivalent, measuring the amount of electricity used and adding an equivalent amount to account for any other fuels used. Table 2 provides the co-efficient factors used to convert the fuel types. These factors were based on preparatory work conducted by BRE whilst developing the SAP 10.2 methodology.

- REEB office area data is quoted as Net Lettable Area (NLA) or Gross Internal Area (GIA) in various sections of this report, where the latter also includes the common parts associated with the office space. If participants provide only NLA or GIA, the other area field is calculated for use in the analysis using a conversion factor assuming that NLA is approximately 0.8 of GIA.

- Fuels and thermal energy consumption for heating is not adjusted for weather or operating hours.

Future Development Priorities

- Clarification of REEB methodological differences with other initiatives where BBP members are providing data

- Ongoing improvement of data coverage in the context of whole building/partial building distinctions and energy data types used

- Ongoing improvement of area data used and further alignment with IPMS

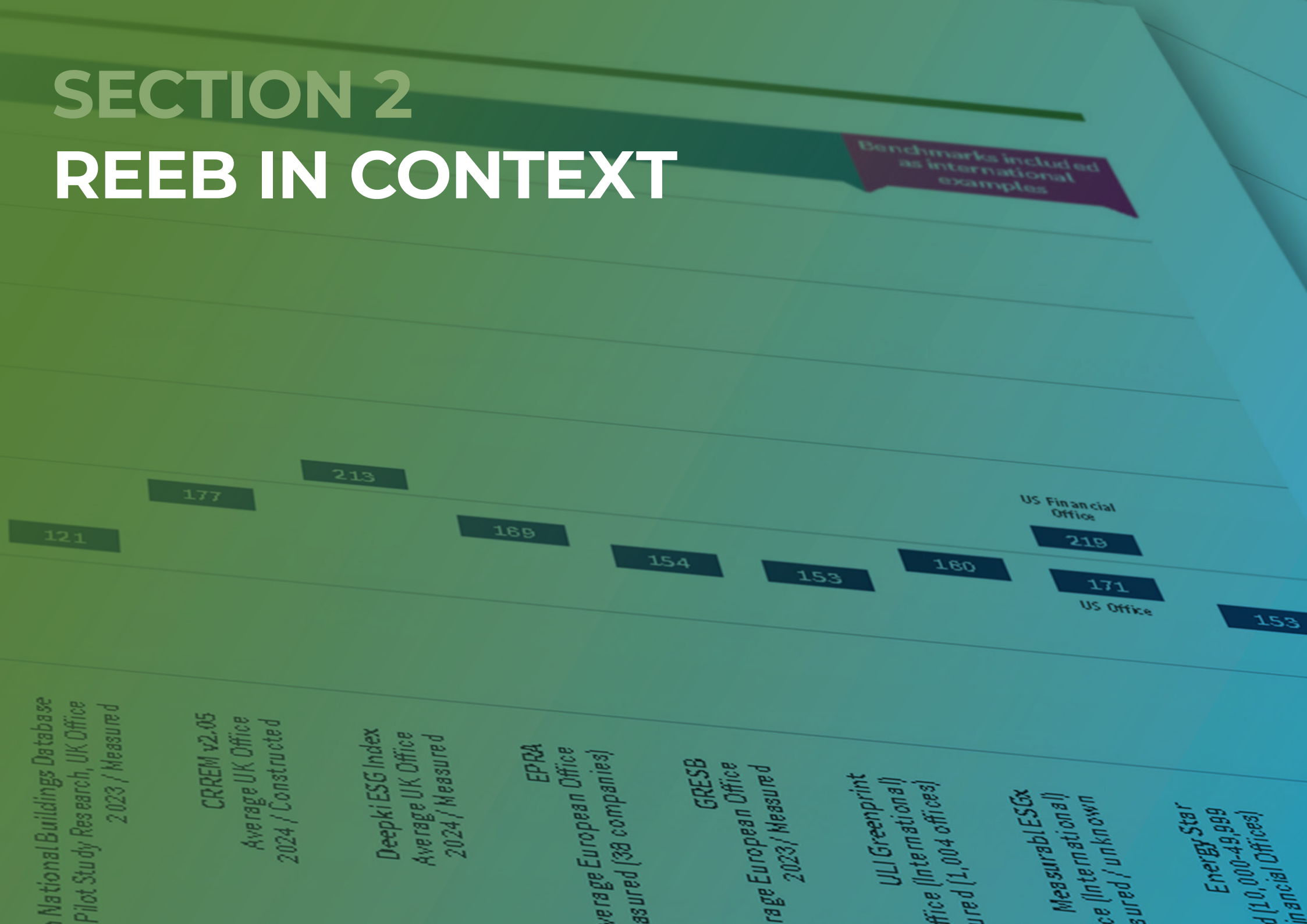
Table 1: High/low thresholds for energy intensity applied as part of data

Property Type	Lower Threshold ($kWh_{.elec.eq}/m^2$/year)	Higher Threshold ($kWh_{.elec.eq}/m^2$/year)
Office (Non-Air Conditioned)	30	600
Office (Air Conditioned)	50	1000
Enclosed Shopping Centre (Non-Air Conditioned)	30	600
Enclosed Shopping Centre (Air Conditioned)	30	600
Unenclosed Shopping Centre	0.4	400
Shopping Village	-	150
Retail, Leisure and Industrial Park	-	50

Table 2: Factors for converting to Electricity Equivalent

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Gas / LPG	0.45	0.47	0.46	0.47	0.49	0.53	0.56	0.59	0.66	0.70	0.72	0.75	0.75	0.76
Fuel oil	0.47	0.49	0.48	0.49	0.52	0.56	0.59	0.61	0.69	0.73	0.75	0.79	0.79	0.80
Wood pellets	0.54	0.56	0.55	0.57	0.59	0.64	0.67	0.70	0.79	0.84	0.86	0.90	0.90	0.91
District heating	0.55	0.56	0.55	0.57	0.59	0.64	0.67	0.71	0.79	0.84	0.86	0.91	0.90	0.91
District cooling	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40

SECTION 2
REEB IN CONTEXT



REEB in Context

The Real Estate Environmental Benchmark (REEB) was first produced in 2010, when very few other benchmarks were available to commercial property owners and managers to understand the relative performance of their buildings.

