# UK Net Zero Carbon Buildings Standard

Version 1, Rev 1

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# Introduction

The UK Net Zero Carbon Buildings Standard ('the Standard') has been collaboratively developed by a wide range of stakeholders in the United Kingdom's built environment industry. It creates a unified definition for 'Net Zero Carbon Aligned Buildings' in the UK, underpinned by an evidence-based reporting methodology for new as well as existing building projects (both with and without retrofit works taking place). The Standard is for everyone connected with the UK's real estate industry. Its development has been led by a coalition of Professional Institutions, industry bodies and leaders in the field who recognise the need for consistent rules, both to increase credibility of claims around net zero carbon, and to accelerate the design, construction and use of buildings that deliver lower-carbon outcomes in line with the UK's legally binding carbon budgets and targets.

Climate science (https://www.ipcc.ch/sr15/) shows that, to prevent the worst impacts of climate change on people and natural ecosystems, the planet's average temperature rise needs to be limited to 1.5°C above pre-industrial levels. To do this, humanity must reduce worldwide carbon emissions in line with the global 'carbon budget' pathway and reach a net zero carbon world by 2050. Reaching worldwide net zero carbon means realising a global balance between the greenhouse gases emitted by humans into the atmosphere and those removed from it. In line with this overarching aim, all sectors in all countries must significantly reduce their emissions and counterbalance any remaining emissions.

The scope and applicability of this Standard is the design, construction and use of buildings in the UK, although its principles and approach could be adapted and applied to other nations and regions, or other UK sectors.

The Standard sets out requirements for net zero carbon aligned buildings that could – if the rest of the UK building stock were to collectively implement compatible interventions – enable the UK built environment sector to not exceed its share of our national carbon and energy budgets. This approach is defined by the term 'Net Zero Carbon Aligned Building' within the Standard.

Offsets may be used to complement, but not replace, the core elements of the Standard, and may be used to achieve net zero carbon at the asset level. This approach is defined by the term 'Net Zero Carbon Aligned Building (plus offsets)' within the Standard.

To minimise duplication of effort, the Standard recognises other schemes and Standards and through collaborative agreements, and allows for these to be used to satisfy one or more of the Standard's mandatory requirements. Furthermore, in recognition of the market need for assurance at Practical Completion, the Standard provides the option for a verified 'on track' status claim which claimants may use to indicate that what has been built should be capable of meeting the Standard in the future. Finally, to address the fact that whole building verification may not always be possible, the Standard allows landlords and tenants to separately claim conformity for their building part.

The requirements within the Standard cover a range of topics such as upfront carbon, operational energy use, avoidance of fossil fuel use on site, renewables and refrigerants. Limits have been derived from measured performance data, combined with expert professional experience on future performance trends and buildability, which have been compared against a model of the entire existing stock and future UK build-out rates.

The purpose of modelling and the associated development of the limits has been threefold: 1) to identify a deliverable route to net zero carbon for the UK built environment as a whole; 2) to discern the wider systemic actions required to enable the UK real estate sector to conform to the necessary net zero carbon pathway; 3) to ensure that any building claiming to be 'Net Zero Carbon Aligned' is achieving energy and emissions performance sufficient to keep the cumulative totals as faithfully as possible within the UK's remaining carbon and energy budgets. The limits represent ambitious but achievable requirements for building performance and construction quality.

The Standard has sections and annexes as summarised below:

| Sections | Contents and purpose |
|---|---|
| Sections 1 to 3 | Scope, references, terms and definitions, and abbreviations used by the Standard. |
| Section 4. General principles | Overarching requirements of the Standard that apply across all assessments, submissions and verifications. |
| Section 5. Assessment, submissions and limits | Requirements specific to each aspect of the Standard, such as embodied carbon or operational energy. |
| Section 6. Verification | How claimants engage with the verifier and verification process. Lists competency requirements to become a verifier for the Standard. |
| Section 7. Communication | How conformity claims to the Standard may be communicated, and when such claims are permissible. |
| Annex A Limits and targets | Numerical requirements of the Standard, varying by type of building, construction works, timing and sector. |
| Annex B Submission proforma | Links to standalone spreadsheets for submitting numerical evidence of conformity with the Standard for verification. |
| Annex C Other schemes and standards deemed to satisfy one or more requirements of the Standard | The use of other schemes and standards that are deemed to satisfy some of the requirements of the Standard, to prevent double-working. |

| Sections | Contents and purpose |
|---|---|
| Annex D Roles and responsibilities (for information) | An informative annex explaining the likely roles and responsibilities required for implementation of the Standard on a building. |
| Annex E PC-on-track verified checks | Optional, verifiable checks to undertake at the time of practical completion, to demonstrate that what has been built should be able to meet the Standard once the building is occupied. |
| Annex F Landlord and tenant routes | Rules on applying the Standard when a whole building assessment and verification is not possible, with separate routes for landlords and tenants. |
| Contributors (for information) | Lists all contributors involved in the development of the Standard. |

It is the intention that the Standard will continue to evolve over time. Although not included in the current version of the Standard due to insufficient availability of robust data, the Standard aims to evolve to include the following aspects:

- Life cycle embodied carbon limits;
- Whole life carbon limits;
- Space heating and/or cooling limits across further sectors and building types;
- Electricity demand management limits;
- New limits for areas or uses that are currently classified as Additional Uses.

It is also assumed that the operational energy limits may evolve further, to reflect occupancy density and utilisation intensity. It goes without saying that the Standard will also evolve to reflect future information from external organisations such as the Climate Change Committee (CCC) and National Energy System Operator (NESO), as it evolves overtime. As future versions will consider the latest published carbon and energy budgets, the Standard's limits and targets may be adjusted to maintain the decarbonisation trajectory towards the UK's carbon budgets and targets – though this will not affect buildings that have already achieved verification.

The Standard builds on previous work in the net zero carbon field by BBP, BRE, CIBSE, IStructE, LETI, RIBA, RICS and the UKGBC, and the methodology for carbon accounting adopted in the Standard is in line with the current edition of the RICS *Professional Standard – Whole Life Carbon Assessment for the Built Environment*, which is referenced throughout.

The development of the technical content, text and the numerical limits in the Standard has been led by the Technical Steering group with representatives from BBP, BRE, CIBSE, IStructE, LETI, RIBA, RICS and UKGBC, with early support from the Carbon Trust, and ongoing support from industry volunteers. Hundreds of volunteers helped shape the Standard. Since publication of the Pilot Version of The Standard, 205 projects and 134 property owners participated in a UK wide Pilot Testing Programme giving detailed and specific feedback on applying the Standard to live projects, producing more than 17,000 data points and nearly 3,000 open text responses.

Coupled with reflections from focussed workshops, an open survey and specialist working groups (e.g. feeding back on heritage buildings, data centres, or landlord- and tenant-only approaches), industry feedback and interaction has been extensive. This body of comments, evidence and views has been used to inform the updates needed to produce Version 1 of the Standard.

We are incredibly grateful to all those who have volunteered time, to the organisations who enabled and financially supported the Standard, and to those who have committed to continue to support the Standard going forward.

Version 1 is published alongside a suite of supplementary documents, including mandatory reporting proformas, and guidance for heritage buildings considering the Standard. These, and a range of explanatory reports (such as how the limits were set), can be downloaded from the UK Net Zero Carbon Buildings Standard website at www.nzcbuildings.co.uk.

While the Standard is applicable to all building types, in some cases heritage buildings may require tailored approaches to place them on an appropriate net zero carbon trajectory as part of alignment with the Standard. While the Standard Version 1 does not currently provide a bespoke approach for such cases, the heritage project decarbonisation journey flowcharts published alongside the Standard set out an initial framework, and subsequent guidance will be published on the UK Net Zero Carbon Buildings Standard website as it becomes available.

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# 1. Scope

The UK Net Zero Carbon Buildings Standard ("the Standard") is applicable to building-related construction works and the use of buildings in the United Kingdom, that can be classified according to one or more of the following sectors:

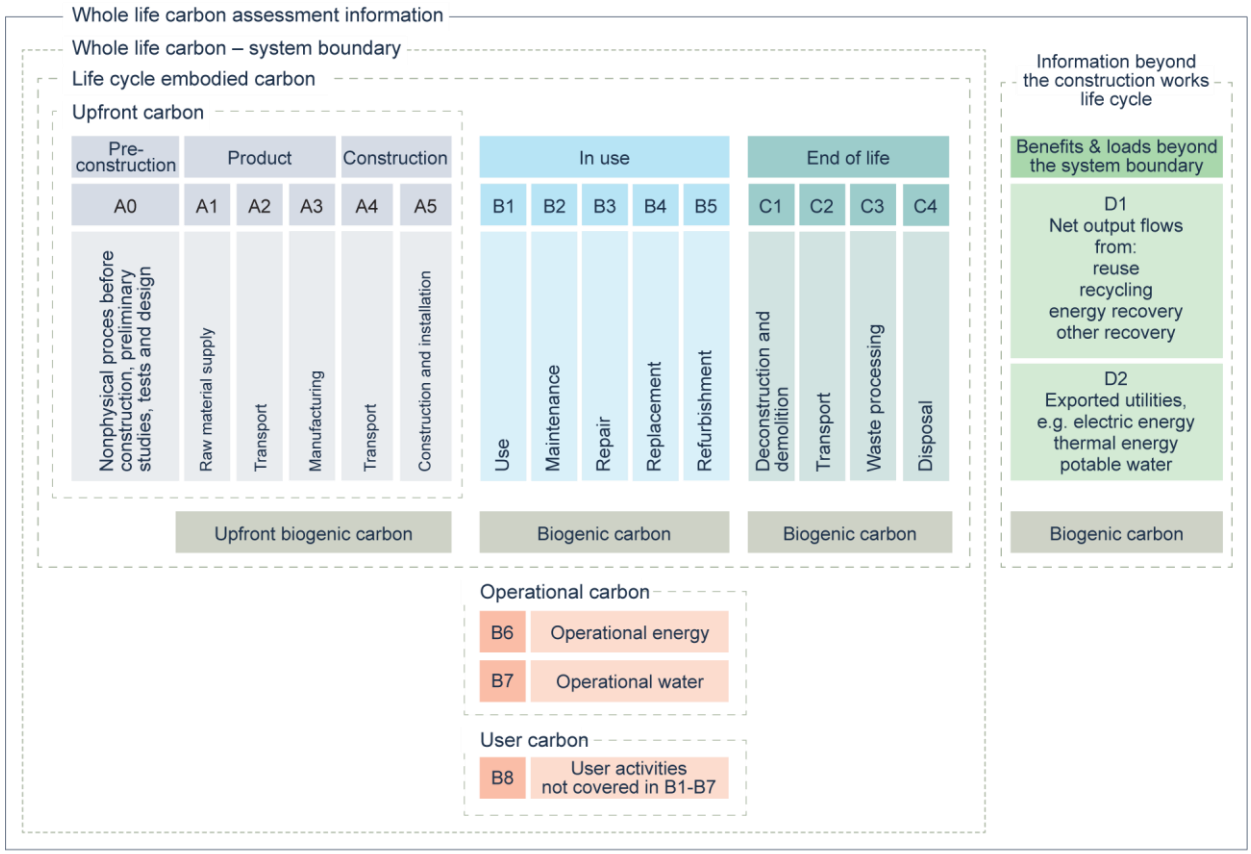
- Commercial Residential;
- Culture and Entertainment;
- Data Centres;
- Healthcare;
- Higher Education;
- Homes;
- Hotels;
- Offices;
- Retail;
- Schools;
- Science and Technology;
- Sport and Leisure;
- Storage and Distribution.

Due to the availability of data used to develop the limits, targets and other factors, this Standard is not applicable for:

- Buildings located outside the United Kingdom;
- Assets other than buildings;
- Buildings that cannot be classified into the relevant sectors.

The Standard covers the whole life cycle of a building, as set out in Figure 1.

The limits and targets set by this Standard are only applicable to completed works and fully operational buildings (see section 4.2.1), thus no claim of conformity or alignment with this Standard can be made during the design and construction phases of a project. Annex E offers a methodology for completing performance checks at Practical Completion, though this does not constitute conformity.




Building and infrastructure lifecycle stages and information modules (adapted from EN 15978, EN 17472 and EN 15643, with additions to illustrate biogenic carbon)

*Figure 1 The life cycle stages as per RICS Professional Standard - Whole Life Carbon Assessment for the Built Environment 2nd edition (in turn, adapted from EN 15978, EN 17472 and EN 15643, with additions to illustrate biogenic carbon)*

# 2. Normative references

A normative reference is a document that contains information that is necessary to understand and use, in order to implement a standard. Normative references are essential for applying a standard and cannot be ignored if the standard is to be used properly. This Standard depends upon the following.

Where the text given below in *blue italics* is used in the rest of the Standard, it **shall** refer to the reference listed here. Where a specific version/year is cited, that version **shall** be used (e.g., a specific date of publication or edition reference). For unspecified references, the latest edition of the document applies, including any amendments.

*CIBSE CP1* Code of Practice 1 Heat networks: Code of Practice for the UK
https://www.cibse.org/knowledge-research/knowledge-portal/cp1-heat-networks-code-of-practice-for-the-uk-2020-pdf/

*CIBSE TM65* Embodied carbon of building services: a calculation methodology, Chartered Institution of Building Services Engineers
https://www.cibse.org/knowledge-research/knowledge-portal/embodied-carbon-in-building-services-a-calculation-methodology-tm65

*DUKES* Digest of UK Energy Statistics for the latest year
https://www.gov.uk/government/collections/digest-of-uk-energy-statistics-dukes

*IStructE How to Calculate Embodied Carbon*, The Institution of Structural Engineers
https://www.istructe.org/resources/guidance/how-to-calculate-embodied-carbon/

*CWCT Methodology*, How to calculate the embodied carbon of facades: a methodology, Centre for Window and Cladding Technology
https://www.cwct.co.uk/pages/embodied-carbon-methodology-for-facades

*GHG Protocol*
https://ghgprotocol.org/

*NABERS UK*, Energy for Offices Version 2.1
https://www.cibsecertification.co.uk/nabers-uk/

*NHS NZBS*, NHS Net Zero Building Standard
https://www.england.nhs.uk/estates/nhs-net-zero-building-standard/

*RICS Code of Measuring Practice*, Royal Institution of Chartered Surveyors
https://www.rics.org/profession-standards/rics-standards-and-guidance/sector-standards/real-estate-standards/code-of-measuring-practice

*RICS PS*, RICS Professional Standard: Whole Life Carbon Assessment for the Built Environment, Royal Institution of Chartered Surveyors

https://www.rics.org/profession-standards/rics-standards-and-guidance/sector-standards/construction-standards/whole-life-carbon-assessment

*RICS PS Supporting Document*, RICS Professional Standard Supporting Document: Building element categories spreadsheet, Royal Institution of Chartered Surveyors https://www.rics.org/content/dam/ricsglobal/documents/standards/Reporting-template-buildings.xlsx

*Passivhaus*, Passivhaus Trust Certification https://www.passivhaustrust.org.uk/certification.php

*UKGBC Renewable Energy Procurement Guidance* https://ukgbc.org/our-work/topics/advancing-net-zero/renewable-energy-procurement/

*UK Energy from Waste Statistics*, published by Tolvik Consulting https://www.tolvik.com/published-reports/

*UK Government Conversion Factors Full Set*, UK Government Conversion Factors for Company Reporting of Greenhouse Gas Emissions, full set (for advanced users) https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting

*BS EN 1990*:2023 Eurocode. Basis of structural and geotechnical design

*BS EN 1998*:2004+A1:2013 Eurocode 8: Design of structures for earthquake resistance General rules, seismic actions and rules for buildings.

*EN 15643*:2021 Sustainability of construction works. Framework for assessment of buildings and civil engineering works

*EN 15804*:2012+A2:2019 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products

*EN 15941*:2024 Sustainability of construction works – Data quality for environmental assessment of products and construction work - Selection and use of data

*EN 15978*:2011 Sustainability of construction works – Assessment of environmental performance of buildings – Calculation method

*EN 17472*:2022 The Standard for Sustainability of construction works. Sustainability assessment of civil engineering works. Calculation methods

*EN 50693*:2019 Product category rules for life cycle assessments of electronic and electrical products and systems

*EN IEC 63366*:2025 The Standard for Product category rules for life cycle assessment of electrical and electronic products and systems

*ISO 14025*:2006. Environmental labels and declarations — Type III environmental declarations — Principles and procedures

*ISO 14040*:2006 Environmental management – Life cycle assessment – Principles and framework

*ISO 14044*:2006 Environmental management – Life cycle assessment – Requirements and guidelines

*ISO 14064-3*:2019 Greenhouse gases - Specification with guidance for the verification and validation of greenhouse gas statements

*ISO 14065*:2021 General principles and requirements for bodies validating and verifying environmental information

*ISO 14067*:2018 Greenhouse gases. Carbon footprint of products. Requirements and guidelines for quantification

*ISO 21930*:2017. Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of construction products and services

*ISO/IEC 17029*:2019 Conformity Assessment. General principles and requirements for validation and verification bodies

PAS 2035/2030:2019+A1:2022 Retrofitting dwellings for improved energy efficiency. Specification and guidance

*PAS 2038*:2021 Retrofitting non-domestic buildings for improved energy efficiency. Specification

*PAS 2050*:2011 Specification for the assessment of the life cycle greenhouse gas emissions of goods and services

# 3. Terms, definitions and abbreviations

## 3.1 Terms and definitions

The following terms and definitions **shall** apply.

### 3.1.1 Whole life carbon terms

#### 3.1.1.1 Whole life carbon

Total greenhouse gas emissions and removals, both operational and embodied, over the whole life cycle of a building, including its disposal (life cycle modules: A0–A5, B1–B7, B8 (optional) and C1–C4, with life cycle module A0 assumed to be zero for buildings).

Whole life carbon includes both removals and emissions of biogenic carbon.

*NOTE The life cycle modules and stages are as set out in EN 15643 and the RICS PS and are shown in Figure 1.*

#### 3.1.1.2 Greenhouse gas

Constituents of the atmosphere, both natural and anthropogenic (human-created), that absorb and emit radiation at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's surface, the atmosphere and clouds.

#### 3.1.1.3 Greenhouse gas removal

Withdrawal of a greenhouse gas from the atmosphere.

#### 3.1.1.4 Global warming potential

A measure of how much energy (e.g., heat) the emissions of 1 tonne of a gas will absorb over a given period of time, relative to the emissions of 1 tonne of carbon dioxide ($CO_2$).

#### 3.1.1.5 Biogenic carbon

Greenhouse gas removals associated with carbon sequestration into biomass, as well as any emissions associated with this sequestered carbon.

*NOTE Greenhouse gas removals and emissions for timber can only be accounted for as biogenic carbon if the timber is sustainably sourced (e.g., FSC, PEFC or GiB certified). No removals, but all emissions from any unsustainably sourced timber must be accounted for as GWP LULUC and included in the reported upfront and life cycle embodied carbon.*

#### 3.1.1.6 Life cycle embodied carbon

Total greenhouse gas emissions and removals, associated with construction products and construction processes, over the whole life cycle of a building, including its disposal (life cycle modules: A0–A5, B1–B5 and C1–C4, with life cycle module A0 assumed to be zero for buildings).

*NOTE Where the term 'embodied carbon' is used without the preceding words 'life cycle' in this Standard, it is being used as a more general term.*

#### 3.1.1.7 Upfront carbon

Greenhouse gas emissions, associated with construction products and construction processes, up to practical completion (life cycle modules: A0–A5, with life cycle module A0 assumed to be zero for buildings).

Upfront carbon excludes biogenic carbon sequestered in the installed products at practical completion.

*NOTE As the benefit of the carbon removal associated with any biobased content of products used in the building is not included in upfront carbon, upfront carbon can be calculated by adding the GWP fossil and GWP LULUC indicators for modules A0-A5, or deducting, as $CO_2$, the sequestered carbon within the products as installed in A1-A3, from the GWP Total for A0-A5.*

#### 3.1.1.8 Operational carbon

Greenhouse gas emissions (direct and indirect) associated with energy used by a building in use over its life cycle (life cycle module B6), or with the supply and wastewater treatment of water, used by a building in use over its life cycle (life cycle module: B7).

#### 3.1.1.9 Operational energy

Energy used by a building in use over its life cycle from all supplies, including renewable electricity or heat generated on site (life cycle module: B6).

#### 3.1.1.10 Life cycle assessment

Compilation and evaluation of the inputs, outputs and the potential environmental impacts of a product system throughout its life cycle. Also known as whole life cycle assessment.

#### 3.1.1.11 Carbon offsetting

Payment to receive credit for a certified unit of carbon emission reduction or removal carried out by another actor. Varying levels of accreditation exist for carbon offsets.

#### 3.1.1.12 Carbon insetting

As carbon offsetting, except the reduction or removal of carbon emissions occurs only within a company's own value chain.

#### 3.1.1.13 Renewable energy guarantees of origin

UK government-backed scheme (via Ofgem) providing transparency about the proportion of electricity that suppliers source from renewable electricity. See also https://www.ofgem.gov.uk/environmental-and-social-schemes/renewable-energy-guarantees-origin-rego

### 3.1.2 Metrics, units, and requirements terms

#### 3.1.2.1 Metric

A defined measurement method and measurement scale.

#### 3.1.2.2 Pass/fail metric

A metric that is mandatory to assess and report in the submission, and may have an associated mandatory numerical limit(s) or target(s).

Where a numerical limit is provided, this **shall not** be exceeded (e.g., “less than 10”).

Where a numerical target is provided, this **shall** be met or exceeded (e.g. “at least 10”).

*NOTE 1 Where no limit/target is provided, the pass/fail metric will still need to be reported.*

*EXAMPLE Upfront carbon per $m^2$ GIA for a new office building*

#### 3.1.2.3 Reporting metric

A metric that is mandatory to assess and report in the submission, but has no associated limit or target.

*EXAMPLE Annual operational water use*

*NOTE 2 Whilst these metrics do relate to significant sources of carbon emissions, due to limitations in the currently available data or methodologies, it is not yet possible to set robust limits or targets. In future versions of the Standard, some reporting metrics could be changed to pass/fail metrics, once enough data exists to set limits or targets for these. Users of the Standard are encouraged to consider all the metrics together, when identifying ways to minimise overall carbon emissions*

#### 3.1.2.4 Optional reporting metric

A metric that is optional to assess and has no associated limit or target.

*EXAMPLE Upfront carbon per pupil for a new educational building*

#### 3.1.2.5 Pass/fail requirement

A defined aspect of performance of a building that is mandatory to assess and has an associated mandatory requirement that is not numerical.

*EXAMPLE No use of fossil fuels*

#### 3.1.2.6 Limit

Maximum numerical value that **shall not** be exceeded by the relevant pass/fail metric

*EXAMPLE The upfront carbon limit for New Homes shall be less than X kg$CO_2$e/$m^2$ GIA.*

#### 3.1.2.7 Target

Minimum numerical value that **shall** be met or exceeded by the relevant pass/fail metric.

*EXAMPLE Annual on-site renewable electricity generation target for new office buildings commencing on site in 2030 to be at least Y kWh/$m^2$ building footprint/year*

### 3.1.3 Sectors

#### 3.1.3.1 Commercial Residential

Premises used for the provision of accommodation for students studying at a higher education institution (student residences); or residential accommodation, healthcare and assistance – particularly for the elderly and those with chronic illness or disability (care homes).

#### 3.1.3.2 Culture and Entertainment

Building used for performance and interval type activities (e.g., theatres, concert halls, cinemas), for collection-based activities (e.g., museums, art galleries, libraries), and for archive facilities. Excludes places of worship.

#### 3.1.3.3 Data Centres

All buildings, facilities and rooms that contain enterprise servers, server communication equipment, cooling equipment and power equipment, and provide some form of data service with more than 100kW of ICT load (e.g., large scale mission critical facilities all the way down to 'edge data centres').

#### 3.1.3.4 Healthcare

Facilities that provide same-day healthcare or surgical services, including diagnostic and preventive procedures (health centres); general medical and surgical services, including for critical access, children and community or long stay (hospitals); emergency response services associated with medical emergencies (ambulance stations); or mental health services.

Includes public and private sector facilities.

Excludes care homes (included under Commercial Residential). Excludes health services such as dentists and opticians located in retail units.

### 3.1.3.5 Higher Education

Premises used for higher education, including public and private colleges (e.g. Christ Church College, Oxford University) and universities.

Includes seminar/teaching areas; library/learning centres; and lecture theatres and workshops.

Excludes areas that are better aligned with another sector (e.g., student accommodation (Commercial Residential) or research labs (Science and Technology)) (see section 4.2.1.1).

### 3.1.3.6 Homes

Premises used for residential accommodation, including houses and blocks of flats. These may serve as primary residences for individuals or families, and can be designed as single-family homes or multi-family dwellings (e.g., block of flats or apartments).

Includes detached houses, semi-detached houses, terraced houses, bungalows, and both converted and purpose-built blocks of flats. Within blocks of flats, this includes all internal spaces to the demise, plus shared areas and services (e.g., corridors, reception, lifts).

Excludes buildings originally built as homes but now used for non-domestic purposes, or those categorized under Commercial Residential.

### 3.1.3.7 Hotels

Premises used for renting overnight accommodation on a room/suite and nightly basis, typically including: a bath/shower and other facilities in guest rooms; daily services available to guests including housekeeping/laundry; a front desk/concierge; and food and drink services (may be for non-guests too). A hotel is typically majority-owned by a single entity.

Includes bedrooms, common areas, and back-of-house.

### 3.1.3.8 Offices

Premises in which business, clerical, voluntary, charitable or for-profit professional activities are undertaken.

### 3.1.3.9 Retail

Premises used for retail sale of products (shops); the provision of cosmetic treatments and hairdressing services (salons); the display of goods for sale (showrooms); or the preparation and sale of ready-to-eat food and beverages (restaurants and takeaways). Or premises used as retail outlets located in warehouse-style buildings (i.e. large individual buildings with a high ceiling and open plan interiors, often displaying goods on industrial racks rather than conventional retail shelving) (retail warehouses). Or premises with a bar and one or more public rooms licensed for the sale and consumption of alcoholic drinks (public houses).

Includes landlord areas and retail areas of commercial centres / shopping centres.

Excludes areas of shopping centres that are better aligned with another sector (e.g., Culture and Entertainment areas) (and see section 4.2.1.1).

### 3.1.3.10 Schools

Premises used for educational programmes or daytime supervision/recreation for young children (Nurseries); the education of children up to age 11 (Primary Schools); or providing children with part, or all, of their secondary education, typically between the ages of 11-18 (Secondary Schools), including 6th form colleges (even when unconnected to school with other ages).

Includes premises for children with special educational needs and premises for specialist training (e.g., dance academies, music schools or other full time vocational settings up to age 18), and all internal spaces for general functions plus curriculum delivery & support (e.g., admin office), incl. specialist curriculum spaces in secondary schools.

### 3.1.3.11 Science and Technology

Facilities used for research laboratories; pharmaceutical research and development, and manufacturing; computational science; or other science and technology-based activities.

Includes all internal lab areas and associated support areas e.g., offices, server rooms.

### 3.1.3.12 Sport and Leisure

Premises used for sporting, exercise and/or leisure activities; or meetings and activities of associations dedicated to a particular interest or activity (e.g., political clubs, social clubs etc.) as well as associated support areas e.g., circulation, café, reception, offices, education spaces.

Includes dry areas (e.g., sports halls, climbing, squash courts, etc.); wet areas (e.g., pool halls, jacuzzi, spa, steam rooms, saunas, and wet changing areas) fitness areas (e.g., air conditioned gyms, dance/spin/yoga studios) plus indoor velodromes and indoor training grounds.

Excludes ice rinks and stadia, and external sports facilities.

### 3.1.3.13 Storage and Distribution

Premises used for temporary storage and redistribution of goods, manufactured products, merchandise or raw materials, prior to their distribution for sale (Warehouses); or bulk storage of items, with minimal or transient staff occupancy (Stores).

Includes cold stores; conditioned and unconditioned storage; and distribution sorting (including main hub and final mile, and automated or manual picking).

## 3.1.4 Building and construction terms

### 3.1.4.1 Gross internal area (GIA)

Generally, the area of a building measured to the internal face of the perimeter walls at each floor level, as defined in 'RICS Guidance Note, Code of measuring practice, 6th edition' by the Royal Institution of Chartered Surveyors or the latest valid version.

### 3.1.4.2 Net internal area (NIA)

Generally, the usable area within a building measured to the internal face of the perimeter walls at each floor level, as defined in *RICS Code of Measuring Practice*.

### 3.1.4.3 New Building

As defined in section 4.2.1 and Table 4.

### 3.1.4.4 Existing Building

As defined in section 4.2.1 and Table 4.

### 3.1.4.5 Heritage Building

Refers to heritage assets (designated and non-designated), as defined in national planning policy (including the National Planning Policy Framework (NPPF) in England and equivalent frameworks in Scotland, Wales and Northern Ireland). They range from formal designations such as listed buildings, conservation areas and locally listed buildings; to informally protected non-designated buildings; and to buildings of traditional construction, regardless of their status. A heritage building may be of traditional or modern construction.

*NOTE At present, all heritage buildings should be assessed as per the definitions in Table 4 and Table 5 and are encouraged to pursue verification to achieve 'Net Zero Carbon Aligned Building' status where appropriate. However, in recognition that targeting all the requirements may not be appropriate within a heritage context, a working group of heritage specialists have developed optional decarbonisation guidance for heritage assets. This marks a step towards the evolution of heritage specific net zero carbon guidance which could be developed to support the Standard. Further information can be found on the UK Net Zero Carbon Buildings Standard website.*

### 3.1.4.6 New Works

As defined in section 4.2.1 and Table 5.

### 3.1.4.7 Retrofit Works

As defined in section 4.2.1 and Table 5.

#### 3.1.4.8 Reportable Works

As defined in section 4.2.1 and Table 5.

#### 3.1.4.9 Non-Reportable Works

As defined in section 4.2.1 and Table 5.

#### 3.1.4.10 New Area

Also known as New NIA. Areas of floor where construction of structure (*RICS PS* building element categories 1.1 to 2.3) was completed within the five years prior to the Reporting Period End Point (RPEP, see section 4.2.4), measured using NIA.

#### 3.1.4.11 Existing Area

Also known as Existing NIA. All other areas of floor not covered by 3.1.4.10, measured using NIA.

#### 3.1.4.12 Additional Use

Areas of floor (either new or existing) defined in section 5.2.1.3 that may be exempted from meeting energy use intensity limits when submetered. These areas have a non-negligible impact on a building's energy use, but no data exists at this time, meaning that no limits can be set. These areas still require assessment, reporting and submission.

#### 3.1.4.13 Shell and Core

Covers the essentials of the building, with the outside looking complete but the inside not fully fitted out yet. Refer *RICS PS* Appendix P for detailed guidance, but this often includes:

- Facilitating works;
- Structure (superstructure & substructure);
- Envelope (facade and roof);
- Core life safety equipment;
- Centralised plant, and supply and distribution to common/landlord areas;
- The finishes and FF&E of common/landlord areas, which could include:
  - Circulation and escape cores;
  - Amenities;
  - Doors & ironmongery;
  - Entrances;
  - Servicing/delivery zones;
  - Centralised catering;
  - Centralised WCs and sanitary facilities;
- External works.

### 3.1.4.14 Cat A

Shorthand for 'Category A'. Usually undertaken by landlord or building owner, either to remediate anything left by a previous occupant, and to prepare tenanted spaces for market. Refer *RICS PS* Appendix P for detailed guidance, but this often includes:

- Facilitating works to modify the shell and core build or previous Cat A fit-out (this could include structural work);
- Modifications to shared areas;
- Life safety elements incl. fire detection, fire suppression, and security systems;
- Building services provided by the landlord to tenanted areas, not included in shell and core (e.g., on-floor distribution and equipment, integrated lighting, sanitaryware, drainage)
- Finishes in tenanted areas outside of shell and core scope such as:
  - Raised access floors;
  - Floor coverings;
  - Ceilings with integrated lighting;
  - Decoration to perimeter walls;
- Fixed FF&E (furniture, fixtures and equipment) in tenanted areas including kitchens outside of shell and core scope, depending on lease agreement.

### 3.1.4.15 Cat B

Shorthand for 'Category B'. Works required in addition to the Cat A works to convert the space to meet the specific requirements and spatial layout of the occupier. Refer *RICS PS* Appendix P for detailed guidance, but this often includes:

- Partitioning, glazing & internal joinery;
- Information, communication and technology (ICT) and audio-visual (AV) equipment;
- Equipment for dedicated serviced areas such as kitchens and labs;
- Tenant modifications or provisions for on-floor building services to suit the occupier's needs (e.g. cellularisation of spaces, addition of meeting room spaces, shower and changing rooms);
- Feature lighting;
- Loose FF&E (furniture, fixtures and equipment);
- Final finishes or specialist linings (e.g. floors, blinds, custom joinery, signage, ceilings);
- White goods;
- Storage walls and lockers.

### 3.1.4.16 Date of Practical Completion

The point at which the works are sufficiently complete, as per the date given in the primary building contract.

#### 3.1.4.17 Occupancy rate

As defined in section 5.2.5.

#### 3.1.4.18 District heating and/or cooling network

A system that distributes heating or cooling through a network of pipes to one or more buildings, including communal networks (which serve multiple units within a single building), district networks (which serve multiple buildings), and ambient loops (which allow energy exchange between buildings). The system can utilise centralised or decentralised energy sources.

#### 3.1.4.19 Electricity demand management

The ability of a building or business to manage its electricity use by either shifting its requirements in time or reducing its requirements for energy, controlling the electricity demand according to the time of the day, to contribute to achieving lower peak demand on the national grid.

#### 3.1.4.20 Biofuel (first-generation)

Liquid or gaseous fuel derived from food or feed crops, including fuels derived from crops that could otherwise be used for food or feed production. Fuels derived from food or feed crops are classified as first-generation biofuels regardless of whether they are sourced from surplus, by-products, or alternative markets.

#### 3.1.4.21 Biofuel (second-generation)

Fuel derived from non-food biomass, including lignocellulosic material (e.g. wood pellets, willow, miscanthus and other energy crops grown on land with low indirect land-use-change risk), residues, waste oils and fats, or biodegradable wastes including landfill gas and sewage-treatment gas.

#### 3.1.4.22 Waste-derived biofuel

Fuel generated from organic wastes or residues that would otherwise decompose or be incinerated, excluding purpose-grown crops.

### 3.1.5 Other

#### 3.1.5.1 Conformity

Fulfilment of all applicable requirements of this Standard, including verification.

## 3.2 Abbreviated Terms

| Abbrv. | Full term | Reference |
|---|---|---|
| Cat A | Category A | 3.1.4.14 |
| Cat B | Category B | 3.1.4.15 |
| CPA | Common Parts Area, typically referring to areas shared by multiple occupants, such as lobbies, stairwells, corridors etc. | - |
| DHCN | District Heating and/or Cooling Networks | - |
| EUI | Energy use intensity | - |
| FF&E | Fittings, furnishings and equipment | - |
| GIA | Gross internal area | 3.1.4.1 |
| GWP | Global warming potential | 3.1.1.4 |
| ICROA | International Carbon Reduction and Offset Alliance (https://icroa.org/endorsed-organisations/) | - |
| ICVCM | Integrity Council for Voluntary Carbon Markets (https://icvcm.org) | - |
| IPCC | The Intergovernmental Panel on Climate Change | - |
| LCA | Life Cycle Assessment | 3.1.1.10 |
| NIA | Net internal area | 3.1.4.2 |
| NZCBS Ltd | Net Zero Carbon Buildings Standard Limited | Annex D |
| REGOs | Renewable Energy Guarantees of Origin | 3.1.1.13 |
| RICS | Royal Institution of Chartered Surveyors | - |
| UK NZCBS | UK Net Zero Carbon Buildings Standard | - |
| UPRN | Unique Property Reference Number (www.gov.uk link) | |
| WLC | Whole Life Carbon | 3.1.1.1 |
| WLCA | Whole Life Carbon Assessment | 3.1.1.10 |

# 4. General principles

## 4.1 Using this Standard

### 4.1.1 Language used within this Standard

This Standard contains requirements, recommendations, permissions and informative content. Table 1 describes the different types of content, how each type can be identified and requirements for conforming with the Standard.

*Table 1 Types of content, and conformity requirements*

| Type of content | Description | Required for conformity? | Identified by |
|---|---|---|---|
| Requirement | Something that must be fulfilled, with no deviation. | Yes | Use of the word '**shall'.** |
| Recommendation | Something that is recommended or preferred. | No | Use of the word '**should'.** |
| Permission | Something that is permitted, within the limits of the associated requirement or recommendation. | No | Use of the word '**may'.** |
| Informative content | Something that is intended to inform only and is not a requirement, recommendation or permission. | No | The words 'shall', 'should' and 'may' are not used; or content prefixed with *NOTE*; or for whole sections of informative content, the heading will state: '**(For information)**'. |

### 4.1.2 Versions

The Standard may be updated and new versions published periodically; Table 2 shows all versions published to-date. Future versions of the Standard will be available on the UK Net Zero Carbon Buildings Standard website (www.nzcbuildings.co.uk). Only Version 1 may be used in gaining conformity, previous versions **shall not** be used. Where newer versions are available, it is possible that these will preclude the use of Version 1. The claimant should check that this is the most recent version of the Standard, and is still valid, before starting to use it.

*NOTE Future versions will consider the latest published carbon and energy budgets. Depending on emissions that have occurred by that time, the Standard's limits and targets may be adjusted to maintain the decarbonisation trajectory towards the UK's carbon budgets and targets. This will not affect buildings that have already achieved verification.*

*Table 2 Versions of this Standard*

| Version number | Publication date | Notes (most recent version only) |
|---|---|---|
| Version 1, Rev 1 | April 2026 | Correction to Conditioned Storage limits under the 'stepped route' and other minor amendments. |
| Version 1 | March 2026 | Legibility improvements and technical updates throughout all sections in response to Pilot testing, feedback and input from Verification Administrator; Addition of mandatory sections on Verification (6) and Communication (7); Numerical edits in response to pilot testing and updates to the balancing model (Annex A); Edits to Proforma (Annex B); New annexes on other schemes and standards deemed to satisfy one or more requirements of the Standard (Annex C), PC-on-track verified checks (Annex E) and Landlord and tenant routes (Annex F). |
| Pilot version rev2 | April 2025 | |
| Pilot version rev1 | October 2024 | |
| Pilot version | September 2024 | |

### 4.1.3 Summary of metrics and requirements (for information)

Table 3 provides an overview of most of the pass/fail metrics and requirements, and reporting metrics, in this version of the Standard.

Section 5 of the Standard outlines these metrics and requirements in full and provides the detail of variations between building/works type, sector and situation. Annex A provides the limits and targets where relevant.