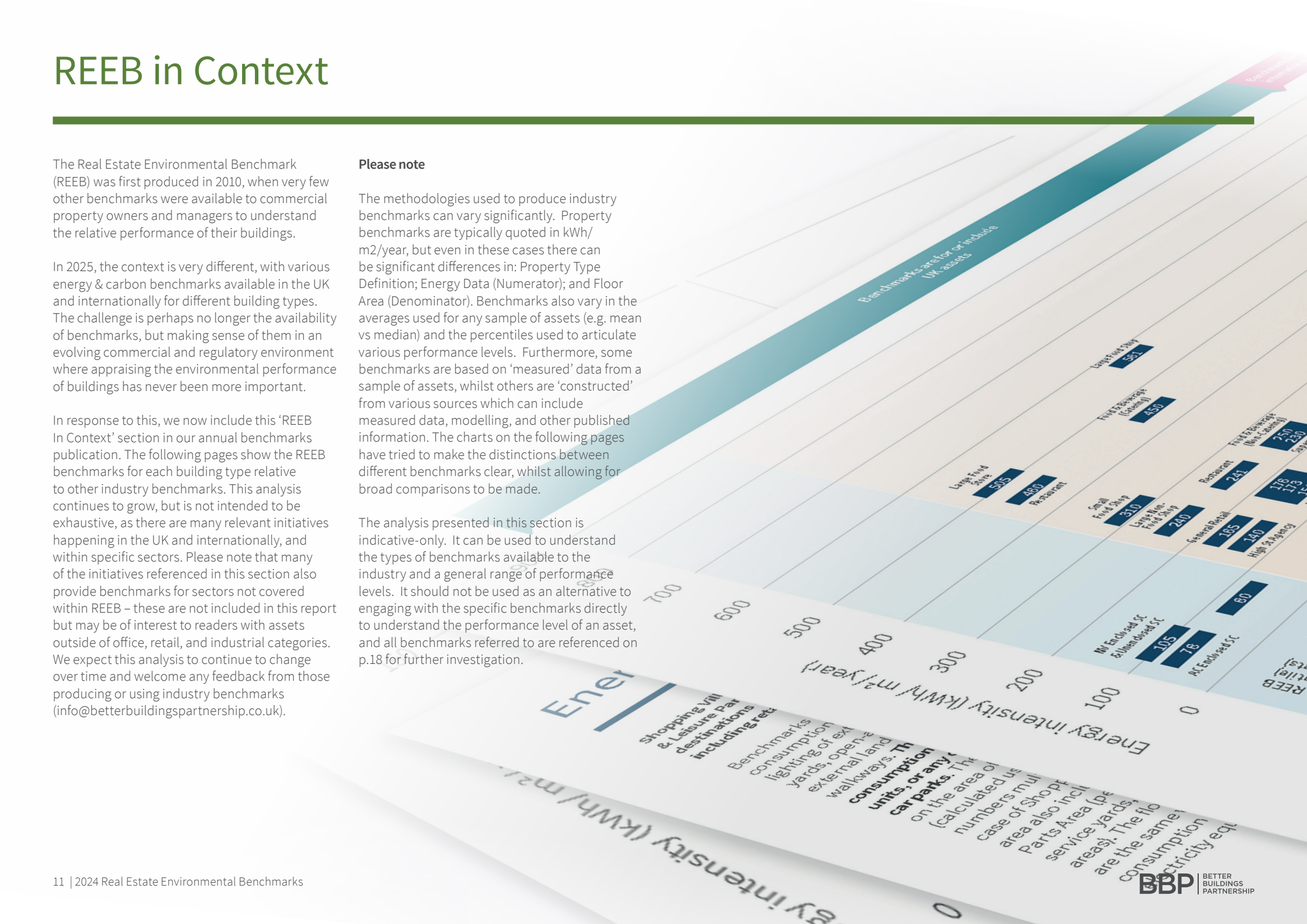
In 2025, the context is very different, with various energy & carbon benchmarks available in the UK and internationally for different building types. The challenge is perhaps no longer the availability of benchmarks, but making sense of them in an evolving commercial and regulatory environment where appraising the environmental performance of buildings has never been more important.

In response to this, we now include this 'REEB In Context' section in our annual benchmarks publication. The following pages show the REEB benchmarks for each building type relative to other industry benchmarks. This analysis continues to grow, but is not intended to be exhaustive, as there are many relevant initiatives happening in the UK and internationally, and within specific sectors. Please note that many of the initiatives referenced in this section also provide benchmarks for sectors not covered within REEB – these are not included in this report but may be of interest to readers with assets outside of office, retail, and industrial categories. We expect this analysis to continue to change over time and welcome any feedback from those producing or using industry benchmarks (info@betterbuildingspartnership.co.uk).

Please note

The methodologies used to produce industry benchmarks can vary significantly. Property benchmarks are typically quoted in kWh/m2/year, but even in these cases there can be significant differences in: Property Type Definition; Energy Data (Numerator); and Floor Area (Denominator). Benchmarks also vary in the averages used for any sample of assets (e.g. mean vs median) and the percentiles used to articulate various performance levels. Furthermore, some benchmarks are based on 'measured' data from a sample of assets, whilst others are 'constructed' from various sources which can include measured data, modelling, and other published information. The charts on the following pages have tried to make the distinctions between different benchmarks clear, whilst allowing for broad comparisons to be made.