*Table 3 Overview of pass/fail metrics and requirements, and reporting metrics*

| Aspect | Pass/fail metrics and requirements | Reporting metrics |
|---|---|---|
| Embodied carbon | Upfront carbon limits<br>*Life cycle embodied carbon limits (future versions only)* | Life cycle embodied carbon<br>Upfront carbon with generic material specifications |
| Operational energy | Energy use intensity limits (typically; in some sectors, alternative metrics are used, see Table 10) | Annual operational carbon emissions intensity |

| Aspect | Pass/fail metrics and requirements | Reporting metrics |
|---|---|---|
| On-site renewable electricity generation | Annual on-site renewable electricity generation targets | Total annual on-site renewable electricity generation<br>Annual on-site renewable electricity generation that is used on site<br>Annual on-site renewable electricity generation that is exported<br>On-site renewable electricity generation capacity |
| Operational water use | n/a | Annual operational water use<br>Annual operational water carbon emissions |
| Fossil fuel free | Confirmation there is no fossil fuel use on site, except under allowed exemptions | n/a |
| Electricity demand management | n/a | Date/time and electricity demand in certain percentiles of energy demand |
| District heating and/or cooling networks | Carbon content limit for heat/coolth supplied | Energy used by the district energy scheme, associated with generating and distributing the heat/coolth supplied<br>Carbon emissions associated with heat/coolth supplied |
| Heating and cooling delivered to the building | Annual space heating/cooling delivered to the building limit *(some sectors only)*<br>Peak energy delivered for space heating/cooling limits *(some sectors only)* | n/a |
| Refrigerants | GWP limit of refrigerants | Annual carbon impact of refrigerant leakage for GHGs covered by Kyoto protocol<br>*Optional: Annual carbon impact of refrigerant leakage of other GHGs* |
| Carbon offsetting | Offsetting is optional, but where emissions are offset and reported, section 5.10 applies. | |

# 4.2 General assessment, submission and limits requirements

## 4.2.1 Building types and works types

The building type **shall** be identified according to Table 4, and the works type (if any) **shall** be identified according to Table 5. GIA and NIA measurement **shall** be based on the completed works/building throughout the Standard.

*NOTE For further information on Heritage Buildings, refer to section 3.1.4.5*

*Table 4 Building types*

| Building type | Criteria |
|---|---|
| New Building | Either:<br>• ≥50% of NIA is new (see section 3.1.4.10), or<br>• building is single-storey and all elements above the ground floor slab are new, or<br>• building has previously been defined as a New Building as part of a previous submission in accordance with this Standard. |
| Existing Building | All other buildings |

*Table 5 Works types*

| Works type | Criteria |
|---|---|
| New Works | Either:<br>• construction resulting in ≥50% of NIA being new (see section 3.1.4.10), or<br>• building is single-storey and all elements above the ground floor slab are new. |
| Retrofit Works | Not New Works, and either:<br>• ≥10% of original area of thermal envelope is new, upgraded or replaced[a], or<br>• ≥10% of original glazed area is new, upgraded or replaced[a]. |
| Reportable Works[c] | Not Retrofit Works, and either:<br>• value of the works ≥£100,000[b], or<br>• new or replacement heating, or cooling, or ventilation plant or systems, or<br>• replacement of lighting systems including associated fittings and electrics. |
| Non-Reportable Works | All other works |

[a] e.g., including replacement or addition of insulation, cladding, glazing etc.

[b] total material, labour and design cost ex VAT.

[c] first fit-out of a building not included; it is part of the relevant New/Retrofit Works (see section 5.1.2.3).

#### 4.2.1.1 Typical combinations of buildings and works (for information)

Table 4 and Table 5 are independent of each other, and dictate the way the Standard is used. This section notes four of the most typical scenarios, and outlines how sections 5.1 and 5.2 are used to assess embodied carbon and operational energy use respectively. Sections 5.3 onwards give requirements for other metrics.

**Existing Building without any works**. No assessment of embodied carbon is required under section 5.1 if no New, Retrofit or Reportable Works have been completed recently. Operational energy is assessed under section 5.2, and either the 'one-go route' or 'stepped route' is chosen to determine the limits that need to be met (the stepped route gives an option where the building cannot meet the one-go route limits today).

**Existing Building with Retrofit Works**. The embodied carbon is assessed under section 5.1 and compared to the Retrofit Works limit. Operational energy is assessed under section 5.2, and either the 'one-go route' or 'stepped route' is chosen to determine the limits that need to be met (the stepped route gives an option where the building cannot meet the one-go route limits today).

**New Building without any works**. Where the building has previously been defined as a New Building as part of a previous successful verification, it retains that building classification. However, if no New, Retrofit or Reportable Works have been completed since the previous successful verification, no assessment of embodied carbon is required under section 5.1. Operational energy is assessed under section 5.2, and compared to the New Building limits.

**New Building, New Works**. Where enough new construction has taken place that ≥50% of the building's completed NIA is new, then it is classified as a New Building, New Works, regardless of the age of the rest of the building. The embodied carbon is assessed under section 5.1 and compared to the New Works limit. Operational energy is assessed under section 5.2, and compared to the New Building limits.

*NOTE A significant number of other building/works combinations exist too, that are not detailed here.*

### 4.2.2 Sectors and subsectors

The Standard **shall** only be applied to the sectors and subsectors shown in Table 6. See section 3.1.3 for definitions of each sector.

*NOTE 1 Subsectors are used as part of section 4.2.5.2 when setting area-weighted limits/targets for the building. Only the sector is used when classifying the building.*

*Table 6 Sectors and subsectors covered by the Standard*

| Sector | Subsectors that may exist within this sector |
|---|---|
| Commercial Residential | Student Residences, Care Homes |
| Culture and Entertainment | Performance (e.g., theatre, cinema, opera house), Collection (e.g., library, visitor centre, museum, gallery), Archives |
| Data Centres | Low-Utilisation (<50% utilisation of $m^2$ of IT space), High-Utilisation (≥50% utilisation of $m^2$ of IT space) |
| Healthcare | Acute Trust, Care Trust, Community Trust, Mental Health & Learning Trust, Ambulance Trust |
| Higher Education | n/a |
| Homes | Single Family Homes, Flats |
| Hotels | n/a |
| Offices | General, Call Centres, Trading Floors |
| Retail | Supermarket, High Street Units & Department Stores, F&B Without Catering (i.e. only cold/hot drinks or cold food, no on-site kitchen), F&B With On-Site Catering (e.g., restaurant, pub, fast food with on-site food preparation / catering), Landlord Areas Within Commercial/Shopping Centres, Warehouse |
| Schools | Early Years, Primary, Secondary including Special Educational Needs (SEN) |
| Science and Technology | n/a |
| Sport and Leisure | Dry, Wet, Fitness |
| Storage and Distribution | Unconditioned, Conditioned, Cold Store |

The building **shall** be classified either as a single sector from Table 6, or as Mixed-Use covering several sectors from Table 6, following these requirements in order:

1. All areas of floor within the building **shall** be classified based on their sector (and subsector where appropriate) from Table 6, or as 'unclassifiable'. If ≥30% of the NIA of the building is unclassifiable, the building **shall not** claim conformity to the Standard.
   *NOTE 2 Within a building that conforms to the Standard, there may still be unclassifiable areas. These are still subject to all requirements, but wouldn't contribute to determining the building classification, or setting limits/targets.*
2. The building's overall classification **shall** be based on the sectors present throughout it, rather than any subsectors.

*NOTE 3 E.g., if an area of floor contains both Performance area and Archive area (both of which are subsectors of the Culture and Entertainment sector), then the whole area is just 'Culture and Entertainment' for the purposes of setting the building classification. The subsectors are still used for other requirements of the Standard, such as setting area-weighted limits/targets for the building in section 4.2.5, just not for the classification of the building itself.*

3. The building's overall classification, and any limit calculation (see section 4.2.5.2) may ignore any sectors whose areas sum to <10% of the building's NIA.
   *NOTE 4 E.g., if 4% of a building's NIA is Performance, and the same is Archive, then in total, only 8% of the building's total NIA would be classified as the Culture and Entertainment sector. As such, the claimant could choose to ignore this when classifying the building.*

4. Once 1-3 are complete, to classify the building,:
   - where all areas of the building are the same sector, the building **shall** be classified as that sector.
   - where a building contains multiple sectors, the building **shall** be classified as Mixed Use and the sectors within the building **shall** be communicated clearly (see section 4.2.7).

   *NOTE 5 Using the example from note 4 of this section, if 8% of the building is Culture and Entertainment and 92% is Offices, then the claimant can choose whether to include the Culture and Entertainment area in the classification and limit calculation. This determines both whether to classify the building as Offices or as Mixed-Use (containing Offices, and Culture and Entertainment), and whether to use Equation 1a to calculate a sector-weighted limit. Note that the whole building is compared to the limits – so even if this example is classified as Offices with the Culture and Entertainment area ignored from limit-setting, the carbon and energy used in that area would still be assessed/measured for comparison to the limits.*

### 4.2.3 Scope of assessment

The object of the assessment **shall** be the whole site and construction works according to the *RICS PS* section 4.3, unless site-wide works and/or below-ground works are shared with other buildings. Where this is the case, the scope may be reduced as follows:

- Areas serving only the building being assessed **shall** be included in the scope;
- Where areas of site-wide works and/or below-ground works serve other buildings only, those areas may be ignored;
- Where areas of site-wide works and/or below-ground works are shared between buildings, areas may be apportioned based on the above-ground GIAs of each building.

In all cases, future phasing of works may be taken into account by apportioning based on the expected above-ground GIAs of each building once the phased works are all complete.

*NOTE E.g., where a site contains multiple buildings that share landscaping and a basement, the scope of assessment can be reduced to only include an appropriate part of that landscaping and basement. If an entire area clearly serves another building (such as a private car park), then that area can be allocated in*

*full to that building. Where items are less distinctly 'owned' by a single building (such as a shared retaining wall), apportioning by area is allowed. This approach can be applied even if the other buildings haven't been completed yet, provided documentation is supplied to demonstrate how this phasing will happen.*

Building-level assessment and apportioning of shared works **shall** be in accordance with *RICS PS* section 3.5. The scope of external works impacts assessed **shall** include all excavations and site preparations required to facilitate the new assets.

For multi-building developments of the Single Family Homes subsector (see section 4.2.1.1), assessments may be carried out across the whole development, rather than for each individual home.

All life cycle stages and module D (separately) **shall** be assessed (see Figure 1).

The assessment **shall** use the most up-to-date information available at or after the Reporting Period End Point (see section 4.2.4), unless other guidance or requirements are provided in the relevant section of the Standard.

## 4.2.4 Reporting periods

### 4.2.4.1 Reporting Period End Point

A date **shall** be set as the Reporting Period End Point (RPEP), which **shall** be set ≥1 year after the minimum occupancy rate has been met (see section 5.2.5).

This should be predicted early in design, with the prediction submitted when registering the building (see claimant verification process in Section 6.2.2), and the final date confirmed with the verifier once submitting information to them.

*NOTE 1 Where a New Building has not been verified previously, the earliest RPEP would be set at a date approximately one year after the minimum occupancy rate (section 5.2.5) has been met, allowing one year of data on operational energy (and other associated aspects such as on-site electricity generation) to have been collected. However, some may choose to align the RPEP with other key dates, such as the end of a calendar, financial, or academic year.*

Where the building has previously been verified against the Standard, the RPEP should be set 12 months after the RPEP from the previous verification, to ensure continual conformity with the Standard (see Figure 3 and section 4.3), and **shall not** be set any sooner (to avoid double-counting).

*NOTE 2 Where the RPEP for a subsequent assessment is set at a date more than 12 months after the RPEP from the previous verification, this will lead to a gap in the assessment, reporting and submission of operational energy data, resulting in a gap in claim validity that must be communicated (see section 7).*

### 4.2.4.2 Embodied and Operational Reporting Periods

The Embodied Reporting Period (ERP) determines which programmes of works are assessed according to section 5.1. The Operational Reporting Period (ORP) determines the period over which the operational aspects of the building's use are assessed according to sections 5.2 to 5.9. Both the ERP and ORP are used when considering offsetting in section 5.10.

The ERP **shall** start at either:

- five years prior to the Reporting Period End Point (RPEP); or
- the previous RPEP, if the building was previously verified within the last five years.

The ORP **shall** start one year prior to the RPEP.

The ERP and ORP **shall** end at the RPEP.

See Figure 2 for a visual representation for first verification of a building. See Figure 3 and Figure 4 for second verification examples.

*NOTE See section 6 for timing requirements of verification, and Annex E for timing requirements of optional checks at practical completion.*

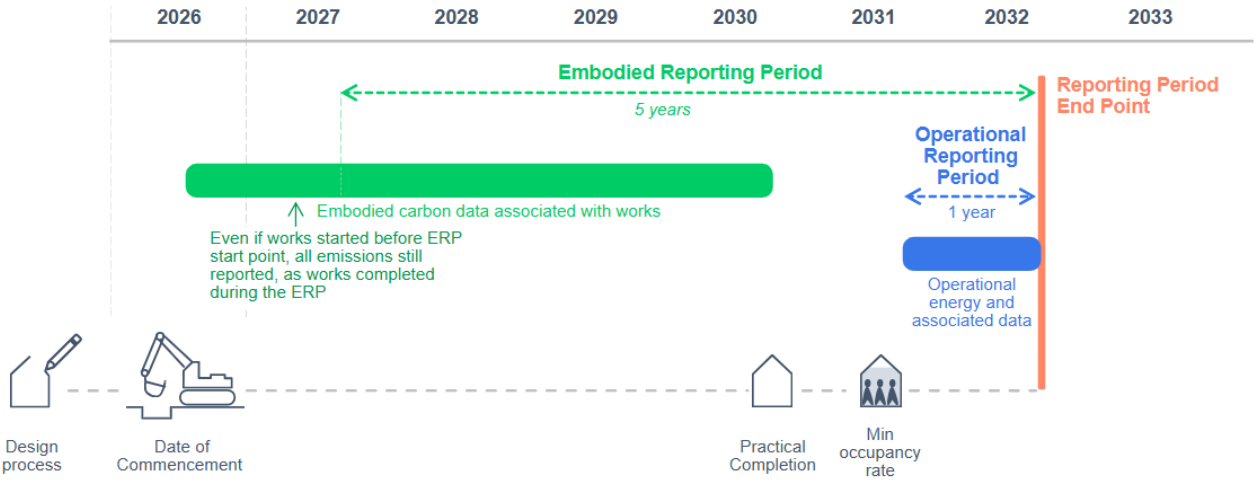



*Figure 2 Reporting Period End Point (RPEP), Embodied Reporting Period (ERP) and Operational Reporting Period (ORP) where building has not previously been verified. Note that all embodied carbon from any projects completing within the ERP is assessed (see section 5.1.2).*

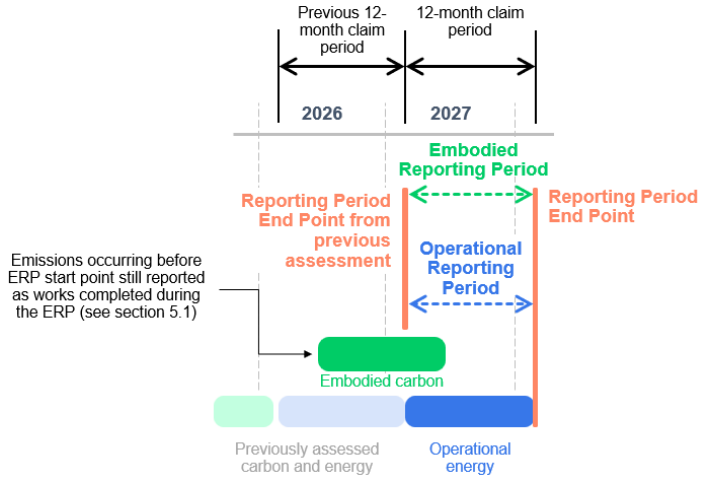



*Figure 3 Typical Reporting Period End Point (RPEP), Embodied Reporting Period (ERP) and Operational Reporting Period (ORP) for a second assessment, reporting and verification of a building. Note that the ERP for the second assessment starts before the previous RPEP, but all emissions from that programme of works are still assessed and reported.*

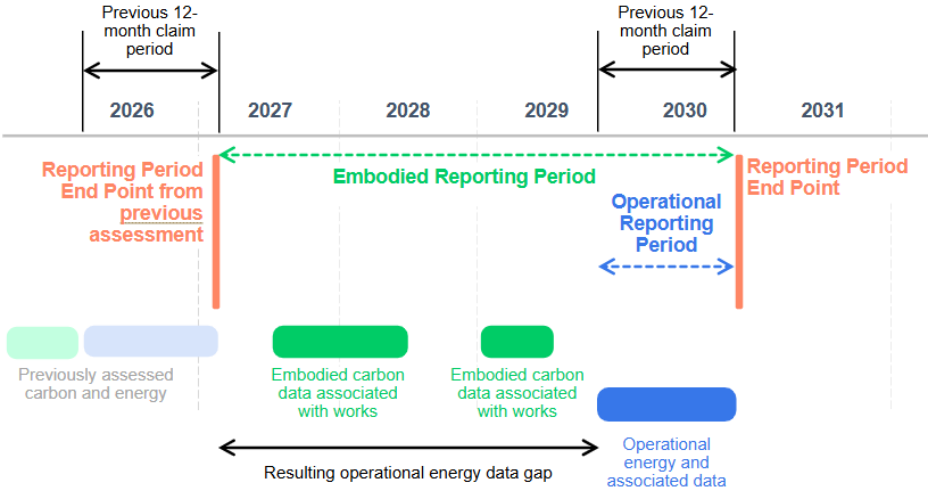



*Figure 4 Where a gap longer than 12 months exists between RPEPs, this will lead to a gap in operational data, and thus a gap in claim periods that must be communicated (see section 4.3). Here, the ERP still starts the day of the previous RPEP as this gives an ERP of less than 5 years.*

## 4.2.5 Pass/fail metrics

### 4.2.5.1 Limits and targets

The following requirements **shall** apply to all areas of the building (even those not classified as a sector), unless specified otherwise elsewhere in the Standard:

- All relevant limits (see section 3.1.2.6) **shall not** be exceeded, and the results for those pass/fail metrics should be as low as possible.
- All relevant targets (see section 3.1.2.7) **shall** be met or exceeded, and the results for those pass/fail metrics should be as high as possible.
- Embodied limits (e.g., upfront carbon limits) **shall** be based on the works type (see section 4.2.1) and the requirements of section 5.1.
- Operational limits and targets (e.g., operational energy limits, on-site renewable targets) **shall** be based on the building type (see section 4.2.1) and the requirements of sections 5.2 to 5.9.

### 4.2.5.2 Limit calculation based on sector and area type

Where a building contains multiple sectors/subsectors and/or a combination of New Areas and Existing Areas (see section 3.1.4.10 and 3.1.4.11), building-specific limits are calculated by using Equations 1a and 1b overleaf to combine values taken from Annex A. The calculated limits apply to the whole building, even those areas not used in the equations themselves, unless stated elsewhere in the Standard.

*NOTE 1 Both equations calculate automatically in the submission proforma (see Annex B).*

**Multiple sectors/subsectors**

Where the building contains areas of floor classified as different sectors or subsectors, Equation 1a **shall** be used to calculate sector-weighted limits. Common areas serving several sectors/subsectors **shall** be apportioned between the areas that they serve.

Floor areas may be omitted from Equation 1a where the total area of floor classified as a single sector (summed across the whole building) is <10% of the building's NIA (see section 4.2.1.1).

Floor areas **shall** be omitted from Equation 1a where either:

- no limit exists for that sector/subsector in Annex A, or
- the equation is being used to determine the sector-weighted operational energy limit (see section 5.2.7) and the area is an Additional Use Area (see section 3.1.4.12 and 5.2.1.3).

*Equation 1a Sector-weighted limit calculation*

$L_{SW} = \%_1 \times L_1 + \%_2 \times L_2 + \ldots + \%_n \times L_n$

Where:

- $L_{SW}$ = sector-weighted limit
- $\%_X$ = percentage of the building's NIA that is classified as sector/subsector x, where the sum of $\%_1$ to $\%_n$ equals 100%;
- $L_X$ = limit for sector x, based on the building type, works type and scope in Annex A.

**New and existing areas**

Where ≥10% and <50% of the building's NIA (at the Reporting Period End Point) is New Area, Equation 1b **shall** be used to calculate area-weighted limits.

Floor areas may be excluded where the equation is being used to determine the area-weighted operational energy limit (see section 5.2.7) and the area is an Additional Use (see sections 3.1.4.12 and 5.2.1.3).

*NOTE 2 Where less than 10% of the building's NIA is new, the limits and targets are based wholly on the Existing Building and Retrofit Works limits in Annex A. Where at least 50% of the building's NIA is new, the limits and targets are based wholly on the New Building and New Works limits in Annex A.*

*Equation 1b Area-weighted limit adjustment (new and existing)*

$L_{AW} = \%_N \times L_N + \%_E \times L_E + \%_N \times (L_N - L_E)$

Where:

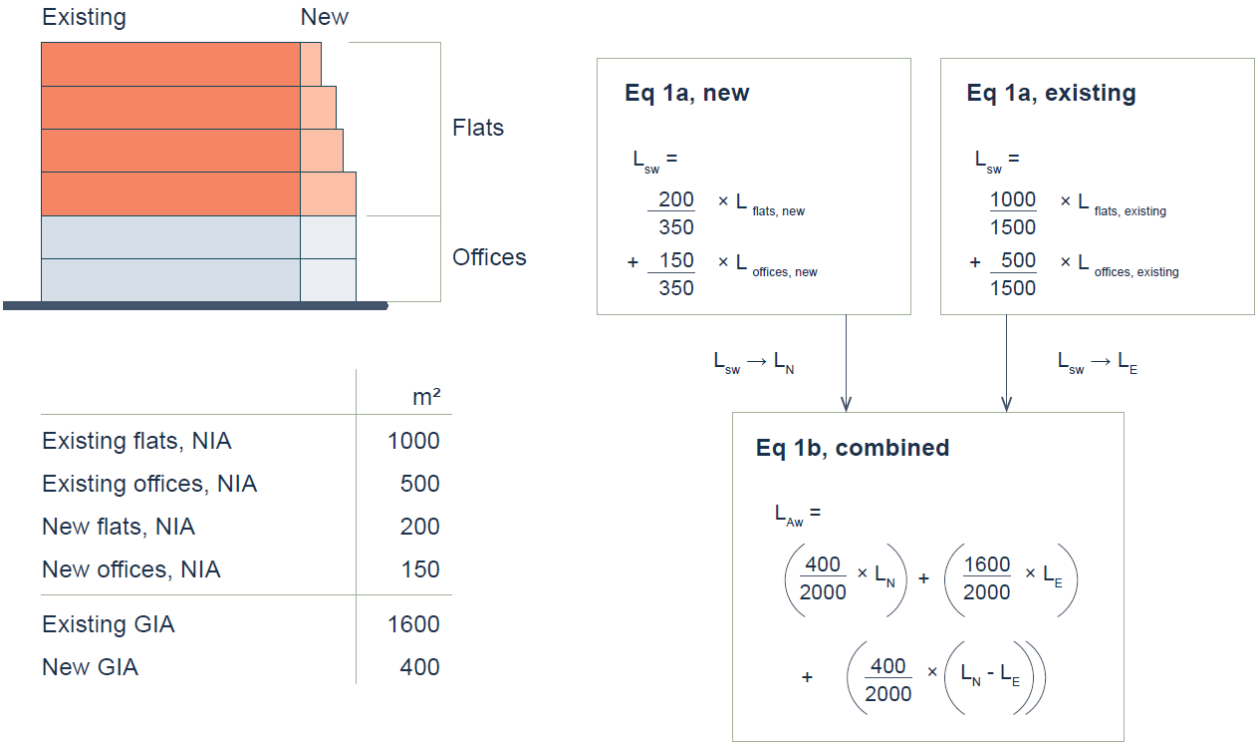
- $L_{AW}$ = area-weighted limit
- $\%_N$ = percentage of the building's GIA that is New Area;
- $\%_E$ = percentage of the building's GIA that is Existing Area, where the sum of $\%_E$ and $\%_N$ equals 100%.

Where the building or works only contain one sector/subsector:

- $L_N$ = limit, based on the New Building or New Works table in Annex A;
- $L_E$ = limit, based on the Existing Building or Retrofit Works table in Annex A.

Where multiple sectors/subsectors are present, values for $L_N$ and $L_E$ **shall** be calculated by first using Equation 1a twice, across all sectors/subsectors present, as follows:

- $L_N$ = $L_{SW}$ (from Equation 1a) considering only the New Areas, and using $L_X$ values from the New Building and New Works tables in Annex A; and
- $L_E$ = $L_{SW}$ (from Equation 1a) considering only the Existing Areas, and using $L_X$ values from the Existing Building and Retrofit Works tables in Annex A.




| | m² |
|---|---|
| Existing flats, NIA | 1000 |
| Existing offices, NIA | 500 |
| New flats, NIA | 200 |
| New offices, NIA | 150 |
| Existing GIA | 1600 |
| New GIA | 400 |

*Figure 5 Worked example (for information only) of Equations 1a and 1b.*

*NOTE 3 Equation 1a is based on NIA so that unusable space is excluded from that calculation to avoid issues allocating between different sectors, while Equation 1b is based on GIA to ensure that all shared and unusable spaces are included in the calculation.*

*NOTE 4 For operational energy limits, Section 5.2.7.1 requires that either 'one-go route' or 'stepped route' limits are used – this choice determines which values feed into $L_E$.*

### 4.2.5.3 Limits and dates

Most limits in Annex A vary by year based on a Date of Commencement of the works (see section 4.2.6), however some are based on other variables. Further requirements for each are outlined in the following sections:

- Upfront carbon limits – see section 5.1.6.1;
- Energy use intensity limits – see section 5.2.7.1;
- Annual space heating limits – see section 5.8.5.

*NOTE 1 To reduce the risk of limits and targets not being achieved, it is recommended to design to the limits indicated for the year the works are expected to commence on site, allowing for an appropriate contingency.*

*NOTE 2 Verification rules allow one year of leeway to the applicable limits where the anticipated Date of Commencement has been declared at the point of registering the building (see section 6.2.2), and where delayed commencement can be evidenced as being caused by factors outside the claimant's control. For more details, refer to verification guidance available on the UK Net Zero Carbon Buildings Standard website.*

## 4.2.6 Date of Commencement

This section outlines how the Date of Commencement is identified for different types of works.

*NOTE See note in section 4.2.5.3 relating to delays.*

### 4.2.6.1 New Works

For New Works (see section 4.2.1), the Date of Commencement is when at least one of the following activities has been started:

- Excavation, digging out and preparation ground for foundations;
- Vibroflotation (stone columns) piling, boring for piles, or pile driving;
- Ground stabilisation works;
- Drainage work specific to the building(s) concerned;
- Where New Works involves the retention of existing elements (e.g., walls or floors), the activities listed in section 4.2.6.2 **shall** also indicate that the works have commenced.

*NOTE The following activities alone do not indicate that works have commenced: Removal of vegetation; demolition of previous buildings on the site; removal of topsoil; removal or treatment of contaminated soil; excavation of trial holes; dynamic compaction; or general site servicing works (e.g., roadways).*

### 4.2.6.2 Retrofit Works

For Retrofit Works (see section 4.2.1), the Date of Commencement is when at least one of the following activities has been started:

- Removal of permanent/fixed internal or external walls or windows;
- Removal of MEP services including heating, cooling or ventilation systems but excluding lighting;
- Demolition of structural framing or floors;
- Improvements to the thermal performance of the existing envelope;
- Modification of existing substructure.

### 4.2.6.3 Reportable Works

For Reportable Works (see section 4.2.1), the Date of Commencement is when at least one of the following activities has been started :

- Removal of existing finishes or MEP services that are due to be replaced as part of the Reportable Works;
- Installation of new finishes or MEP services.

### 4.2.7 General submission requirements

All assessed aspects **shall** be evidenced and submitted to the verifier (see section 6).

Assessment evidence for submission to the verifier **shall** include the following details:

- Full address and UPRN (where available) to aid the tracking of emissions through the life of a building, through various reporting periods and works;
- Information and calculations to substantiate any results submitted for verification;
- Information and calculations to determine the applicable building and works types (see section 4.2.1);
- Information and calculations to determine the applicable sector (or sectors, if Mixed-Use) and appropriate limit/target(s), NIAs and GIAs (see sections 4.2.1.1 and 4.2.5);
- Information and calculations where used to adjust pass/fail metrics for mixtures of sectors or works types (see section 4.2.5.2) including but not limited to:
  - The calculation working out;
  - Floor area measurements per sector and building type combination;
  - Building sectors present but excluded;
- Information and calculations showing items of the assessment that have been prorated with other buildings, including any planned future phasing of the works (see section 4.2.3).

For multi-building developments of the Single Family Homes subsector (see section 4.2.2), reporting and submissions may be aggregated across the whole development, rather than for each individual home.

The sector-specific information in Table 7 **shall** be included in the submission, wherever floor area is present that is classified as the relevant sectors/subsectors shown in the table.

*NOTE The Submission Proforma (see Annex B) also includes some additional information that must be reported, that is not mentioned in the Standard, for example GIA and NIA.*

*Table 7 Sector-specific information to submit*

| Sector/subsector | Information to submit |
|---|---|
| Commercial Residential | Provision of on-site medical care (yes/no). |
| Culture and Entertainment, Performance subsector | Visitor numbers per year;<br>Number of tickets sold per year;<br>Seats;<br>Theatre type i.e. "Receiving" or "Producing". |
| Culture and Entertainment, Collection subsector | Visitor numbers per year. |

| Sector/subsector | Information to submit |
|---|---|
| Culture and Entertainment, Archives subsector | Linear metres of storage. |
| Data Centres | kW capacity installed for IT systems [$kW_{IT}$] |
| Higher Education | Occupied hours (typical weekday and weekend during term time, and outside of term time);<br>Number of occupants (average weekday and weekend during term time, and outside of term time). |
| Homes | Number of bedrooms. |
| Homes; flats subsector | Number of storeys;<br>Number of staircases. |
| Hotels | Number of bedrooms;<br>Number of occupied bedroom-nights per year;<br>Conditioned area [$m^2$ NIA]. |
| Offices | Office occupancy type (either: general office; financial; legal; event space; other – please specify);<br>Occupied hours (annual average typical day & weekend, e.g., 8am-6pm, 5 day weeks, no weekend occupancy);<br>Average occupancy density on typical day [number of occupants per $m^2$ NIA, during typical day]. |
| Retail, Supermarket subsector | Area of refrigeration space [$m^2$ NIA];<br>Internal volume of refrigeration units [$m^3$]. |
| Retail, High Street Units & Department Stores' subsector | Type of retail unit (either: general retail (e.g., clothes, pharmacy, general goods etc); department store; dry cleaner; DIY store; hairdresser; nail salon; other beauty parlour retail; high street agency (e.g., bank branch); other – please specify). |
| Retail, Landlord Areas Within Commercial/ Shopping Centres | Landlord area [$m^2$ NIA]. |
| Schools | Number of pupils;<br>Core hours (e.g., typical day e.g., 8am-5pm);<br>Out-of-hours usage [hrs/year]. |

| Sector/subsector | Information to submit |
|---|---|
| Science and Technology | Type of facility(ies) and associated floor area [$m^2$ GIA] (either: teaching lab; general research lab; high demand lab CL3 or above; pharmaceutical R&D; pharmaceutical manufacturing; computational science; other – please specify);<br>Percentage active science/technical area [% of total building floor area GIA];<br>Laboratory gas consumption per year [$m^3$/year] (see also section 5.5);<br>Fume cupboard density [number of fume cupboards per $m^2$ GIA];<br>Total fume cupboard extract rate [$m^3$/hour];<br>Vibration specification [Response Factor, R];<br>Total area of Microbiological Safety Cabinet (MSC) [$m^2$];<br>MSC fumigation strategy (local scavenging, or discharge to atmosphere of fumigant);<br>% of area with a single HEPA filtration on the ventilation to the room;<br>% of area with at least 2 HEPA filters on the ventilation to the room;<br>% of area with at least 3 HEPA filters on the ventilation to the room;<br>% area SAPO2, % area SAPO3, % area SAPO4;<br>% area CL2, % area CL3, % area CL4;<br>Laboratory gases, by type of gas and purity standard;<br>Hours of operation and % of area with 24/7 operation;<br>No. of fume extract arms;<br>No. of autoclaves. |
| Storage and Distribution | Internal building volume [$m^3$]. |

#### 4.2.7.1 Submission to verifier

All assessments and evidence **shall** be submitted to the verifier using the Submission Proforma in Annex B.

Where evidence cannot be submitted via the proforma, this **shall** be submitted in a report when the proforma is submitted.

## 4.3 Claiming conformity with this Standard

Conformity to the Standard requires assessment of a building claim based on measured quantities and actual performance, as opposed to predictive models. As such, claims of conformity can only be assessed and verified for buildings that are complete, occupied and in-use at the time of the assessment (see section 4.2.4).

There are three approaches to claiming conformity:

- Whole-building approach: All mandatory requirements of the Standard are met and verified;
- Landlord-only approach: All mandatory requirements of the Standard are met and verified following Annexes F1 and F2.
- Tenant-only approach: All mandatory requirements of the Standard are met and verified following Annexes F1 and F3.

In conjunction with the above routes, the Claimant may choose to also follow:

- Offsetting: Section 5.10 requirements are also met and verified;
- Other schemes and standards: Annex C requirements are also met and verified.

Section 6 outlines the route to verification for each of the above, and section 7 sets out requirements around communicating all claims of conformity. In particular, section 7.4.2 outlines use of language permitted following full assessment and verification.

Annex E provides a series of verified performance checks that may be undertaken at practical completion, to demonstrate that what has been built should be able to meet the Standard once the building is occupied. This does not permit a claim of conformity to the Standard, however the claimant may then use the language outlined in section 7.4.3 in reference to these checks.

# 5. Assessment, submissions and limits

## 5.1 Embodied carbon

### 5.1.1 Introduction (for information)

This section is provided as guidance for section 5.1.

Each programme of works can be individually assessed, reported and compared to limits, for example with a separate assessment for a programme of New Works or Retrofit Works of an individual building, or different programmes of Reportable Works happening in different parts of the same building or at different points in time.

The Embodied Reporting Period (ERP) is used to define which works are within scope (see section 4.2.4). Once identified, the following is undertaken for each programme of works:

1. Identify whether the item is New Works, Retrofit Works, or Reportable Works (see section 4.2.1);
2. Identify what sector(s) the building/works includes (see section 4.2.1.1);
3. Identify the relevant limit(s) for the works (see Annex A);
4. Undertake a life cycle embodied carbon assessment (section 5.1.2.2), and reuse the data for the other in-scope assessments (sections 5.1.2.3 to 5.1.2.6). Where a building shares external works, basements and foundations with other buildings, pro-rata the embodied carbon (see section 4.2.3);
5. Prepare the relevant embodied carbon submission reporting (see section 5.1.5);
6. Compare against the relevant embodied carbon limits (see section 5.1.6):
    a. This version of the Standard has upfront carbon limits; it is the intention that future versions of the Standard will have whole life carbon, life cycle embodied carbon and upfront carbon limits;
    b. Some sectors have Reportable Works limits that need to be met
    c. Renewable electricity generation systems (e.g., PVs plus secondary support structures) are excluded from scope and have separate limits of their own (see section 5.1.6.4).

It is recommended that assessments and comparison with limits commences from the early design stages, to increase the likelihood of meeting the limits when the final assessment and comparison is undertaken at the end of the ERP.

## 5.1.2 Scope

### 5.1.2.1 Works type scope

For all works other than Non-Reportable Works (section 4.2.1) that achieved Practical Completion during the Embodied Reporting Period (ERP, section 4.2.4), embodied carbon **shall** be assessed, reported and submitted to the verifier.

Programmes of work separated by date and/or floor areas may be individually assessed, reported and checked against limits.

*NOTE 1 The verifier will require evidence that the works are definitely separate/combined to match the way that they have been assessed, reported and submitted. For example, where drawings and timelines indicate that they could have formed one project, but the claimant has assessed them separately, evidence will need to show why they are definitely separate. See section 5.1.5.1.*

In addition to the as-built works, all assessments **shall** include any abortive works, replacement of speculative interior finishes, condemned works and rectification of defects.

Where an off-site renewable electricity generation system is being used to satisfy the requirements of section 5.3, all assessments **shall** include any materials related to that system and its connection to the building.

Where areas of the building are leased, these are covered by the same requirements as all other areas. If the landlord is unable to assess tenant data, Annex F may be used instead of undertaking a whole building assessment.

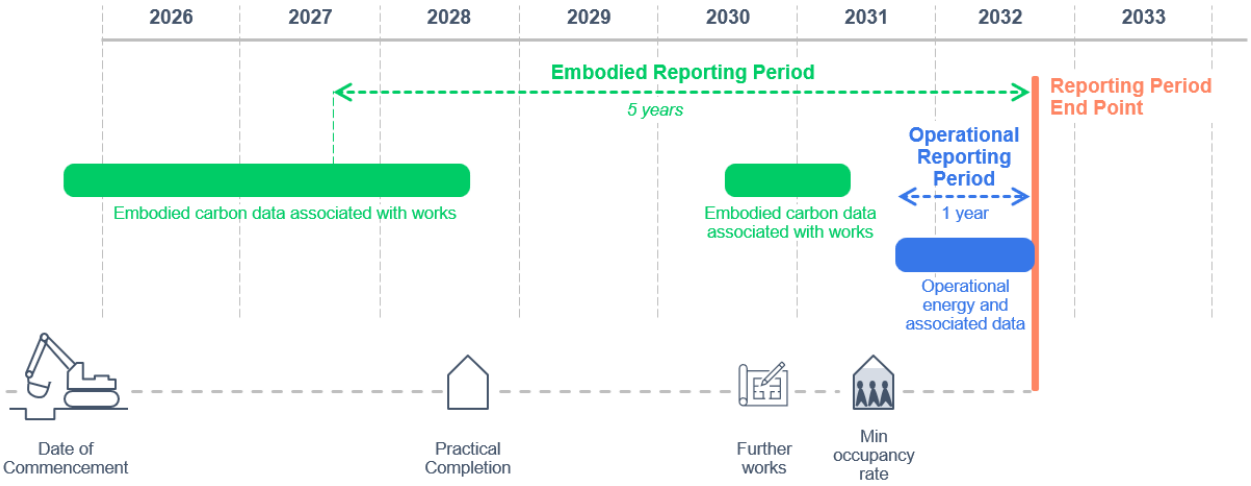



*Figure 6 Examples of multiple works requiring assessment*

*NOTE 2 Achieving the embodied carbon limits is more likely if carbon is assessed and designed for throughout design and construction, starting early.*

*NOTE 3 Only the completion date of the works is relevant to whether the works are included in the assessment, not their start date. If the works are completed during the ERP, all in-scope embodied carbon impacts (from all life cycle stages) are included in the assessment – even if the works commenced years before the ERP start point. It is possible that several separate works, of different types, completed during the ERP, are applicable for inclusion in the assessment.*

#### 5.1.2.2 Life cycle embodied carbon assessment scope – General

A life cycle embodied carbon assessment according to section 5.1.2.1 and the *RICS PS* (particularly, see *RICS PS* sections 4.2 to 4.4) **shall** be undertaken, including modules A0-A5, B1-B5, C1-C4.

The assessment of life cycle embodied carbon **shall** follow *RICS PS* section 5.2.4, and so like-for-like replacement shall be used for modules B2/B3/B4 and module B5 shall be zero.

The scope **shall** include all *RICS PS* building element categories including those associated with any fit-out.

*NOTE 1 Module A0 is likely to be likely to be negligible for most buildings and can be taken as zero where that is the case.*

*NOTE 2 The list and breakdown of building elements to be included in the assessment are shown in the Submission Proforma (see Annex B).*

*NOTE 3 The definition of New Works (see section 4.2.1) is such that it could involve some retention of existing structures. The RICS PS (section 3.3) includes requirements on the embodied carbon assessment of retained structures.*

Where Retrofit Works are undertaken across only part of a building, the GIA measurement related to all embodied carbon assessments should be based only on the parts of the building that the works impact.