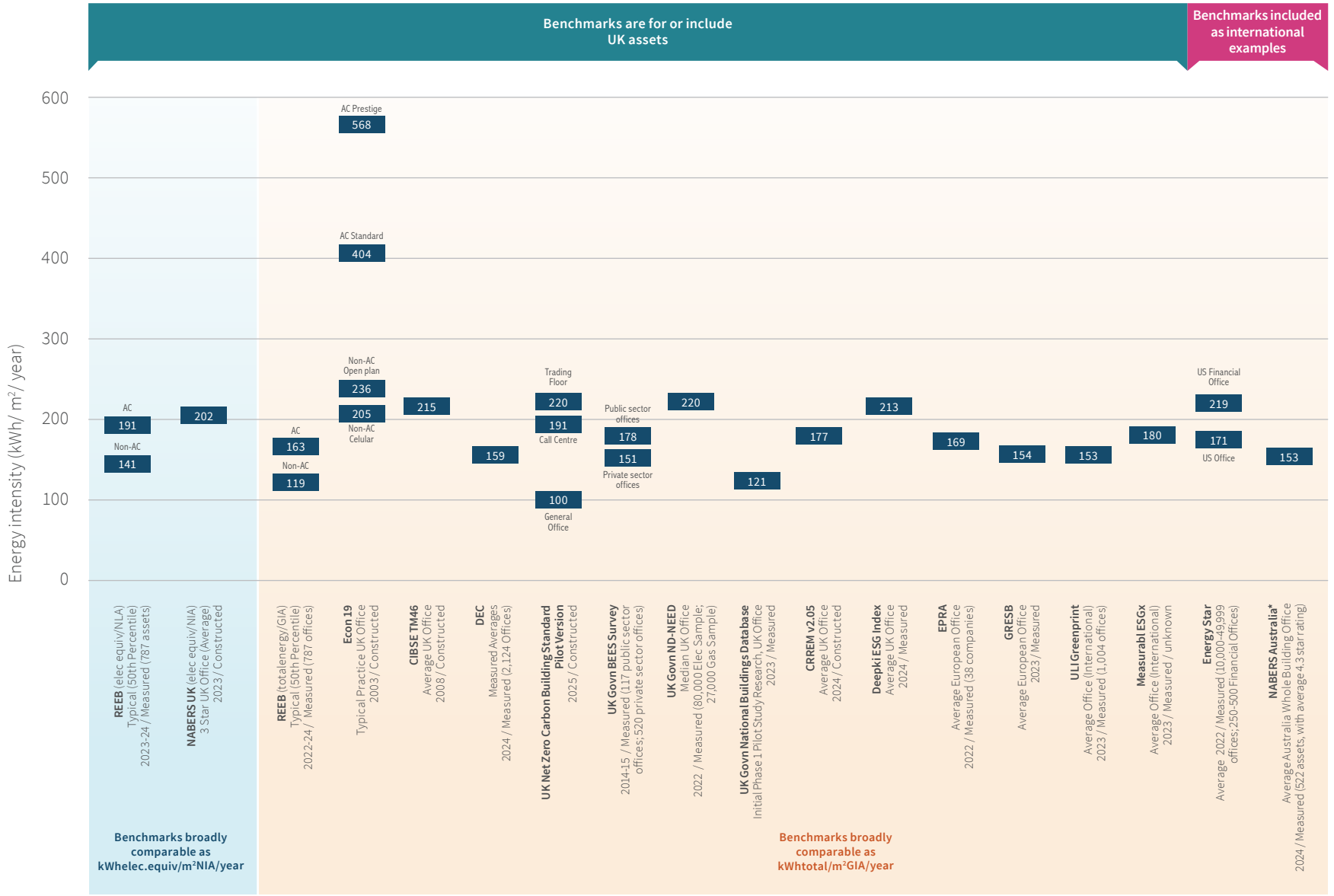
The analysis presented in this section is indicative-only. It can be used to understand the types of benchmarks available to the industry and a general range of performance levels. It should not be used as an alternative to engaging with the specific benchmarks directly to understand the performance level of an asset, and all benchmarks referred to are referenced on p.18 for further investigation.



Office Benchmarks in Context

This chart shows the REEB Office benchmarks in the context of a range of other office benchmarks available in the UK and internationally.

Please note that there is less variation in typology for office benchmarks than for retail and industrial benchmarks on the following pages.



* Please note that NABERS Australia had 2,228 rated office spaces in 2024 when considering Whole Building, Base Building and Tenancies combined, with an average energy intensity of 97 kWh/m²NLA/year. Whole Building ratings alone have been used for this chart, with an indicative conversion to GIA applied (see p.19 for references and notes)