*NOTE 4 E.g. If a building has retail units at ground floor level and offices upstairs, and only the retail units are retrofitted, it is best practice to only include the retail floor area in any GIA measurements.*

*NOTE 5 E.g., If a building has the central plant replaced in order to improve the whole building's energy performance, or just a single façade is upgraded for the same reason, it would be allowable to include the whole building's area in the GIA measurement (as a 'whole building retrofit').*

*NOTE 6 Such decisions on areas would be subject to the verifier's review.*

#### 5.1.2.3 Life cycle embodied carbon assessment scope – Reportable Works

Reportable Works **shall** be subject to their own full assessment when clearly not associated with any New Works or Retrofit Works (see section 5.1.2.1).

The scope **shall** follow section 5.1.2.2, subject to the following:

- It **shall** be limited to only the products/materials within the scope of the construction works themselves;
- The first fit-out of a building (including replacement of speculative fit-out) **shall not** be assessed as Reportable Works, as they form part of the New/Retrofit Works scope;
- If the building has changed ownership between the date of Practical Completion of the Reportable Works and the date of the assessment, the Reportable Works that were

completed under the previous owner(s) may be excluded from scope where the embodied carbon data is unavailable.

*NOTE 1 The first bullet above means that products/materials which are already installed within the building do not need to be included in a Reportable Works embodied carbon assessment.*

The GIA that the life cycle embodied carbon is normalised against **shall** only cover the area of floor that the Reportable Works apply to.

For Reportable Works affecting leased areas of the building:

- each tenant's area **shall** be assessed as a separate programme of works;
- works split across multiple tenants, or split between landlord/communal areas and tenanted areas, **shall** be prorated based on the weight of materials in each location;
- works may be ignored where they occur in a single tenant's area that is <500m$^2$ NIA.

*NOTE 2 The 500 m$^2$ NIA threshold is intended to be reduced in future versions of the Standard. it is recommended that all building owners move towards leases that require the reporting of carbon data by all tenants.*

*NOTE 3 Where landlords are unable to assess tenant data, the landlord-only approach may be followed for the whole assessment and verification (see Annex F).*

### 5.1.2.4 Upfront carbon assessment scope – General

The scope **shall** be according to section 5.1.2.2 and the *RICS PS* upfront carbon scope, with the following exclusions:

- Life cycle module A0;
- Toxic/contaminated material treatment (*RICS PS* building element category 0.1.1);
- Pre-construction demolition works (*RICS PS* module A5.1);
- Products/materials within the external works (*RICS PS* building element category 8);
- Products/materials included within the on-site renewable electricity limit scope (see section 5.1.2.7);
- In the Data Centres sector, all building services (*RICS PS* building element category 5)
- In the Science and Technology sector, all heavy lab equipment;
- Products/materials within loose FF&E (within *RICS PS* building element categories 4.4, 4.5 and 4.6) **shall** also be excluded, except:
  - In the Offices sector, where loose FF&E **shall** be included;
  - In the Culture and Entertainment sector, where the following **shall** be included:
    - Performance seating;
    - Stage extensions or alternative stage formats stored on site;
    - Tension wire grids, winches, bars and flying systems;
    - Integrated performance equipment, including cinema screens, speakers, AV/sound/lighting infrastructure and dimmer racks;
    - Shelving and racking in archive areas.

*NOTE 1 Biogenic carbon sequestered in the installed products/materials at practical completion is excluded, following the RICS PS.*

*NOTE 2 For details of RICS PS building element categories, see RICS PS Supporting Document, Building Element Categories Spreadsheet.*

*NOTE 3 Culture and Entertainment inclusions are highlighted above because they are often considered loose FF&E. Other loose FF&E is still excluded in that sector.*

Where >50% of the NIA is classified as Offices sector (see section 4.2.1.1), Shell and Core, Cat A and Cat B upfront carbon **shall** also individually be assessed. The scope of the assessments **shall** follow the requirements of the rest of this section, but limited to the products/materials given in the definitions in sections 3.1.4.13, 3.1.4.14 and 3.1.4.15, shown indicatively in the figure below.

*NOTE 4 E.g., for the Shell and Core (S&C) assessment, the scope would exclude products/materials not within the S&C scope, and so on.*

*NOTE 5 The S&C, Cat A and Cat B do not require new assessments, they can use a filtered set of the whole building upfront carbon assessment results (section 5.1.2.4). These are for reporting and submission purposes only and do not need to be compared to limits.*

*NOTE 6 As better data becomes available, further sectors may be added to this requirement.*

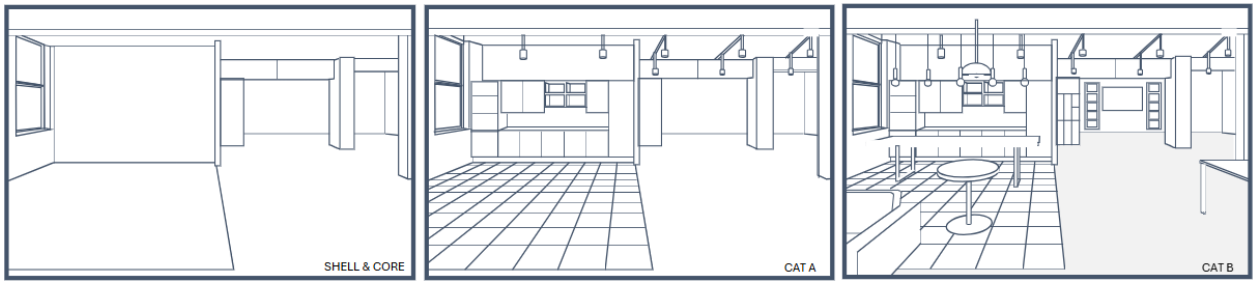



*Figure 7 Indicative scopes for Shell & Core, Cat A and Cat B*

### 5.1.2.5 Upfront carbon assessment scope – Reportable Works

The scope **shall** be according to section 5.1.2.3 and the *RICS PS* upfront carbon scope, plus the bullet point list of exclusions in section 5.1.2.4.

### 5.1.2.6 Upfront carbon assessment scope – generic material specifications

An additional upfront carbon assessment **shall** be completed, that is identical to all upfront carbon assessments that have been undertaken (see sections 5.1.2.4 and 5.1.2.5), but replacing A1-A3 carbon factors with the recommended default values given in *IStructE How to Calculate Embodied Carbon* for the following materials:

- All structural concrete products/materials**;**
- All structural steel products/materials, including reinforcement and secondary structure;
- All façade aluminium and structural aluminium products/materials**.**

The results **shall not** be compared with limits.

*NOTE 1 In version 3 of IStructE How to Calculate Embodied Carbon, these are given in Table 2.5. The guide is free to download in PDF form (a free account must be created).*

*NOTE 2 This applies to all assessments undertaken, whether for New Works, Retrofit Works, or Reportable Works. The only exception would be for works that have not used any of the materials listed in the bullet points above.*

*NOTE 3 This additional assessment takes place to identify the extent to which meeting the upfront carbon limits was dependent on the use of lower carbon material specifications. Submission of quantities (section 5.1.5.8) to the verifier will also inform this.*

*NOTE 4 Only Modules A1-A5 are required to be assessed and submitted. Whilst using different A1-A3 carbon factors would typically also affect the embodied carbon figures within Modules B, C and D of a WLCA, the purpose of this assessment is to aid a better understanding of how upfront carbon assessment results are affected by carbon emission factors specific to different concrete mixes and steel/aluminium recycled content levels.*

*NOTE 5 This includes the same scope of works as the general upfront carbon assessment, so extends to the level of detail of fixed Fixtures, Fittings and Equipment (FF&E).*

### 5.1.2.7 Upfront carbon assessment scope – on-site renewable electricity generation

An additional upfront carbon assessment **shall** be completed for all renewable electricity generation systems assessed under the scope of section 5.3.1.2, including photovoltaics, wind turbines and hydroelectric turbines.

Other products/materials, with functions only relating to the above systems, may be included in this scope (e.g., secondary framework installed only to support the additional weight imposed by photovoltaic cells, or materials related to off-site renewables where they are used to satisfy the requirements of section 5.3).

The scope of the comparison per system **shall** be according to section 5.1.2.1 and the *RICS PS* upfront carbon scope, with the following exclusions:

- Life cycle module A0;
- Products/materials that are not part of the on-site renewable electricity generation system;
- Products/materials not within the scope of the construction works;
- Batteries.

*NOTE 1 All items included within this scope are removed from the scope of all other upfront carbon assessments (see section 5.1.2.4). This avoids double counting, as all materials will be included either in the renewables scope or the whole-building scope. Products/materials that are in-scope for the renewables systems will therefore be compared to the upfront carbon limits for renewables (see section 5.1.6.4), but not the whole building limits (see section 5.1.6.1).*

*NOTE 2 It is anticipated that this assessment can use the results from the whole building upfront carbon assessment (section 5.1.2.4), filtered to the scope shown above.*

## 5.1.3 Metrics

The metrics for assessment, reporting and comparison with limits **shall** be according to Table 8.

If relevant to the sector, optional metrics (e.g., upfront or life cycle embodied carbon per $m^2$ NIA, per desk, per pupil, or per bed) may be reported in addition to those given in Table 8.

*Table 8 Metrics – embodied carbon*

| Sector/aspect | Pass/fail metric(s) name and unit | Reporting metric(s) name and unit |
|---|---|---|
| All except shown below | Upfront carbon [$kgCO_2e/m^2$ GIA] (see sections 5.1.2.4 and 5.1.6.1) | Life cycle embodied carbon [$kgCO2e/m^2$ GIA] (see section 5.1.2.2 and 5.1.2.3)<br>Upfront carbon, Reportable Works [$kgCO2e/m^2$ GIA] (see section 5.1.2.5)<br>Upfront carbon, generic material specifications [$kgCO2e/m^2$ GIA], [kg] (see section 5.1.2.6) |
| Where the majority of the floor area of the building is Offices sector | Upfront carbon [$kgCO_2e/m^2$ GIA] (see sections 5.1.2.4 and 5.1.6.1)<br>Upfront carbon, Reportable Works [$kgCO_2e/m^2$ GIA] (see sections 5.1.2.5 and 5.1.6.1) | Life cycle embodied carbon [$kgCO_2e/m^2$ GIA] (see section 5.1.2.2 and 5.1.2.3)<br>Upfront carbon, generic material specifications [$kgCO_2e/m^2$ GIA], [kg] (see section 5.1.2.6)<br>Upfront carbon, Cat A only [$kgCO_2e/m^2$ GIA] (see section 5.1.2.4)<br>Upfront carbon, Cat B only [$kgCO_2e/m^2$ GIA] (see section 5.1.2.4) |
| Where the majority of the floor area of the building is Storage and Distribution sector | Upfront carbon [$kgCO_2e/m^2$ GIA] (see sections 5.1.2.4 and 5.1.6.1) | Life cycle embodied carbon [$kgCO_2e/m^2$ GIA] (see sections 5.1.2.2 and 5.1.2.3)<br>Life cycle embodied carbon per $m^3$ internal building volume[a] [$kgCO_2e/m^3$ of internal building volume] (see section 5.1.2.2 and 5.1.2.3)<br>Upfront carbon, Reportable Works [$kgCO_2e/m^2$ GIA] (see section 5.1.2.5)<br>Upfront carbon per $m^3$ internal building volume[a] [$kgCO_2e/m^3$ of internal building volume] (see sections 5.1.2.4)<br>Upfront carbon, generic material specifications [$kgCO_2e/m^2$ GIA], [kg] (see section 5.1.2.6) |

| Sector/aspect | Pass/fail metric(s) name and unit | Reporting metric(s) name and unit |
|---|---|---|
| All floor areas defined as Data Centres | Upfront carbon [kg$CO_2$e/m$^2$ GIA] (see sections 5.1.2.4 and 5.1.6.1) | Life cycle embodied carbon [kgCO2e/m$^2$ GIA] (see section 5.1.2.2 and 5.1.2.3)<br>Upfront carbon, Reportable Works [kgCO2e/m$^2$ GIA] (see section 5.1.2.5)<br>Upfront carbon, generic material specifications [kgCO2e/m$^2$ GIA], [kg] (see section 5.1.2.6)<br>Upfront carbon emissions per kWh of IT energy use [kgCO2e/kWh of IT energy use] |
| On-site renewable electricity generating equipment | Photovoltaics only: Upfront carbon per peak power output [kg$CO_2$e/kWp] (see sections 5.1.2.7 and 5.1.6.4) | Photovoltaics only: Peak power [kWp]<br>Wind turbines and hydroelectric only: Reference power [kW] |

[a] When reporting carbon per m$^3$ for Mixed-Use buildings, the scope for both carbon and volume are limited to only those spaces where the floor area has been defined as Storage and Distribution.

### 5.1.4 Assessment methodology

The assessment methodology **shall** be according to the *RICS PS*, with the variations and amplifications set out in this section.

The assessment **shall** account for the *RICS PS* 'WLCA uncertainty factor' (see section 4.10 of the *RICS PS*), noting that this is added at the end after the total embodied carbon is assessed in each lifecycle module.

*NOTE Most of the requirements in this section follow a hierarchical approach, prioritising the highest quality data (e.g., product-specific EPDs, as-delivered material quantities) but allowing relaxations where this is not available.*

#### 5.1.4.1 Material quantity information

Quantity information **shall** be according to the sources listed for 'Post-completion phase – actual quantities' in *RICS PS* Table 6. If these sources do not include information at the necessary level of detail for a specific item, other project sources or reasonable assumptions may be used for that item.

If the source type 'As-built cost record of material quantities procured' for the works includes quantity information for a specific item, then this source should be used for that item. If the quantity value in this source is an aggregation of the quantity installed (relating to modules A1-A3) and the quantity wasted on site (relating to module A5.3), then a reasonable method for

allocating the aggregated quantity between A1-A3 and A5.3 **shall** be used and explained in the assessment report.

#### 5.1.4.2 Product/material lifespan

For each product/material, the lifespan **shall** be based on *RICS PS* Table 20, unless more appropriate information is available, in which case that **shall** be used instead.

#### 5.1.4.3 Carbon data sources – products/materials and systems

The carbon data used for construction products/materials and systems for life cycle module A1-A3 **shall** be according to the flowchart provided in Figure 8.

Use of the term 'product' in Figure 8 also refers to materials and systems.

If the EPD/dataset does not address processing stages undertaken between the modelled factory gate and the construction site (e.g. fabrication of reinforcement cages), the impacts of these additional processes and any relevant transport **shall** be added to the A1-A3 factor used.

Environmental product declarations (EPD), used for construction products, **shall** be independently verified according to *ISO 14025*, and use *EN 15804* or *ISO 21930* as the core product category rules.

EPD, used for electronic and electrical products and systems, **shall** be independently verified according to *ISO 14025*, and use *EN 15804*, or *EN 50693*, *EN IEC 63366* and *EN 15804*, as the core product category rules.

*NOTE 1 Several, numbered, requirements referenced from the figure are listed on the page after the figure.*

*NOTE 2 The labelling of the endpoints of the figure (e.g., BOX 1) are for use in the submission proforma (see Annex B)*

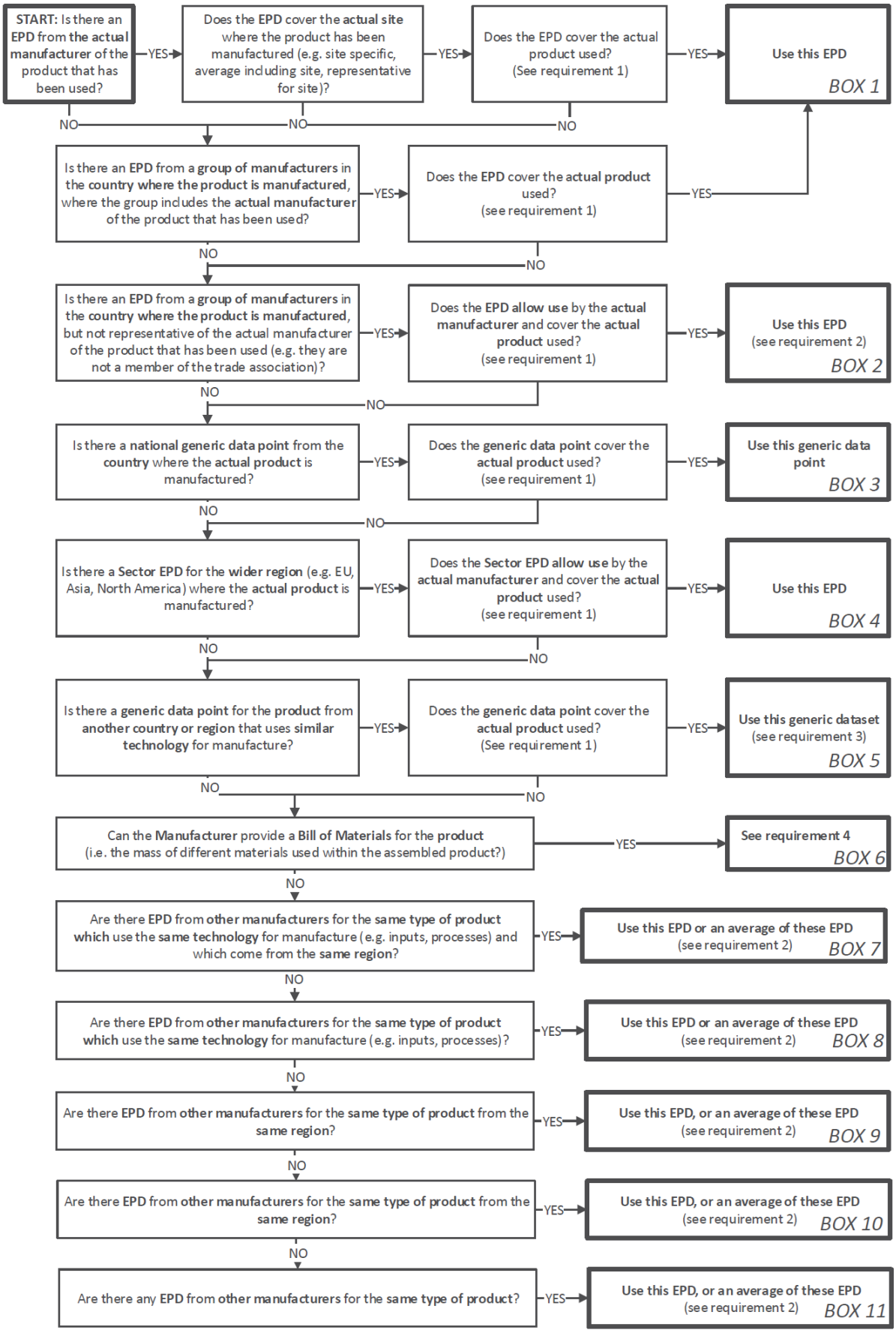



*Figure 8 Carbon data selection flowchart, products/materials/systems life cycle module A1-A3*

Requirements in Figure 8:

1. An EPD **shall** be considered to cover the actual product if it is for the specific product type, or it is a representative, average or worst case EPD for a product group which includes the actual product;
2. For the calculation of the carbon data uncertainty factor, if the EPD is for a key product (see section 4.10 of the *RICS PS*) then the EPD shall be considered as a proxy EPD for this product, as the actual manufacturer is not covered by the EPD;
3. Different geography may mean significant difference in impact;
4. In the case of MEP products, either Product Carbon Footprints (PCFs, see below) or the following calculations **shall** be used:
    a. For any items costing >1% of the cost of the building, the 'Mid-level Calculation' in *CIBSE TM65*;
    b. For other items, the 'Basic Calculation' in *CIBSE TM65*.

    In the case of non-MEP products (whether facades or not), either PCFs (see below) or the following approaches **shall** be used:
    c. For any items costing >1% of the cost of the building, the 'Full Approach' in the *CWCT Methodology*;
    d. For other items, the 'Simplified Approach' in the *CWCT Methodology*.

    PCFs to either *ISO 14067* or *PAS 2050* may be used instead of the above, with preference given to verified or peer reviewed studies using *EN 15804* or *ISO 21930* as the footprint product category rules in addition to *BS EN ISO 14067* or *PAS 2050*.

#### 5.1.4.4 Offsetting and insetting

Embodied carbon assessments **shall not** consider offsetting or insetting within the use of carbon factors (e.g., A1-A3 factors). Embodied carbon assessments may use EPD which use the location-based approach using the consumption mix, or the market-based approach using residual mix or contractual instruments (i.e. Guarantee of Origin) for electricity and gas according to the requirements in Annex E of *EN 15941*.

#### 5.1.4.5 Transport to site scenarios

Where known, transport to site (life cycle module A4, see *RICS PS* section 4.6.3) **shall** be modelled based on the actual quantities used, the actual distance from the supplier, vehicle loading, number of journeys, empty return and fuel consumption data.

Where this is not known, emissions **shall** be based on assumptions considered reasonable based on current information. If a previous assessment was undertaken during an earlier design stage, then the transport to site (A4) assumptions therein may be used, if reviewed and still considered reasonable based on current information.

### 5.1.5 Submission requirements

Information submitted to the verifier **shall** be according to the *RICS PS*, with the following variations and amplifications.

#### 5.1.5.1 Life cycle embodied carbon submissions

Submissions to the verifier **shall** include all the items described in *RICS PS* section 6.1.1, which have been listed in the Submission Proforma (see Annex B).

Where the claimant is submitting more than one assessment across separate programmes of works, they **shall** submit drawings, timelines, building contracts, and anything else required for the verifier to confirm the works were separate.

Submissions to the verifier **shall** include both decarbonised and non-decarbonised scenarios as described in *RICS PS* section 4.11.5.

#### 5.1.5.2 Buildings containing existing and new floor areas

If the building includes both new and existing floor areas (see sections 3.1.4.10 and 3.1.4.11), then the total upfront carbon and total life cycle embodied carbon for all works types **shall** also be submitted to the verifier separately from each other. These totals **shall** omit any carbon reported under the *RICS PS* building element category 8 (external works).

If specific aspects cannot reasonably be assessed separately (e.g., aspects within life cycle module A5), then the impact of those aspects **shall** be reported pro-rata based on NIA of new and existing floor areas.

*NOTE 1 This is for reporting purposes only, to enable a better understanding of the embodied carbon emissions related to extensions versus retained buildings. Comparison to limits still occur at the whole -building level.*

*NOTE 2 Breakdown within modules is not required, only the A1-A5 total and A-C total. Breakdown within the RICS PS building element categories is required per the main submission, except external works which are not submitted here.*

#### 5.1.5.3 Key products/materials

In addition to the key material/product mandatory reporting requirements of the *RICS PS* (section 6.1.1, Assessment Information, item 8), key product/material information **shall** be reported according to the requirements of the Submission Proforma (see Annex B).

#### 5.1.5.4 Product/material lifespan

If a product/material is modelled with a lifespan different to that in Table 20 of the *RICS PS* (see section 5.1.4.2 of this Standard) then the reporting **shall** include:

- The product/material manufacturer and reference;
- The lifespan modelled;
- Justification of why the lifespan is different to that provided in Table 20 of the *RICS PS*, based on the requirements and information provided in section 5.2.4 of the *RICS PS*.

### 5.1.5.5 Works to retained products/materials and elements

If the assessment includes works to retained products/materials and elements (see *RICS PS* section 6.1.2, item 3) then the reporting **shall** include a description of the scope of these works to these products/materials and elements.

### 5.1.5.6 On-site renewable electricity generating equipment

For the products/materials within the on-site renewable electricity generating equipment scope (see section 5.1.2.7), the following **shall** be submitted separately from the other building elements included in the assessment:

- Upfront carbon (modules A1-A5) emissions;
- Life cycle embodied carbon (modules A-C) emissions;
- Peak power output (kWp) for photovoltaics;
- Reference power (kW) for hydroelectric turbines and wind turbines.

### 5.1.5.7 Upfront carbon assessment – generic material specifications

The additional upfront carbon assessment evidence and submission requirements **shall** be reported separately from the main assessment. The submission requirements are identical to the main assessment except that only the results affected by the use of generic material specifications according to section 5.1.2.6 **shall** be submitted.

*NOTE 1 For this additional upfront carbon assessment, any emissions not affected by using generic carbon factors do not need to be submitted.*

*NOTE 2 It is expected that as a minimum, the submission would include any RICS PS building element categories that contain structural concrete, steel or aluminium, and as a minimum would include figures for the A1-A3 module, and the A1-A5 and A-C totals.*

### 5.1.5.8 Material quantities – generic material specifications

To support the data submitted according to section 5.1.5.7, material quantities **shall** be summed and submitted for all material grades and types assessed according to section 5.1.2.6.

*NOTE 1 E.g. if three different concrete grades and two types of steel were assessed under section 5.1.2.6, then each of those five materials need their total material quantities summing and submitting.*

*NOTE 2 The list of material quantities in section 5.1.2.6 is intended to be extended in future versions of the Standard, and the tracking of materials quantities throughout design development is encouraged.*

## 5.1.6 Limits

For works that commenced after the publication of Version 1 of this Standard (see section 4.1.2) and completed during the Embodied Reporting Period (ERP), sections 5.1.6.1 to 5.1.6.4 **shall** be followed.

The limits used for each works **shall** be based on the Date of Commencement (see section 4.2.6) of those works.

*NOTE For works that commenced prior to the date of publication of Version 1 of this Standard, but still completed within the ERP, assessment and submission to the verifier is still required, but no comparison with the limits is needed.*

### 5.1.6.1 Upfront carbon limits – General

Where 'whole building' limits in Tables EC-1 and EC-2 (see Annex A) for the works type and sector (see sections 4.2.1 and 4.2.2), those limits **shall not** be exceeded.

The scope of assessment checked against the limits **shall** be according to section 5.1.2.4.

Where different programmes of works have had their assessments combined (see section 5.1.2.1), the highest limit across the works may be used, and the area against which the emissions are normalised for comparison may include all areas where works have occurred.

The assessed scope **shall** be according to section 5.1.2.4.

### 5.1.6.2 Upfront carbon limits – Reportable Works

If one or more upfront carbon limits are available in Table EC-3 (see Annex A) for the applicable sector (see section 4.2.2) and scope below, those limits **shall not** be exceeded:

- If upfront carbon emissions due to Cat B works (see section 3.1.4.15) are more than 80% of the total in-scope upfront carbon:
  - The scope of assessment checked against the limits **shall** be according to section 5.1.2.5 but excluding Shell and Core and Cat A, and
  - The Cat B limits **shall** be used;
- Else:
  - The scope of assessment checked against the limits **shall** be according to section 5.1.2.5, and
  - The Cat A + B limits **shall** be used.

#### 5.1.6.3 Life cycle embodied carbon limits

If one or more life cycle embodied carbon limits are available in Table EC-4 (see Annex A) for the works type and sector (see sections 4.2.1 and 4.2.2), those limits **shall not** be exceeded.

The scope of assessment checked against the limits **shall** be according to section 5.1.2.2.

*NOTE In this version of the Standard, there are no life cycle embodied carbon limits, however these are intended to be included in a future version of the Standard.*

#### 5.1.6.4 Upfront carbon limits – on-site renewable electricity generation

If the works include the installation of new on-site renewable electricity generation equipment, then where limits are available in Table EC-5 (see Annex A), those limits **shall not** be exceeded.

The scope of assessment checked against the limits **shall** be according to section 5.1.2.7.

*NOTE 1 Existing systems that are reused do not need to meet the limits in Annex A.*

*NOTE 2 Even when no limits are present in Annex A, the upfront carbon assessment and submission to the verifier is still required (see sections 5.1.3 and 5.1.4).*

# 5.2 Operational energy

## 5.2.1 Scope

### 5.2.1.1 Building type scope

For all building types (see section 4.2.1), operational energy **shall** be measured, assessed, reported, and submitted to the verifier.

### 5.2.1.2 Operational energy assessment scope – general

The scope of operational energy assessment **shall** include all energy used by the building, from all supplies, including renewable electricity or heat generated on site (see section 5.3.1.2), except for the following exclusions:

- Manufacturing, production, waste treatment or other industrial processes;
- Energy used by external works (*RICS PS* building element category 8, see *RICS PS Supporting Document*) including street lighting and service yards.

For Mixed-Used buildings, submetering **shall** be used to allow the assessment of energy used by different sectors and subsectors within the building (see also section 5.2.2).

Energy use in car parks (including electric vehicle charging):

- **Shall** be submetered in New Buildings or where the car park is part of a New Area (see section 3.1.4.10);
- Should be submetered in Existing Buildings or where the car park is part of an Existing Area (see section 3.1.4.11).

*NOTE 1 'Industrial process' refers to chemical, physical, electrical, or mechanical processes during the production or manufacture or products and could arise in buildings such as warehouses, labs, and educational buildings etc. This energy may be utilised for activities such as heating, cooling, mechanical work, chemical reactions, and other operations essential to the transformation of raw materials into finished products or goods. Cold storage is not considered an industrial process. This does not cover space heating and cooling to the spaces where the process is occurring.*

*NOTE 2 As highlighted above, the scope of operational energy assessment shall include energy from all supplies including renewable electricity or heat generated on site - e.g., if a building annually uses 90,000kWh electricity supplied by the grid, 10,000 kWh supplied by an on-site solar thermal system, and 30,000 kWh electricity supplied by on-site PVs, then its total energy use is 130,000 kWh per year.*

*NOTE 3 Car park requirements apply for all external and internal car parks.*

### 5.2.1.3 Additional Uses

The areas and uses within buildings shown in Table 9 may be classified as Additional Uses (see section 3.1.4.12) for up to 30% of the NIA of the building, provided that those areas and uses are submetered to allow separate measurement and reporting of energy use. The energy used by Additional Uses **shall** be assessed but is not required to meet limits (see section 5.2.7).

*NOTE 1 Classifying areas as Additional Uses does not change the sector classification of the building (see section 4.2.1.1).*

*NOTE 2 Additional Uses typically have a non-negligible impact on a building's energy use, but no data currently exists for which a limit could be set. As such, they are assessed, reported and submitted separately to the rest of the building, and have no energy use intensity limits.*

*Table 9 Additional Uses*

| **Sector** | **Facilities and activities that may be classified as Additional Uses when submetered:** |
|---|---|
| Commercial Residential | Laundry. |
| Culture & Entertainment, Performance subsector | Theatre production workshops. |
| Hotels | Laundry. |
| Retail; Landlord areas subsector within commercial centres/shopping centres | Waste storage & management areas (even if internal). |
| Schools | Community uses and other out-of-hours use;<br>Large specialist uses (e.g., craft, design and technology equipment; multiple kilns, etc.). |
| Science and Technology | Equipment with safety critical function (e.g., effluent treatment plant, microbiological safety cabinets);<br>Higher performance laboratory spaces above Hazard Group Level 2 or similar specialist applications, manufacturing facilities, or those with more onerous vibration criteria of R<1 (e.g., close control labs for specialist prep and experiments with temperature control ranges of +/-1°C and humidity control ranges of +/-5%RH; or CERs which need to operate 24/7 and meet the same control requirements);<br>Close control spaces in bioimaging specialist prep and SB CTR;<br>High process loads in labs (e.g. laser, fibre optic), if the load is above 200W/$m^2$. |
| Sport and Leisure | Community uses (e.g., “warm spaces”). |

### 5.2.2 Metrics

The metrics for assessment, reporting, and for comparison with limits **shall** be according to Table 10. For mixed-use buildings, any relevant reporting metrics that are sector-specific **shall** be measured and assessed using data associated only with the areas of the building associated with the relevant sector.

*Table 10 Metrics – operational energy*

| Sector | Subsector | Pass/fail metric(s) name and unit[a] | Reporting metric(s) name and unit |
|---|---|---|---|
| All sectors unless listed below | All subsectors | Energy use intensity (EUI) per $m^2$ GIA per year [kWh/$m^2$ GIA/year] | Annual operational carbon emissions intensity per $m^2$ GIA per year [kg$CO_2$e/$m^2$ GIA/year] |
| Data Centres | All subsectors | Power Usage Effectiveness, annualised (PUE) | Energy use intensity (EUI) per $m^2$ GIA per year [kWh/$m^2$ GIA/year]<br>Annual operational carbon emissions intensity per $m^2$ GIA per year [kg$CO_2$e/$m^2$ GIA/year]<br>Annual operational carbon emissions per kWh of IT energy use [kg$CO_2$e/kWh of IT energy use]<br>Carbon Use Effectiveness (CUE) [CUE] |
| Healthcare | All subsectors | Energy use intensity (EUI) per $m^2$ GIA per year [kWh/$m^2$ GIA/year] in accordance with the *NHS NZBS*, including clauses relating to domestic hot water and unregulated loads (advisory in *NHS NZBS* but mandatory in the Standard, see section 5.2.7.1) | Annual operational carbon emissions intensity per $m^2$ GIA per year [kg$CO_2$e/$m^2$ GIA/year]<br>Energy use intensity (EUI) per $m^2$ GIA per year [kWh/$m^2$ GIA/year], per space type as defined by *NHS NZBS*<br>Energy use intensity (EUI) for Domestic Hot Water per $m^2$ GIA per year [kWh/$m^2$ GIA/year]<br>Energy use intensity (EUI) for unregulated loads per $m^2$ GIA per year [kWh/$m^2$ GIA/year] |
| Hotels | All subsectors | Energy use intensity (EUI) per $m^2$ GIA per year [kWh/$m^2$ GIA/year] | Annual operational carbon emissions intensity per $m^2$ GIA [kg$CO_2$e/$m^2$ GIA/year]<br>Energy use per $m^2$ conditioned area per year [kWh/$m^2$ CA/year] |

| Sector | Subsector | Pass/fail metric(s) name and unit[a] | Reporting metric(s) name and unit |
|---|---|---|---|
| | | | Energy use per bedroom per year [kWh/bedroom/yr] |
| Offices | All subsectors | *Either* Energy use intensity (EUI) per $m^2$ NIA [kWh/$m^2$ NIA/year]<br>*or* energy use intensity (EUI) per $m^2$ GIA [kWh/$m^2$ GIA/year] | Annual operational carbon emissions intensity per $m^2$ NIA per year [$kgCO_2e/m^2$ NIA/year]<br>Annual operational carbon emissions intensity per $m^2$ GIA per year [$kgCO_2e/m^2$ GIA/year] |
| Retail | All subsectors not shown below | Energy use intensity (EUI) per $m^2$ GIA per year [kWh/$m^2$ GIA/year] | Annual operational carbon emissions intensity per $m^2$ GIA [$kgCO_2e/m^2$ GIA/year] |
| | Landlord Areas Within Commercial/ Shopping Centres | Energy use intensity (EUI) per $m^2$ GIA per year [kWh/$m^2$ GIA/year] | Annual operational carbon emissions intensity per $m^2$ GIA [$kgCO_2e/m^2$ GIA/year]<br>Energy use per $m^2$ common parts area [kWh/$m^2$CPA/year] |

[a] Where Additional Uses (see section 5.2.1.3) have been identified, pass/fail metrics are treated as reporting metrics for those areas (i.e. no limits/targets apply).

## 5.2.3 Measurement and assessment methodology

### 5.2.3.1 Operational energy use measurement

Energy use **shall** be measured according to Table 11, in kWh.

For buildings connected to district heating/cooling networks (DHCNs) and/or combined heat and power systems (CHPs), operational energy use **shall** include energy used by the network for generation and distribution of heat/coolth, allocated to the building in proportion to the heat/coolth delivered to the building during the Operational Reporting Period (ORP, see section 4.2.4.2).

*Table 11 Measurement – operational energy*

| Energy type | Use measurement approach |
|---|---|
| Grid supplied electricity | Meter readings |
| Grid supplied natural gas[a] | Meter readings |
| District network supplied thermal energy | Meter readings accounting for the energy used to generate and distribute the heat/coolth |

| Energy type | Use measurement approach |
|---|---|
| Bulk supplied fuels (e.g., oil, coal, LPG, biofuels)[a] | Based on annual stock measurements and deliveries |
| Renewable electricity generation used by the building | Meter readings[b] (see section 5.3.2) |
| Renewable heat (solar thermal and geothermal) generation | Meter readings |
| District heating and/or cooling systems (DHCN) | Heat meter readings, used to allocate the energy used by the network to generate and distribute heat/coolth to the building – refer to section 5.2.3.6 regarding calculation methodology for the carbon content of heat, and the energy used for heat/coolth generation and distribution, and its allocation to the building. |
| Combined heat and power (CHP) | Heat and/or electricity meter readings, used to allocate the energy used by the CHP plant to the heat/coolth and/or electricity to the building. |

[a] Refer to section 5.5 for restrictions and exclusions relating to fossil fuel use on site

[b] Renewable electricity generation used by the building may be measured by taking the difference between the total renewable electricity generated, and the amount that is exported.

*NOTE Energy use measurement for deriving the EUI includes all electricity supplied, including that which is generated on-site by renewable electricity systems. Section 5.3 provides requirements for measuring electricity generated on-site.*

Mixed-Use buildings including areas classified as Data Centres **shall** use submeters to separately measure all energy used by the Data Centre in a way that allows calculation of the Power Usage Effectiveness (PUE, the ratio of total building energy use to IT equipment energy use).

### 5.2.3.2 Carbon assessment for operational energy

The carbon emissions from all energy sources included in the operational energy scope (see section 5.2.1.2) **shall** be calculated and reported.

The reporting is based on annual reporting carbon conversion factors (set 3 in the *RICS PS*), with the following exclusions:

- Upstream emissions from embodied carbon in infrastructure used to extract, create, process, distribute and store energy.

The scope of carbon emissions **shall**, as a minimum, include the following:

- Direct greenhouse gas emissions (*GHG Protocol* Scope 1);

- Indirect greenhouse gas emissions from electricity and district heating/cooling (*GHG Protocol* Scope 2);
- Well to tank emissions from energy used during the fuel production process (*GHG Protocol* Scope 3);
- Well to tank emissions associated with transmission and distribution losses (*GHG Protocol* Scope 3).

Operational carbon emissions **shall** be calculated by multiplying the energy used during the assessment period by the carbon emissions factors specified in the following sections:

- For fossil fuels, biofuels and energy from waste, section 5.2.3.3;
- For UK grid supply electricity, section 5.2.3.4
- For on-site electricity use, section 5.2.3.5;
- For district heating and cooling, section 5.2.3.6;
- For combined heat and power, section 5.2.3.7.

In all cases, the most recently available data available at the Reporting Period End Point (RPEP, see section 4.2.4.1) **shall** be used.

### 5.2.3.3 Carbon emission factors for fossil fuels, biofuels and energy from waste heat

For the calculation of carbon emissions from fossil fuels and biofuels, the emission factors in this section **shall** be used.

Where the building uses a fuel type that is not provided by the sources listed in this section, an emission factor that aligns with the scope outlined in section 5.2.3.2 **shall** be used.

*NOTE 1 The carbon emissions from fossil and biofuels that are used on-site as part of allowed exceptions under the fossil fuel free requirement must still be reported.*

**Fossil fuels**

For fossil fuel emission factors, use the following factors from the *UK Government Conversion Factors Full Set*:

- For fossil fuels, use the factors for “Fuels”;
- For well to tank (WTT) emissions from fossil fuels, use the factors for “WTT- fuels”.

See section 5.5 for requirements around use of fossil fuels.

**Biofuels**

For biofuel emission factors, use either:

- Life cycle carbon factors (including WTT) from a scheme approved under the EU Renewable Energy Directive; or

- The following factors from the *UK Government Conversion Factors Full Set*:
  - For biofuels, use the factors for “Bioenergy”;
  - For WTT emissions from biofuels, use the factors for “WTT- bioenergy”.

See section 5.5 for requirements around use of biofuels.