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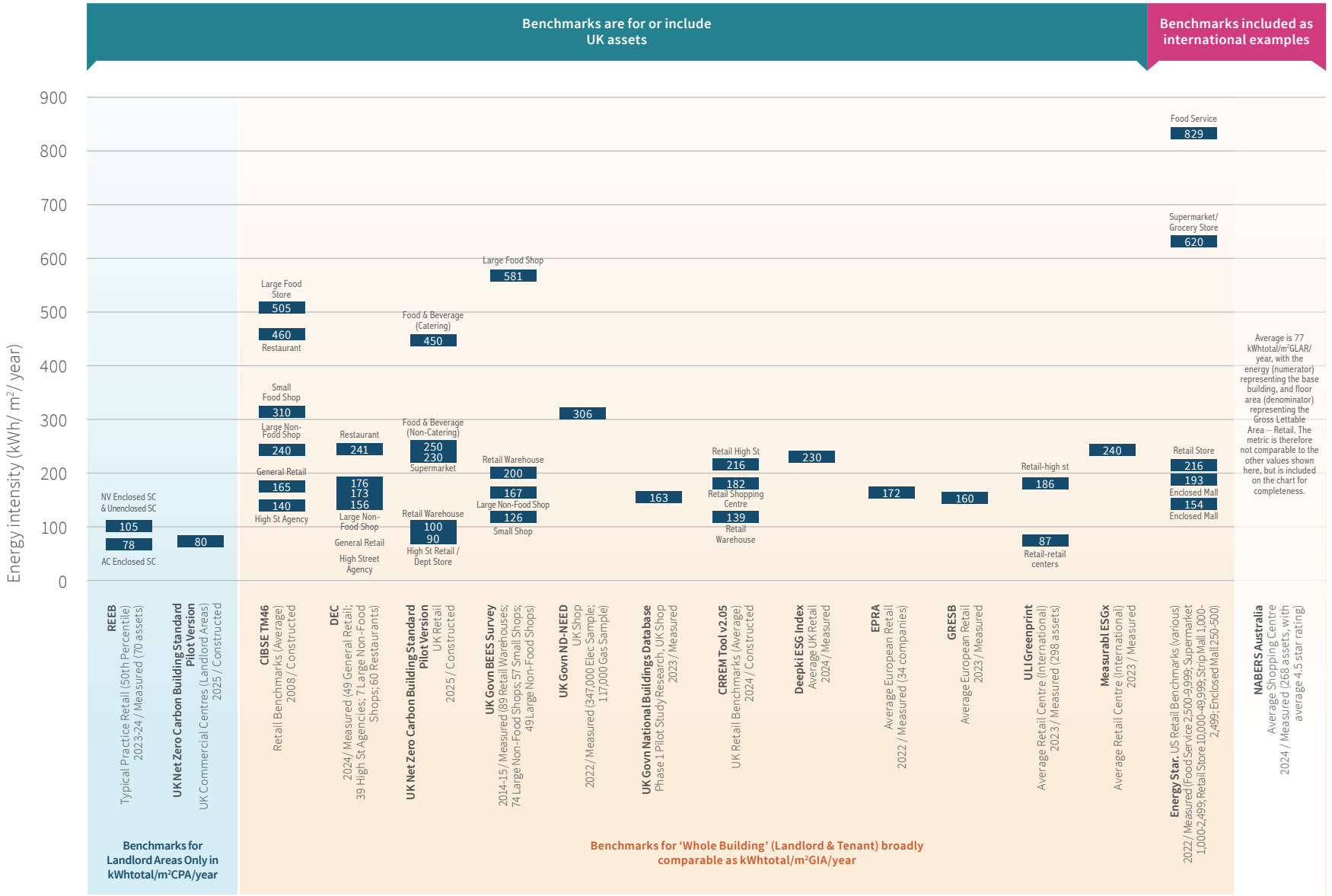
Retail Benchmarks in Context

This chart shows the REEB 'Retail' benchmarks in the context of a range of other retail benchmarks available in the UK and internationally.

Please note the lack of a standardised 'typology' for retail assets. Where organisations produce a variety of retail benchmarks there can be a significant variance between different retail 'types'.



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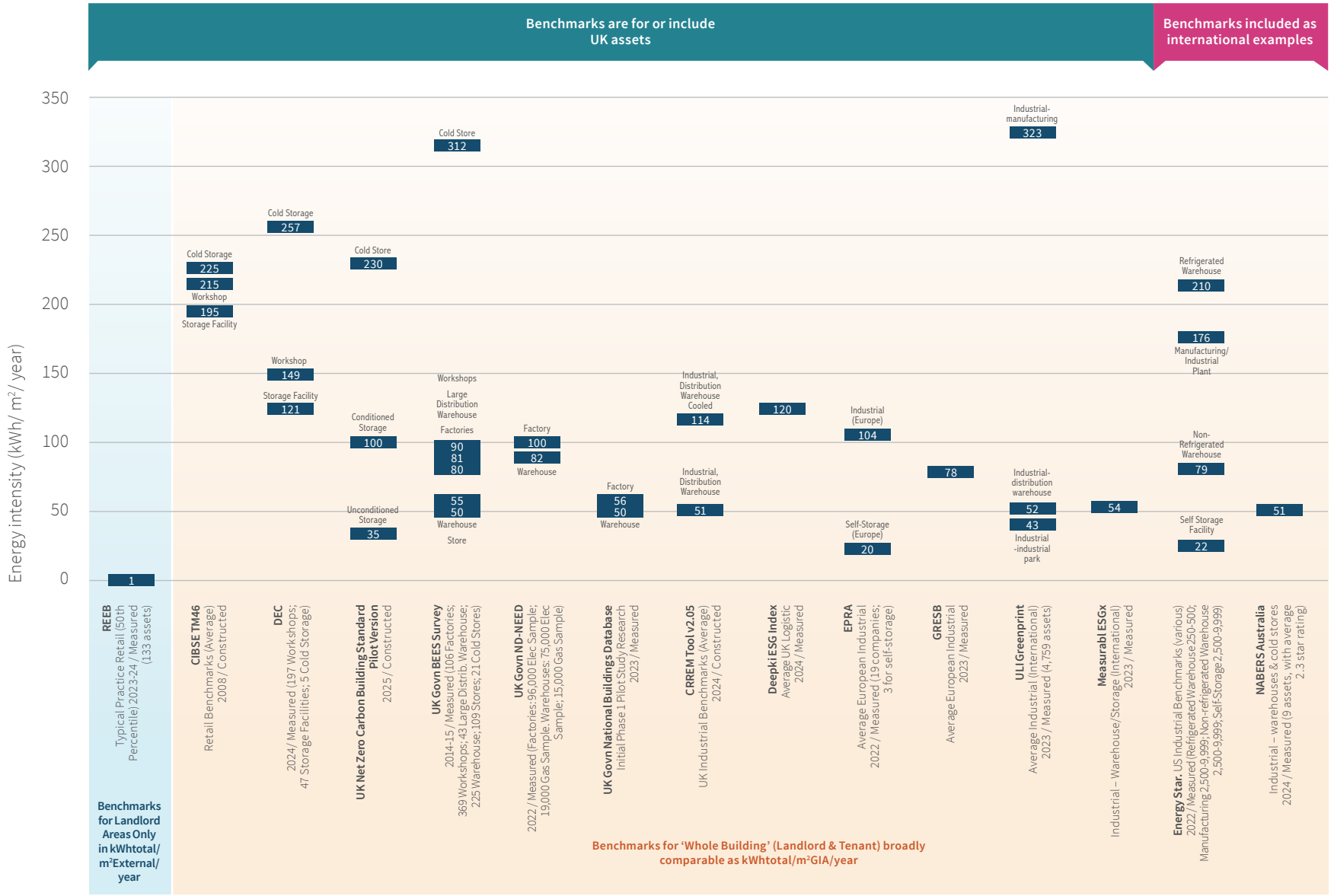
Industrial Benchmarks in Context