**Energy from waste**

When calculating the carbon emissions factors from heat produced by waste incineration (Energy from Waste), the carbon emission factor for waste **shall** be from *UK Energy from Waste Statistics*, using the average fossil $CO_2$ emitted per tonne.

*NOTE 1 In the 2024 report the value for average fossil $CO_2$ per tonne can be found on page 10, figure 19.*

Thermal energy from waste incineration (‘energy from waste’) factors shall use the following annual figures from the heat supplier, and the calculation methodology in section 5.2.3.7:

- Waste input to the incineration plant,
- Heat and electricity supplied by the plant.

Where this value isn't available from the heat supplier, an average UK value should be used.

**Energy from waste heat**

Thermal energy from waste heat (e.g., from data centres or industrial processes) **shall** be assigned an emission factor of zero. Energy used to distribute that heat prior to entering the building **shall** be included as specified in section 5.2.3.7.

### 5.2.3.4 Carbon emission factors for UK grid supply electricity

For the calculation of annual carbon emissions from UK grid supply electricity, the following factors from the *UK Government Conversion Factors Full Set* **shall** be used:

- Electricity generation – “Electricity generated: Electricity UK”
- Transmission and distribution losses – “T&D- UK electricity”
- Well to tank emissions for UK electricity generation - “WTT- UK electricity (generation)”
- Well to tank emissions for Transmission and distribution losses – “WTT- UK electricity (T&D)”

Where time of use electricity consumption data is available (e.g., hourly) national time of use carbon emission factors may be used in place of the annual values, provided:

- The measurement data and emissions factors match in terms of both the period covered and the measurement intervals,
- Transmission and distribution losses and well-to-tank emissions for transmission and distribution losses are to be included, and
- They are declared in the assessment report, including the source and methodology.

*NOTE 1 The National Grid carbon intensity dashboard provides historic hourly data on the carbon intensity of UK electricity generation only, therefore annual transmission and distribution losses ("T&D – UK electricity") and well to tank emissions for transmission and distribution losses ("WTT-UK electricity (T&D)") for grid supply electricity will need to be added to calculate carbon impacts in accordance with section 5.2.3.2.*

*NOTE 2 Supplier-specific and grid-specific emission factors associated with Renewable Energy Guarantees of Origin certificates (REGOs) are not to be used for UK grid supply electricity for carbon reporting.*

### 5.2.3.5 Carbon emission factors for renewable electricity generated on-site

Renewable electricity generated and used on-site **shall** be assigned an emission factor of zero.

Where module D is reported as part of the Whole Life Carbon Assessment, renewable electricity generated on-site and exported to the grid **shall** use the grid supply electricity factors in section 5.2.3.4 to calculate the carbon emission benefits.

### 5.2.3.6 Energy used and carbon emission factors for district heating and cooling

The energy used for district heating or cooling that is imported into the building ($EU_{DH,DC}$) **shall** be calculated according to Equation 2a.

*Equation 2a Energy use for district heating or cooling*

$$EU_{DH,DC} = (kWh_{generation} + kWh_{distribution}) \times (kWh_{metered} / kWh_{system})$$

Where:

- $EU_{DH,DC}$ = Annual energy used for heat/cooling in building (kWh).
- $kWh_{generation}$ = Total annual energy from all sources used to generate heating/cooling.
- $kWh_{distribution}$ = Total annual energy from all sources used to distribute heating/cooling.
- $kWh_{metered}$ = Annual heating/cooling measured at the point of connection to the building.
- $kWh_{system}$ = Total annual heating/cooling delivered by the district heating and cooling network.

The carbon emission factor for district heating or cooling that is imported into the building ($EF_{DH,DC}$) **shall** be calculated according to Equation 2b.

*Equation 2b Carbon emission factor for district heating or cooling*

$$EF_{DH,DC} = (kgCO_2e_{generation} + kgCO_2e_{distribution}) / kWh_{system}$$

Where:

- $kgCO_2e_{generation}$ = Annual carbon emissions from all energy sources used by the system to generate heat or cooling. Calculated from sum of energy from each source used to generate heat or cooling multiplied by their respective emissions factors (see section 5.2.3.2).
- $kgCO_2e_{distribution}$ = Annual carbon emissions from all energy sources used to distribute heating or cooling to all final users. Calculated from the energy inputs used to distribute the heating or cooling multiplied by their respective emission factors (see sections 5.2.3.3 and 5.2.3.4).
- $kWh_{system}$ = Total annual heating/cooling delivered by the district heating and cooling network.

Gross calorific values **shall** be used to determine energy of fuels.

The calculation **shall** use data that coincides with assessed period (see section 5.2.4).

*NOTE The carbon emission factor above is compared to a carbon content limit in section 5.7.*

### 5.2.3.7 Energy used and carbon emission factors for combined heat and power

Electricity used by the building that is generated from combined heat and power (CHP) is treated the same as grid supply electricity when calculating the EUI, and so is assigned the same emission factor as grid supply electricity for carbon reporting purposes.

The energy use for heat from a CHP plant **shall** be calculated according to Equation 3a.

*Equation 3a Energy used for heat from CHP*

$$kWh_{CHPHeat} = (kWh_{generation} + kWh_{distribution} - (kWh_{elec}/GEG)) \times (kWh_{metered} / kWh_{system})$$

Where:

- $kWh_{CHPHeat}$ = annual energy used for heat in building
- $kWh_{generation}$ = total annual energy from all sources used by the CHP to generate heat and power
- $kWh_{distribution}$ = total annual energy from all sources used to distribute heat from the CHP
- $kWh_{elec}$ = total annual electricity delivered by the CHP
- GEG = generation efficiency grid supply electricity (see Equation 3b)
- $kWh_{metered}$ = total annual heat measured at the point of connection to the building
- $kWh_{system}$ = total annual heat delivered by the CHP

*Equation 3b Generation efficiency calculation for grid supply electricity*

GEG = (UK electricity consumed) / (energy content of fuels used for electricity generation)

Where:

- UK electricity consumed (GWh) = see *DUKES* Table 5.1 electricity commodity balance – "Final consumption"
- Energy content of fuels used for electricity generation (GWh) = see *DUKES* Table 5.3.B fuel used in generation – "Total all generating companies". *DUKES* provides in million tonnes of oil equivalent (MTOE), this **shall** be converted to energy content using the ratio 1 MTOE =11,630 GWh.

The carbon emission factor for heat from a combined heat and power plant ($EF_{CHPheat}$) **shall** be calculated according to Equation 3c.

*Equation 3c Carbon emission factors for CHP*

$EF_{CHPheat} = ((kgCO_2e_{generation} + kgCO_2e_{distribution}) / kWh_{CHPheat}) - (kWh_{CHPelectricity} \times EF_{electricity})$

Where:

- $kgCO_2e_{generation}$ = Annual carbon from all energy sources used to generate heat and power. Calculated from the sum of energy from each source multiplied by their respective emissions factors (see section 5.2.2.3).
- $kgCO_2e_{distribution}$ = Annual carbon emissions from all energy used to distribute heating to final users. Calculated from the energy inputs used to distribute the heat multiplied by their respective emission factors (see section 5.2.2.3 and 5.2.2.4).
- $kWh_{CHPelectricity}$ = Annual kWh of electricity generated by CHP and delivered to final users.
- $kWh_{CHPheat}$ = Annual heat generated by CHP and delivered to final users.
- $EF_{electricity}$ = Emission factor for UK grid supply electricity ($kgCO_2e/kWh$) calculated according to 5.2.3.4 using *UK Government Conversion Factors Full Set*.

The calculation **shall** use data that coincides with the assessed period (see section 5.2.4).

## 5.2.4 Assessed period

The assessed period **shall** be the Operational Reporting Period (see section 4.2.4.2).

### 5.2.5 Occupancy rate

The occupancy rate **shall** be calculated using Equation 4.

*Equation 4 Occupancy rate*

$O = (S_t / A_t) \times 100$

$A_t = A_g - A_u$

Where:

- O = Occupancy rate (%);
- $S_t$ = Total occupied floor area (the sum of all separately occupiable spaces), GIA;
- $A_t$ = Total occupiable floor area, GIA;
- $A_g$ = The total GIA of the building;
- $A_u$ = The total floor area of the building not intended to be occupied, GIA.

Separately occupiable spaces are enclosed areas within a building that could be occupied by different tenants/owners (e.g., individual flats in an apartment building), excluding common spaces shared by multiple separately occupiable spaces (e.g., reception and circulation areas).

A separately occupiable space is considered occupied if the following criteria are met: -

- It is fitted out, according to the sector function (e.g., in the case of Offices and Homes, floor finishes, furniture and equipment are present; or, in the case of Storage and Distribution, storage racking is present);
- It is maintained at an occupiable temperature according to the sector function and design;
- Supplied energy comes from all sources intended in the building's energy design (including on-site renewable generation);
- It is used by people, according to the sector function.

*NOTE "Used by people" cannot be based on lease agreement being in place*

#### 5.2.5.1 Minimum occupancy requirements

For buildings intended to be occupied or partly occupied, the occupancy rate (see section 5.2.5) shall be ≥80% on the first day of the Assessed Period according to section 5.2.4.

For buildings not intended to be occupied (i.e. where this would not be intrinsic to their primary function) the building **shall** be operational on the first day of the Assessed Period.

*NOTE 1 This means that occupancy rate requirements do not apply to buildings like datacentres, cold stores, or archives, for which the condition is simply that they need to be operational.*

*NOTE 2 Equation 4 (see section 5.2.5) is based on 'total occupiable area', and so where only part of a building is intended to be occupied, that part is still subject to the occupancy rate requirements above.*

### 5.2.6 Submission requirements

Assessment evidence and reporting for submission to the verifier **shall** include:

- Relevant electrical schematic drawings;
- Energy use:
  - Total, and per fuel type breakdowns, expressed according to the relevant unit(s) (see section 5.2.2);
  - Total energy use excluded from the assessment (see section 5.2.1);
  - A statement confirming how annual operational energy has been measured and reported;
  - Meter readings and other energy use measurement data (see section 5.1.4);
  - Carbon emissions resulting from operational energy usage, including carbon emission factors used (see section 5.2.3.2);
  - If heavy process loads are excluded, details on how the associated carbon emissions are already managed by regulation;
- Sectors and areas:
  - Details of areas assigned different sectors in accordance with section 5.2.7 and Table 12, or classified as Additional Uses (see section 3.1.4.12) in accordance with section 5.2.1.3 and Table 9;
  - Where Additional Uses have been identified in accordance with section 5.2.1.3, details **shall** be submitted separately for energy use, carbon emissions, NIA and GIA, clearly detailing these for both the Additional Uses and the remainder of the building, with no double-counting;
  - Submission demonstrating that energy use intensity limits have been met while netting out all energy and areas associated with Additional Uses;
- Where a life cycle carbon factor is used for a biofuel (see section 5.2.3.3), see section 5.5.4 for submission requirements;
- Occupancy rate calculation data (see section 5.2.5), including:
  - Floor area measurements of the building;
  - Total occupiable area;
  - Separately occupied spaces and unoccupiable areas details;
  - Number of occupants.
- If following 'stepped route' limits for an Existing Building (see section 5.2.7.1), a Retrofit Plan (see section 5.2.8) **shall** be submitted.

## 5.2.7 Limits and pass/fail requirements

When setting operational energy limits (see section 5.2.7.1), all floor areas included for consideration within the sector classification requirements of section 4.2.1.1 that have uses shown in Table 12 **shall** be classified per the table for the purposes of setting the operational energy limit. This does not change the classification of the building.

*NOTE This likely leads to the use of Equation 1a as there will then be multiple sectors/subsectors to consider when setting the limit.*

*Table 12 Classification of particular uses when calculating energy use intensity limits*

| Usage of area within buildings | Sector/subsector limit to use in Equation 1a |
|---|---|
| Entertainment areas, e.g., cinemas | Culture and Entertainment |
| Large server rooms/datacentres (i.e. with more than 100kW of ICT load) | Data Centres |
| Office/admin spaces including small server rooms | Offices |
| Office or Culture & Entertainment spaces that spend >50% of occupied hours being used for catered events for external persons | Retail, Food and Beverage with catering |
| Kitchen spaces providing catering services to Office or Culture & Entertainment spaces used for catered events for external persons (regardless of % of occupied hours), and related spaces such as food storage rooms | Retail, Food and Beverage with catering |
| Canteen, café or fast food with on-site catering, Restaurant, Commercial Kitchen | Retail, Food and Beverage with catering |
| Café or fast food, without on-site catering | Retail, Food and Beverage without catering |
| Shop e.g., general, stationery | Retail, High Street |
| Labs | Science and Technology |
| Gyms | Sport and Leisure, Fitness |
| Indoor sports areas without pools | Sport and Leisure, Dry |
| Pools, steam rooms, saunas, and associated plant room and changing rooms | Sport and Leisure, Wet |

#### 5.2.7.1 Operational energy limits and pass/fail requirements

If one or more operational energy limits are available in Tables OE-1 to OE-3 (see Annex A) for the building type and sector (see sections 4.2.1 and 4.2.1.1), those limits **shall not** be exceeded.

The scope of assessment checked against the limits **shall** be according to section 5.2.1.2, except where stated otherwise in this section.

**Additional Uses**

The scope of assessment for comparison to the limits **shall** exclude any Additional Uses that have been identified (see section 5.2.1.3).

The floor areas related to any Additional Uses **shall** be excluded when calculating the energy use intensity of the building, and when calculating limits using Equations 1a and 1b (see section 4.2.5.2), except when the use usually occurs out-of-hours.

*NOTE 1 Energy consumption related to Additional Uses is still reported but does not need to meet limits.*

*NOTE 2 E.g., For out-of-hours community uses of Schools and Sport and Leisure spaces, the energy consumption is excluded from scope of assessment checked against limits, but floor area is included.*

**Healthcare**

New Healthcare Buildings **shall** comply with the *NHS NZBS*, and the scope **shall** include energy use due to domestic hot water and unregulated loads.

*NOTE 3 Domestic hot water and unregulated loads are optional in the NHS NZBS (though advisory), but are mandatory when seeking conformity with the Standard.*

*NOTE 4 The NHS NZBS does not require verification of in-use performance, while this is required for conformity to the Standard.*

**Data Centres**

Data Centre limits are based on Power Usage Effectiveness (PUE). For Mixed-Use buildings involving areas of building classified as Data Centres, Equation 1a **shall** ignore any areas of Data Centre, and the scope of assessment **shall** treat all areas classified as Data Centres separately to the rest, with the PUE calculated and compared to the limits (see Annex A).

Other areas of the building **shall** follow all other requirements of this section.

**Limit dates**

For New Buildings, the limits **shall** be based on the Date of Commencement of the New Works (see section 4.2.6.1) that were undertaken to construct that building (regardless of whether further works have been undertaken since), or 2025 if that is more recent.

*NOTE 5 This means that in future re-verifications of a building classified as a New Building, the building only ever has to meet the same operational energy limits as when it was originally assessed.*

For Existing Buildings (whether or not Retrofit Works take place), either the 'one-go route' or 'stepped route' limits **shall** be chosen and:

- If the 'one-go route' limits are used, the limits **shall** be based on either:
  - The Date of Commencement of the most recent Retrofit Works to have commenced (see sections 4.2.6.1 and 4.2.6.2); or
  - 2025 where no Retrofit Works have commenced since 2025.
- If the 'stepped route' limits are used, the limits **shall** be based on the date of the start of the Operational Reporting Period (see section 4.2.4.2).
- Where Equations 1a and 1b (see section 4.2.5.2) is used, a consistent choice ('one-go route' vs 'stepped-route') applies across all Existing Areas (see section 3.1.4.11).

If using the 'stepped route', a Retrofit Plan **shall** be produced (see section 5.2.8).

*NOTE 6 E.g., an Existing Building low-energy enough to meet the 'stepped route' limits at the point of assessment may use those limits for that assessment, but it should be noted that the limits will decrease in future assessments. This is why the requirements around Retrofit Plans must be followed, to plan for works to take place in adequate time to ensure the limits are still met in future assessments.*

*NOTE 7 Once a building can meet the 'one-go route' limits, it is recommended to use those and not the stepped limits, as the latter will decrease in future.*

*NOTE 8 Reportable Works do not affect the year that operational aspects are based on.*

**Car Parks**

Energy use in car parks (including electric vehicle charging), even where the car park is internal, **shall** be omitted from the total energy assessment checked against the limit, where this has been submetered. For internal car parks, where energy use is omitted, the area of that car park **shall** also be omitted from the calculation of any internal areas used to normalise the energy use against for each metric.

## 5.2.8 Retrofit Plans

The Retrofit Plan **shall** be in line with requirements of *PAS 2035* (domestic)/*PAS 2038* (non-domestic) and produced as per qualification requirements of the PAS, including:

- A description and timeline of future Retrofit Works to be undertaken, including building fabric and services works;
- Operational energy performance calculations showing that the future Retrofit Works will enable all future limits in Table OE-3 (see Annex A) to be met by those dates. Calculations should be based on energy performance modelling following *CIBSE TM54* (e.g., *Passivhaus*, *NABERS UK* or more general *CIBSE TM54* modelling).
- Embodied carbon calculations for the planned Retrofit Works, showing that the works will meet the upfront carbon limits in Table EC-2 (see Annex A) for those dates. Carbon

factors may be reduced compared to today's levels where the claimant can provide justification for this;

- Evidence that the Plan was written prior to the Retrofit Works being undertaken, and that it influenced the design and installation of those works.

*NOTE Modelling requirements in the second bullet point are preferred over simply demonstrating building regulations compliance.*

# 5.3 On-site renewable electricity generation

## 5.3.1 Scope

### 5.3.1.1 Building type scope

For all building types (see section 4.2.1), on-site renewable electricity generation **shall** be measured, assessed, reported and submitted to the verifier.

### 5.3.1.2 On-site renewable electricity generation assessment scope – general

The scope **shall** only include the following types of on-site generation systems:

- Photovoltaics;
- Wind turbines;
- Hydroelectric turbines.

Systems should be integrated into the building fabric or elsewhere on-site, and **shall** be connected to the consumer-side primary electricity meter of the building. Renewable installations that are off-site may be included where they are directly connected to the consumer-side primary electricity meter of the building.

Where the meter serves multiple buildings, the electricity used by the building being assessed **shall** be apportioned on a floor area weighted basis.

Renewable electricity generated on-site and exported **shall** be:

- Excluded from energy use measurements and therefore any relevant energy use limits (see section 5.2.3);
- Included in scope measured against the renewable electricity generation target (see section 5.3.5)
- Reported in module D2 results annually, according to section 5.1 of the *RICS PS*.

*NOTE As an illustration, if a building were to (1) draw X kWh/m$^2$/year from the national grid, (2) generate and consume renewable electricity generation on-site from solar PV of Y kWh/m$^2$/year, and (3) generate and export renewable electricity generation on-site from solar PV of Z kWh/m$^2$/year – then the building's operational energy use intensity would be (X + Y) kWh/m$^2$/year.*

### 5.3.2 Metrics

The metrics for assessment and for comparison with the on-site renewable electricity generation target **shall** be according to Table 13.

*Table 13 Metrics – on-site renewable electricity generation*

| Building type | Pass/fail metric(s) name and unit | Reporting metric(s) name and unit |
|---|---|---|
| All | Annual on-site renewable electricity generation per $m^2$ building footprint area[a] [kWh/$m^2$ building footprint[a]/year] | Total annual on-site renewable electricity generation [kWh/year]<br>Annual on-site renewable electricity generation that is used on site [kWh/year]<br>Annual on-site renewable electricity generation that is exported [kWh/year]<br>On-site renewable electricity generation capacity [kWp/$m^2$ building footprint[a]] |

[a] Building footprint area = area of land covered by building at ground level, measured to the outer face of external walls, including overhanging parts and attached structures (e.g., garages, porches).

### 5.3.3 Assessed period

The assessed period **shall** be the Operational Reporting Period (see section 4.2.4).