This chart shows the REEB 'Industrial' benchmarks in the context of a range of other industrial benchmarks available in the UK and internationally.

Please note the lack of a standardised 'typology' for industrial assets.



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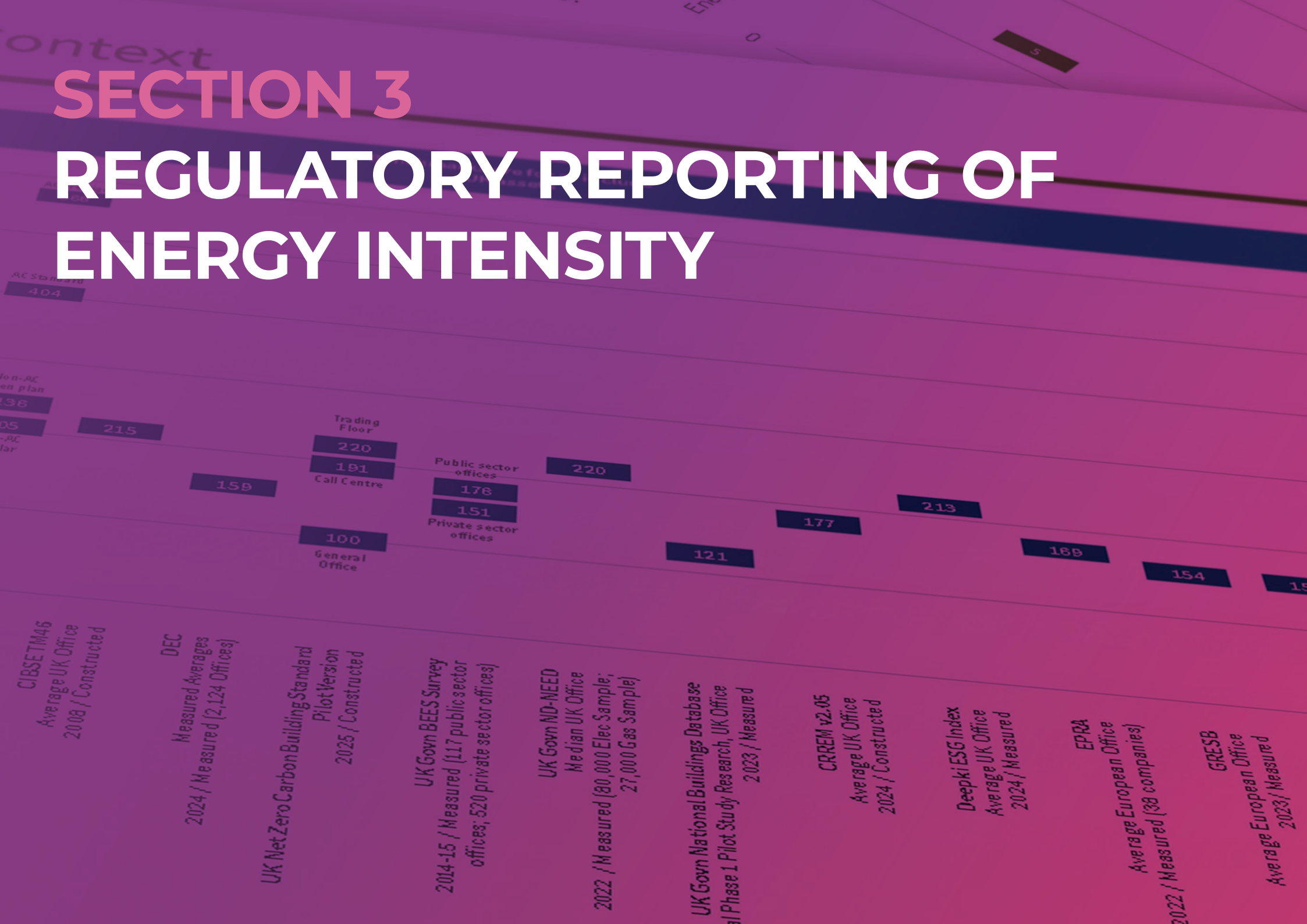
SECTION 3

REGULATORY REPORTING OF ENERGY INTENSITY



Regulatory Reporting of Energy Intensity

The BBP strongly supports all efforts to improve the availability of good energy intensity data for buildings, and recognises this as a fundamental precursor to improving building performance. Most of the initiatives referenced in section 2 of this report are voluntary, but trends towards mandatory reporting & disclosure of energy intensity are increasing, and over time we expect these to provide new sources of operational energy intensity data for the real estate sector.

The glossary table on the following page describes some these regulations, and how energy intensity metrics are included, either directly or indirectly. The table is split into three parts to distinguish between energy intensity reporting obligations aimed at companies, investors/lenders, and individual assets. As with section 2, this information is UK focused, but does reference international regulations where these have a significant impact on the UK. Whilst at present there is very little effective aggregation of this data for public use, we expect these regulatory sources of energy intensity data to become increasingly important to the energy benchmarking landscape in future.

We would emphasize the complexity around this topic at present, and several topics to consider that are outside of the scope of this summary are as follows:

- There are various local regulations within the UK that particularly affect asset-level reporting obligations. For example, local planning policies may mandate certifications such as BREEAM New Construction, or NABERS UK. These are not included in glossary table on the following page but will be very relevant to certain regions and projects.
- There are regulations that 'build upon' reporting obligations to drive improved performance. For example, the UK's Minimum Energy Efficiency Standards (MEES) regulations require a certain performance threshold for Energy Performance Certificates (EPCs). Some of these may be mentioned in the table on the next page, but they are generally out of scope.
- There may be relevant reporting obligations on other sectors that have indirect impacts on real estate reporting. One relevant example here is the utilities sector, which also holds data on building energy use. There have been calls for this data to become more 'open' to real estate owners and proptech companies, and any regulatory developments in this direction may create new public sources of energy use information that can be used to create intensity metrics.
- Many regulations in the glossary table make direct/indirect reference to voluntary industry standards and guidance and as such these will influence the reporting rules that organizations apply. Examples might include SBTi or CRREM for real estate explanations of 'climate transition risk'. General market practice dictates which of these are particularly important at a given time, and it does have relevance for how companies act to implement reporting obligations.

We intend to continue to develop this section as mandatory requirements/thresholds evolve, and welcome any feedback to info@betterbuildingspartnership.co.uk

Please note

The regulations referenced in this section contain significant amounts of detail. The glossary presented on the next page is a simple guide only, designed to help readers understand the emerging landscape in terms of energy intensity reporting. It should not be used for regulatory compliance purposes and readers should engage with the regulations directly to understand the reporting obligations.

Regulatory reporting glossary

	ORGANISATIONAL REPORTING Companies directly reporting on the environmental impacts of their business activity (e.g. via Annual Report & Accounts or another mechanism)							**ORG. REPORTING (INVESTOR/LENDER)** Investors/Lenders 'additionally' report on environmental impact of loans/ investments. This creates indirect requirements on companies seeking to attract finance from obligated organisations. Fund managers may also have to use these frameworks when advertising funds (groups of assets) for investment			**ASSET-LEVEL REPORTING** Regulatory reports/certificates directly attached to 'buildings' owned by a company/individual		
	UK-Direct (affects UK companies / dependent on size)					**EU** (May affect UK companies w EU subsidiary)	**Global** (influences UK regulatory position)	**UK-Direct** (affects UK investors / lenders)	**EU** (affects EU investors/lenders that UK companies may engage)		**UK-Direct**		**EU** (affects UK companies w EU assets)
Regulation	Section 172 Reports (2006)	Mandatory GHG Reporting (2013)	Energy Savings Opportunity Scheme (ESOS) (2015) EU EED*	Streamlined Energy & Carbon Reporting (SECR) (2019)	Climate-related Financial Disclosure Regulations (2022) TCFD*	Corporate Sustainability Reporting Directive (2024 / ongoing)	IFRS Sustainability Disclosures (UK strongly supports)	FCA Sustainability Disclosure Requirements (2024)	EU Taxonomy Regulation (2020)	Sustainable Finance Disclosure Regulation (SFDR) (2021)	Energy Performance Certificate (EPC) (2007) EU EPBD*	Display Energy Certificate (DEC) (2007) EU EPBD*	Recast EU Energy Performance Buildings Directive (2024)
General Summary	Requires companies to publicly report on impact of their activity on the environment	Requires companies to report publicly on their emissions	Requires companies to audit the energy performance of their organisation to find savings	Requires companies to report publicly on their energy use and efficiency, and any actions taken to reduce it	Requires companies to report publicly on 'climate risk'. Energy efficiency is a relevant part of this for real estate	Requires companies to report publicly on sustainability. Indicators defined by 10 'Standards'. 'E1 / Climate Change' relevant here	Initiative creating global framework for reporting on sustainability (linked to global accounting standards)	Governs labelling of investment products, and disclosure by investment firms, wrt a number of sustainability criteria	Governs labelling of investment products according to a number of sustainability criteria	Requires public reporting on sustainability indicators, using Principle Adverse Impact (PIA) indicators	Requires buildings to have a certificate showing their energy performance they can be sold/let	Requires public sector buildings to have an annual rating of their energy performance on display to public	EU directive establishing EPCs/DECs in various formats across EU. 2024 update incl. aims to standardise formats
Relevance of energy intensity metrics	Energy efficiency tends to be material to real estate disclosures relating to impact on the environment	Emissions must be reported, and stated in a ratio relating to business activity (e.g. CO2/m2 for real estate). Some ref to scope 3 req'd if using GHG Protocol as method	An ESOS report must itemise the impact of 'buildings', and include energy intensity ratios (in kWh/m2) for these	Energy use and emissions must be reported. The emissions must also be stated in a ratio relating to business activity (e.g. CO2/m2 for real estate)	Explanation of 'transition risk' requires reference to a decarbonization pathway. The most popular sources for real estate express this in kWh/m2, using 'Whole Building' data	Energy use must be reported, and expressed as a ratio with revenue. Reporting on climate risk would require energy intensity metrics (see adj column)	IFRS S2 focuses on climate risk. UK implementing via Climate-Related Financial Disclosure Regs (see adj column)	Reqs follow climate related financial disclosure regs (see adj column). Assets within product / seeking finance need to explain 'transition risk', likely using WB kWh/m2 indicator	For some categorisations, assets must be in the 'top 15%' of energy performers relative to national stock (requires a benchmark, likely WB & kWh/ m2)	Energy consumption intensity is one of the mandatory PIAs for SFDR (stated in ratio related to business activity). For real estate this is usually expressed as kWh/m2	Modelled energy efficiency (in kWh/m2/year) is used as part of the calculation that produces the EPC rating. MEES regulations^ require min. performance criteria	Actual energy efficiency (in kWh/m2/ year) used as part of the process to produce the rating.	Revisions mean EU EPCs will be standardised and incl. actual energy use (in kWh/m2). Rating linked to national stock data (best/ worst), and min. performance criteria incl.
Limitations (wrt provision of energy benchmark data)	Requirement broad / flexible so not specific enough for consistent public information	Energy data not required, and flex re intensity ratios & incl. tenant energy	The ESOS report is usually not made public, and tenant energy use is generally not included	Energy intensity ratio not a specific requirement, nor is tenant energy use or asset-level reporting	Transition risk not necessarily reported at 'asset level' (i.e. portfolio level reporting)	Transition risk not necessarily reported at 'asset level' (i.e. portfolio level reporting)	Transition risk not necessarily reported at 'asset level' (i.e. portfolio level reporting)	Asset level data not necessarily publicly disclosed	Criteria not clear for what 'top 15%' represents. Asset level data not necessarily publicly disclosed	Reporting required by sector (i.e. not necessarily by asset)	Rating data is publicly available at asset level, but not modelled kWh/m2. Not necessarily WB.	Rating and energy use data is publicly available at asset level. Public sector mostly, not always WB	Implementation ongoing. Significant potential for public benchmark data as must be made available

*UK Regulations derived from EU Directives, or global initiatives. In these cases the EU Energy Efficiency Directive (EU EED), the Taskforce on Climate Related Financial Disclosures (TCFD), and the EU Energy Performance of Buildings Directive (EU EPBD).

^Minimum Energy Efficiency Standards (MEES) regulations in the UK use EPCs as the basis on which to set energy performance standards that buildings must achieve to be sold/let

References & Useful Links

All links provided correct at time of publication.

References & Detail of Sources Used for 'REEB In Context' Charts (Section 2)

NABERS UK
Reference data taken from 'NABERS UK Reverse and Simple Calculator Tool' (NABERS_UK_Reverse_and_Simple_Calculators_v2.0.xls)
Website reference for tool download: https://www.cibsecertification.co.uk/nabers-uk/products/useful-downloads

Please note that the 'Whole Building Reverse Calculator' tab was used to determine the '3 Star' EUI threshold used in this report. The following parameters were used: 2021 (Data Year); Central London (Postcode); 40 hours per week (Operating hours at >20% occupancy); 1 occupied workstation per 20m2 (Occupant Density); 75%-25% ratio of electricity-gas (Fuel Mix)

CIBSE TM46
Reference data taken from TM46 document directly.
Document reference: CIBSE. *TM46: Energy Benchmarks*. CIBSE, 2008.
Report available at: https://www.cibse.org/knowledge-research/knowledge-portal/tm46-energy-benchmarks

DISPAY ENERGY CERTIFICATES (DEC) MEASURED AVERAGES
Reference data taken from Department for Levelling Up, Housing & Communities dedicated website for accessing EPC and DEC data
Website reference: https://epc.opendatacommunities.org/login

Please note that the relevant data provided in this report was produced by taking a bulk download of 2024 Display Energy Certificates (37,685 total records), which were then filtered to remove those with on-site renewables, and organised by 'Main Benchmark Type'. The 'Annual Thermal Fuel Use' and 'Annual Electrical Fuel Use' (both already expressed in kWh/m2/year) were added together and the median value taken for the relevant typological samples.

ECON 19
Reference data taken from Econ 19 directly.
Document reference: UK Government Energy Efficiency Best Practice Programme. *Energy Consumption Guide 19: Energy Use in Offices. Carbon Trust*, 2003.

UK Net Zero Carbon Building Standard
Reference data taken from pilot version of the Net Zero Carbon Building Standard released in 2024
Document reference: UK Net Zero Carbon Building Standard. Pilot Version rev1. 2024
Report available at: https://www.nzcbuildings.co.uk/pilotversion

UK Government BEES Survey
Reference data taken from sector reports and associated tables available at https://www.gov.uk/government/publications/building-energy-efficiency-survey-bees
Document references: Department for Business, Energy & Industrial Strategy. *Building Energy Efficiency Survey 2014-15: Overarching Report*. 2016; Department for Business, Energy & Industrial Strategy. *Building Energy Efficiency Survey: Office Sector, 2014-15*. 2016; Department for Business, Energy & Industrial Strategy. *Building Energy Efficiency Survey: Retail Sector, 2014-15*. 2016; Department for Business, Energy & Industrial Strategy. *Building Energy Efficiency Survey: Industrial Sector, 2014-15*. 2016; Department for Business, Energy & Industrial Strategy. *Building Energy Efficiency Survey: Storage Sector, 2014-15*. 2016

UK Government Non-Domestic National Energy Efficiency Data Framework (ND-NEED)
Reference data taken from 2024 report and associated data table available at https://www.gov.uk/government/collections/non-domestic-national-energy-efficiency-data-framework-nd-need
Document reference: Department for Energy Security and Net Zero. *The Non-Domestic National Energy Efficiency Data-Framework 2024 (England and Wales)*. 2024

Please note that the ND-NEED intensity values are presented in separate tables for 'median electrical intensity' and 'median gas intensity'. The values have been added together for presentation in the 'REEB In Context' charts, in order to best represent 'total energy intensity'. This may not be appropriate to the sampling methods used in the ND-NEED approach (e.g. where the electrical intensity medians include 'all electric' buildings in the sample), but is used here to provide an indicative comparison with the other initiatives.

UK Government National Buildings Database Phase 1 Research
Reference data taken from the reports available at https://www.gov.uk/government/publications/national-buildings-database-phase-1-non-domestic-building-stock-in-england-and-wales
Document reference: Department for Energy Security and Net Zero. *Non-Domestic Building Stock in England and Wales Part 2: Energy Consumption.* DESNZ research paper series number: 2024/005. 2023

CRREM
Reference data taken from CRREM Tool v2.05
Website reference for tool download: https://www.crrem.eu/tool

Deepki ESG Index
Reference data taken from Deepki ESG Index website directly.
Website reference: https://index-esg.com (accessed February 2025)

Please note that the following filters were used to generate the data used in this report: UK (Region); 2023 (Publication Year); Final Energy Consumption (Indicator)

EPRA
Reference data taken from KPMG & EPRA study on the non-financial performance of LRE companies in Europe.
Document reference: European Public Real Estate Association. *Deep Dive on Non-Financial Performance: Listed Real Estate Companies Across Europe*. 2023.
Report available at: https://www.epra.com/press-corner/articles/kpmg-epra-study-non-financial-performance-listed-real-estate-companies-europe-focusing-energy-intensity-water-intensity-and-gree

GRESB
Reference data taken from GRESB website directly, using the summary results for the 2024 Real Estate Assessment
Website reference: https://public.tableau.com/app/profile/gresb.engineering/viz/2024RealEstateGlobalResults/RE-AssetAverageIntensity (accessed April 2025)

Please note that the data in this report was taken from the 'Real Estate Asset Average Intensity Chart'. Filters applied as follows: Energy/Office/Europe; Energy/Retail/Europe; Energy/Industrial/Europe.

ULI Greenprint
Reference data taken from ULI annual 'State of Green' Report.
Document reference: Urban Land Institute. *State of Green: ULI Greenprint Performance Report*, Vol. 15. Washington, D.C.: Urban Land Institute, 2024.
Report available at: https://knowledge.uli.org/en/reports/research-reports/2024/state-of-green-greenprint-performance-report-volume-15

Measurabl ESG Exchange (ESGx)
Reference data taken from Mearuabl website directly.
Website reference: https://www.measurabl.com/esgx-benchmarks

Please note that the data in this report has been converted from kWh/ft2 to kWh/m2 using a factor of x10.76

NABERS Australia
Reference data taken from the online NABERS Annual Report
Website reference: https://nabers.info/annual-report/2023-2024 (accessed February 2025)

Please note that the following filters were used to generate the data used in this report: All (State); Whole Building (Rating Scope)

Please note that the NABERS Annual Report data was converted from MJ/m2 to kWh/m2 using a factor of x0.28. For offices, the energy intensity values have also been converted from NLA to GIA (denominator) using an indicative factor of x1.25

Energy Star
Reference data taken from Energy Star website directly, using the 'Data Explorer' Tool
Website reference: https://www.energystar.gov/buildings/resources-topic/portfolio-manager-data-explorer

Please note that the following 'Data Explorer' Tool filters were used to generate the data used in this report: 2022 (Data Year); All (Property Types); All (Gross Floor Area); All (States); All (Energy Star Certified); All (Years Built); All (Weekly Operating Hours)

Please note that the 'Data Explorer' Tool data was converted from kBtu/sq.ft to kWh/m2 using a conversion factor of x3.15

Useful Links related to the Regulatory Glossary Table (Section 3)

Section 172 reports: https://www.icaew.com/technical/corporate-reporting/section-172-1-statement

Mandatory GHG Reporting & Streamlined Energy & Carbon Reporting Regulations (SECR): https://www.gov.uk/government/publications/environmental-reporting-guidelines-including-mandatory-greenhouse-gas-emissions-reporting-guidance

Energy Savings Opportunity Scheme (ESOS): https://www.gov.uk/government/publications/comply-with-the-energy-savings-opportunity-scheme-esos/complying-with-the-energy-savings-opportunity-scheme-esos#steps-for-carrying-out-an-esos-assessment

Climate Related Financial Disclosure Regulations: Climate-related financial disclosures for companies and limited liability partnerships (LLPs) - GOV.UK

Corporate Sustainability Reporting Directive (CSRD): ESRS workstreams | EFRAG

IFRS Sustainability Disclosures: IFRS - Introduction to the ISSB and IFRS Sustainability Disclosure Standards

Sustainability Disclosure Requirements (SDR): Sustainability disclosure and labelling regime | FCA

EU Taxonomy: https://finance.ec.europa.eu/sustainable-finance/tools-and-standards/eu-taxonomy-sustainable-activities_en

SFDR: https://finance.ec.europa.eu/sustainable-finance/disclosures/sustainability-related-disclosure-financial-services-sector_en

Energy Performance Certificates (EPC): https://www.gov.uk/government/publications/energy-performance-certificates-for-the-construction-sale-and-let-of-non-dwellings--2

Minimum Energy Efficiency Standards (MEES): https://www.gov.uk/guidance/non-domestic-private-rented-property-minimum-energy-efficiency-standard-landlord-guidance

Display Energy Certificates (DEC): https://www.gov.uk/government/publications/display-energy-certificates-and-advisory-reports-for-public-buildings/a-guide-to-display-energy-certificates-and-advisory-reports-for-public-buildings

Recast EU Energy Performance of Buildings Directive (EPBD): https://ec.europa.eu/commission/presscorner/detail/en/qanda_24_1966

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CLS Holdings plc
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COLUMBIA THREADNEEDLE INVESTMENTS
CUSHMAN & WAKEFIELD
DERWENT LONDON
DWS
Federated Hermes
FIERA REAL ESTATE
FRASERS PROPERTY
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