### 5.3.4 Submission requirements

Assessment evidence and reporting for submission to the verifier **shall** include:

- Capacity of on-site renewable electricity generation;
- Total on-site renewable electricity generation used on site;
- Total exported renewable electricity;
- Statement confirming method used to measure and report the above;
- Details of constraints affecting on-site renewable electricity generation and justifying any resulting reduction in target (see section 5.3.5.1).

### 5.3.5 Targets and other pass/fail requirements

#### 5.3.5.1 On-site renewable electricity generation targets

The on-site renewable electricity generation target given in Annex A3 for the building location **shall** be met or exceeded, following any reduction due to the allowances in this section.

The scope of assessment checked against the targets **shall** be according to section 5.3.1.2.

*NOTE 1 The targets in Annex A3 have been calculated with solar PV in mind, but the renewable electricity target can be achieved by any technology that renewably generates electricity (i.e. a wind turbine, hydropower, wave power).*

*NOTE 2 It is assumed that in most cases, the targets will be met by installing solar PV on all practicable roof areas. The presence of rooftop plant, blue or green roofs, biodiversity measures, or amenity space do not automatically constitute valid constraints. A reduced renewable generation target is only permissible where it can be demonstrated that such uses are required, deliverable, and materially restrict the remaining feasible area for renewable installation, and that all remaining practicable areas - including those above or adjacent to plant - have been optimised.*

A reduced renewable generation target is permissible due to the following constraints:

- For New Buildings (see section 4.2.1):
  - Planning or legal constraints (e.g., to heritage buildings or conservation areas);
  - Available space(s) on site (e.g., only very small or impractical installations possible) noting that rooftop plant or amenity provision does not in itself preclude renewable electricity generation where installation above, adjacent to, or integrated with such uses is practicable;
  - Overshadowed roofs;
  - Grid connectivity constraints (e.g., limited access to the electrical grid, or grid capacity issues in the local area).
- For Existing Buildings (see section 4.2.1):
  - All constraints for New Buildings;
  - Access (e.g., for installation and maintenance);
  - Structural capacity (i.e., the building's ability to bear the weight of a system);
  - Existing plant areas (if solar PV cannot be installed on top of the plant);
  - Existing rooflights.

If any of the above constraints are applicable, the target may be reduced using Equation 5.

*Equation 5 Reduced on-site renewable electricity target calculation*

$T_R = T_A \times (A_U / A_{BF})$

Where:

- $T_R$ = Reduced on-site renewable electricity target;
- $T_A$ = On-site renewable electricity target given in Annex A3 for the building location;
- $A_U$ = Total of all unconstrained areas within the building curtilage where renewable electricity generation systems could be installed;
- $A_{BF}$ = Building footprint (see section 5.3.2).

Equation 5 **shall not** be used to increase the target, even where $A_U > A_{BF}$.

Evidence **shall** be provided to the verifier to show which areas within the building curtilage are constrained and unconstrained.

*NOTE 3 E.g., A building with PVs on the roof, but where the roof is completely overshadowed, and no other areas within the curtilage are suitable for renewable electricity generation systems. The target would be reduced to zero using the equation above, as $A_U = 0$.*

*NOTE 4 E.g., An Existing Building with heritage constraints meaning no PVs could be installed anywhere within the building curtilage would similarly reduce the target to zero.*

*NOTE 5 E.g., A building where the roof is overshadowed, but the external car park could have renewables installed within it (e.g. PVs above spaces, or a wind turbine between spaces). Here, $A_U$ would include the area of the car park. If the car park was bigger than the building footprint, the target would remain as per Annex A3.*

The renewable electricity target may also be reduced to equal the building's in-scope annual operational electricity limit (see section 5.2.7), where this is lower than the on-site renewable electricity generation target set in this section.

Further to all of the other requirements of this section, if reused renewable electricity generation systems are being used for on-site renewable electricity generation, the renewable electricity target may be reduced by a further 15%. 'Reused' systems **shall** be defined as to those which were already in-use (on- or off-site) before the commencement of the relevant programme of works where they were installed for the building; or where no works have taken place, if they were already installed on the Existing Building.

The renewable electricity target **shall not** apply if the reductions and constraints from this section reduce the feasible on-site renewable electricity system to a peak capacity of less than:

- 1 kWp on Single Family Homes, or
- 4 kWp on all other buildings.

The scope of assessment checked against the targets **shall** be according to section 5.3.1.

# 5.4 Operational water use

## 5.4.1 Scope

### 5.4.1.1 Building type scope

For all building types (see section 4.2.1), operational water use **shall** be measured, assessed and reported.

### 5.4.1.2 Operational water use assessment scope – general

The scope of operational water use **shall** include all water uses within the curtilage of the building, including rainwater, greywater and treated blackwater. The scope may exclude manufacturing, production, waste treatment or other industrial processes (chemical, physical, electrical, or mechanical processes during the production or manufacture of products) where submetering allows.

## 5.4.2 Metrics

The metrics for assessment and reporting **shall** be according to Table 14.

*Table 14 Metrics – operational water use*

| Reporting metric(s) name and unit |
|---|
| • Annual operational water use [$m^3$/year]<br>• Annual operational water use per $m^2$ GIA [$m^3/m^2$ GIA/year]<br>• Annual operational water use carbon emissions per $m^2$ GIA [$kgCO_2e/m^2$ GIA/year]<br>Also<br>• For Homes and Offices – Litres per person[a] per day [l/person/day]<br>• For Schools – Annual operational water use per pupil[b] per year [$m^3$/pupil/year]<br>• For Data Centres – Water Use Effectiveness (WUE) [WUE] |
| [a] Based on typical number of residents during the assessed period (see section 5.4.4).<br>[b] Based on number of pupils registered, from most recently available data. |

#### 5.4.2.1 Measurement

Water use **shall** be measured according to Table 15.

*Table 15 Measurement – operational water use*

| Water source | Use measurement approach |
|---|---|
| Network water supplier | Meter readings |
| Ground water | Meter readings |
| Rainwater, greywater and treated blackwater | Meter readings |
| Other external water supplies | Meter readings (per source) |

### 5.4.3 Assessment methodology

#### 5.4.3.1 Carbon emissions from operational water

The carbon emissions from water supplied **shall** be calculated by multiplying the water consumption by the following carbon emission factors:

- For water supplied by the network water supplier, use the factors for "water supply" from *UK Government Conversion Factors Full Set*;
- Where water is supplied to the building from offsite sources other than a network supply, use a factor covering the same scope as the network supply emission factor;
- Where an appropriate source-specific emission factor cannot be provided by the water supplier, the network water emission factor should be used instead.

The carbon emissions from water disposed of **shall** be calculated by multiplying the following quantities and carbon emission factors:

- For quantities:
  - Where water disposed of via network water suppliers drains is metered, use the metered disposal data;
  - Where water disposal is not metered, the water treatment carbon emission factor shall be applied to the total building water consumption unless it can be demonstrated that some or all of the water is disposed of via an onsite systems like septic tanks with drainage fields;
- For carbon emission factors:
  - For water supply disposed via the supplier's drains, use the factors for "water treatment" from *UK Government Conversion Factors Full Set*;
  - Any onsite water disposal (e.g., soakaways) may use a factor of zero.

### 5.4.4 Assessed period

The assessed period **shall** be the Operational Reporting Period (see section 4.2.4).

### 5.4.5 Submission requirements

Assessment evidence and reporting for submission to the verifier **shall** include:

- Water use total and per source type breakdowns, excluding water used for processes excluded from the assessment (see section 5.4.1);
- Carbon emission factors used (see section 5.4.3);
- Meter readings and other water use measurement data (see section 5.4.2.1).

### 5.4.6 Limits

No limits are set for operational water use.

*NOTE Once sufficient data is made available, it is the intention that water use limits will be set in future versions of the Standard.*

# 5.5 Fossil fuel free

The Standard generally precludes the use of fossil fuels and certain types of biofuels (see section 5.5.5) however there are some exceptions to this. This section of the Standard outlines these exceptions, and provides assessment and submission requirements where they are used.

## 5.5.1 Scope

### 5.5.1.1 Building type scope

For all building types (see section 4.2.1), all fossil fuel and biofuel use on site **shall** be measured, assessed, reported and submitted to the verifier.

### 5.5.1.2 Fossil fuel free assessment scope – general

The scope **shall** include all fossil fuel and biofuels used by the building.

## 5.5.2 Assessment methodology

### 5.5.2.1 General

All fossil fuel and biofuel use on site **shall** be identified based on a review of the drawings, specifications and other records relating to energy using systems and processes, and of meter reading records.

### 5.5.2.2 Plant supplying energy to multiple buildings

Fossil fuel and biofuel use by the building **shall** include that used in plant supplying energy to multiple buildings where:

- The buildings are all on a single site;
- All the buildings on the site have the same owner (e.g., a hospital campus, university campus, block of flats with communal heating; commercial centre with central heating or cooling).

## 5.5.3 Assessed period

The assessed period **shall** be the Operational Reporting Period (see section 4.2.4).

## 5.5.4 Submission requirements

Assessment evidence and reporting for submission to the verifier **shall** include:

- A statement confirming there is no fossil fuel use on site beyond the allowable cases in section 5.5.5. Evidence of this should include drawings, specifications and other records relating to energy using systems and processes;

- Meter reading records or billing information.
- Where biofuels are used, submit evidence of:
  - Feedstock classification (e.g., first-generation, second-generation, waste-derived);
  - Feedstock origin;
  - Certification (e.g. International Sustainability and Carbon Certification, Roundtable on Sustainable Biomaterials), chain-of-custody approach and protection against double-counting;
  - Transport and processing (if not embedded in carbon factors);
  - Plant compatibility and warranty;
  - Carbon factors calculation (see section 5.2.3.3).

### 5.5.5 Pass/fail requirements

Fossil fuels and first-generation biofuels **shall not** be used on site for in-scope uses (see section 5.5.1), except in any of the following allowable cases:

- Energy uses that are also excluded from the operational energy general assessment scope (see section 5.2.1.2);
- Emergency and life safety systems (e.g., for firefighting, evacuation, back-up power in healthcare settings);
- Essential back-up systems serving buildings with functions of critical importance, defined as Class IV buildings within *BS EN 1998*;
- Essential back-up systems serving data centres or critical server infrastructure in areas of floor classified as Offices where it can be shown that no other options are viable;
- Scientific processes in Science & Technology buildings and areas (e.g. Bunsen burners, cleaning activities) where there is no available alternative;
- Fossil fuels used in construction process (typically reported under module A5.2);
- Use of biofuels is allowed where they are:
  - Second-generation or waste-derived (see sections 3.1.4.21 and 3.1.4.22); and
  - Derived from feedstocks in the United Kingdom or European Economic Area; and
  - Shown to not have high indirect land use change risk under relevant certification or regulation from a scheme approved under the EU Renewable Energy Directive.

*NOTE 1 First-generation biofuels (see section 3.1.4.20) are treated as fossil fuels and cause the building to fail the fossil-fuel-free requirement except where other exclusions apply.*

*NOTE 2 BS EN 1998 Table 4.3 describes Class IV as: Buildings whose integrity during earthquakes is of vital importance for civil protection, e.g., hospitals, fire stations, power plants, etc. This refers directly to BS EN 1990, which describes the equivalent as: Buildings whose failure has high consequence for loss of human life, or that has very great economic, social or environmental consequences, e.g., Grandstands, public buildings where consequences of failure are high (e.g., a concert hall).*

# 5.6 Electricity demand management

## 5.6.1 Scope

### 5.6.1.1 Building type scope

For New Buildings and Existing Buildings (see section 4.2.1), electricity demand management **shall** be measured, assessed, reported and submitted to the verifier, where metering resolution is sufficient.

### 5.6.1.2 Electricity demand management assessment scope – general

An electricity demand management assessment **shall** be carried out for any buildings where GIA > 500m$^2$.

The scope **shall** include all electricity use by the building, except for electricity use that is not in-scope (see section 5.2.1.2).

## 5.6.2 Metrics

The metrics for assessment and reporting **shall** be according to Table 16.

*Table 16 Metrics – Electricity demand management*

| Metering resolution | Reporting metric(s) name and unit |
|---|---|
| ≤½ hour between readings | Top ten recorded demand values [kW]<br>50th percentile demand value [kW]<br>1st percentile demand value [kW] |

## 5.6.3 Measurement methodology

Electricity demand **shall** be measured using meter reading data.

The following **shall** be derived and submitted:

- Top ten recorded demand values [kW]: The ten highest half-hourly demand readings during the assessment period (the overall peak and the next nine highest values);
- 50th percentile demand value [kW]: The median reading, below which 50% of all recorded readings fall;
- 1st percentile demand value [kW]: The reading below which the lowest 1% of all recorded readings fall.

Percentiles **shall** be calculated across the entire assessment period (see section 5.6.4) using standard statistical functions available in spreadsheets or data-analysis software.

*NOTE Calculation across the entire period (as opposed to across a day, week or month) ensures representation of the distribution of demand for the full year (rather than short-term fluctuations).*

### 5.6.4 Assessed period

The assessed period **shall** be the Operational Reporting Period (see section 4.2.4).

### 5.6.5 Submission requirements

Assessment evidence and reporting for submission to the verifier **shall** include:

- Meter readings including date and time of each recorded value;
- Approach, methodology and calculations for percentiles;
- Details of electricity use that is not metered or where the meter does not enable the required reporting.

### 5.6.6 Limits

No limits are set for electricity demand management.

*NOTE Once sufficient data is made available, it is the intention that electricity demand management limits will be set in future versions of the Standard.*

# 5.7 District heating and/or cooling networks

## 5.7.1 Scope

### 5.7.1.1 Building type scope

For all building types (see section 4.2.1) connected to a district heating and/or cooling network (DHCN), the operational energy use, carbon emissions and carbon content of heat/coolth from the DHCN **shall** be measured, assessed, reported and submitted to the verifier.

### 5.7.1.2 District heating and cooling network assessment scope – general

The scope **shall** include all DHCNs connected to the building.

## 5.7.2 Metrics

The metrics for assessment, reporting and comparison with the DHCN limit **shall** be according to Table 17.

*Table 17 Metrics – District heating and cooling networks*

| Pass/fail metric(s) name and unit | Reporting metric(s) name and unit |
|---|---|
| Carbon content for heat/coolth supplied [$kgCO_2e/kWh$] | Energy used by the district energy scheme, associated with generating and distributing the heat/coolth supplied [$kWh/m^2/yr$]<br>Carbon emissions associated with heat/coolth supplied [$kgCO_2e/yr$] |

## 5.7.3 Measurement and assessment methodology

### 5.7.3.1 Heat/coolth measurement

Heat/coolth supplied by DHCNs **shall** be measured by a heat meter(s) at the connection to the building.

### 5.7.3.2 Energy used and carbon emissions factor calculations

The energy use and carbon emissions factors for district heating and district cooling used **shall** be calculated in accordance with the methodology set out in section 5.2.3.6, or where heat is from combined heat and power (CHP), section 5.2.3.7.

#### 5.7.3.3 Recovered heat or cooling

Heat or cooling rejected by other users (e.g., from industrial processes or cooling and refrigeration), **shall** be attributed zero emissions.

Carbon emissions associated with energy used for the distribution and extraction of energy from recovered heat or cooling (e.g., electric pumps) **shall** be included in the assessment.

### 5.7.4 Assessed period

The assessed period **shall** be the Operational Reporting Period (see section 4.2.4).

### 5.7.5 Submission requirements

Assessment evidence and reporting for submission to the verifier **shall** include:

- Operational energy data from meter readings (see section 5.7.3);
- Details and calculations of the carbon emission factors used (see section 5.7.3.2);
- Details on the DHCN including the fuels used to supply the heat/coolth, and justification for the existing/new designation including when it first began operating;
- Workings/calculations relating to the energy use and carbon calculations.

Additionally, if the DHCN currently supplies (or will supply) heat from fossil fuels, details of the network's plan to end fossil fuel use **shall** be submitted, including:

- A written statement confirming that the network will not use fossil fuels by 2040 (see section 5.7.6.2) and that it will meet the relevant carbon intensity limit in the interim. This should be published publicly on the company's website, alongside regular reviews of progress towards fossil fuel free heat;
- Future plant installation, distribution efficiencies, operating temperatures, storage plant requirements, associated design implications and any other related information;
- Calculations for the resulting carbon emissions associated with the heat/coolth supplied, demonstrating that the network will meet the DHCN limit;
- Details showing how the decarbonisation plan is incorporated into the network's business model.

## 5.7.6 Limits and pass/fail requirements

### 5.7.6.1 DHCN limits – general

Carbon content of heat/coolth limits evolve over time as the grid evolves. In any given year, the limit **shall** be set following the requirements of sections 5.7.6.2 and 5.7.6.3, and using that year's carbon content of the grid as per the *UK Government Conversion Factors Full Set*.

The scope of assessment checked against the limits **shall** be according to section 5.7.1.1 using the measurement methodology set out in section 5.2.3.6, or where the heat is from CHP, section 5.2.3.7.

The limits **shall not** be exceeded.

*NOTE 1 Limits are different for existing and new district heating and cooling networks.*

*NOTE 2 This limit applies to the entire network, existing or new, with no allowance for 'sleeving'.*

### 5.7.6.2 DHCN limits and pass/fail requirements – existing networks

From 1 January 2040, heat/coolth supplied by existing DHCNs **shall not** come from fossil fuels. If the DHCN currently uses fossil fuels, the network **shall** have a plan (see section 5.7.5) already in place to stop supplying heat/coolth from fossil fuels by this date.

A DHCN is considered "existing" if in operation, or under construction (in accordance with the definitions given in sections 4.2.6.1 and 4.2.6.2), on or before the date of Version 1 of this Standard.

The carbon factor of heating limit for an existing DHCN **shall** be calculated Equation 6a:

*Equation 6a Carbon factor of heating limit for an existing DHCN*

$$\text{Limit } (kgCO_2e/kWh) = [((1 + \text{Primary distribution losses}) / \text{ASHP SCOP}) + ((1 + \text{Primary distribution losses}) \times \text{Parasitic energy})] \times EF_{electricity}$$

Where the following default values are used:

- District energy scheme with Air Source Heat Pump and *CIBSE CP1* losses, assuming ASHP SCOP = 2.8
- Primary distribution losses = 0.2 (i.e. CP1 limit)
- Parasitic energy (percentage of heat fed into the network) = 0.02
- $EF_{electricity}$ = emissions factor for grid supply electricity ($kgCO_2e/kWh$) calculated according to 5.2.3.4 using the *UK Government Conversion Factors Full Set*.

The carbon factor of coolth limit for an existing DHCN **shall** be calculated using Equation 6b:

*Equation 6b Carbon factor of coolth for an existing DHCN*

Limit ($kgCO_2e/kWh$) = (1 / Chiller SEER) x $EF_{electricity}$

Where the following default value is used:

- On-site chiller, assuming Chiller SEER = 3
- $EF_{electricity}$ = emissions factor for grid supply electricity ($kgCO_2e/kWh$) calculated according to 5.2.3.4 using the *UK Government Conversion Factors Full Set*.

*NOTE 1 E.g., Carbon content of heat limit = 0.125 kgCO2e/kWh-heat, for heat delivered over 2024, where 2024 carbon content of the grid (including WTT and T&D) = 0.275 kgCO2/kWh.*

*NOTE 2 E.g., Carbon content of coolth limit = 0.092 kgCO2e/kWh-coolth, for cooling delivered over 2024, where 2024 carbon content of the grid (including WTT and T&D) = 0.275 kgCO2/kWh.*

### 5.7.6.3 DHCN limits and pass/fail requirements – new networks

Heat/coolth supplied by a new DHCN to the building **shall not** come from fossil fuels.

The carbon factor of heating limit for a new DHCN **shall** be calculated using Equation 7a:

*Equation 7a Carbon factor of heating limit for a new DHCN*

Limit ($kgCO_2e/kWh$) = (1 / ASHP SCOP) x $EF_{electricity}$

Where the following default values are used:

- On-site Air Source Heat Pump, assuming ASHP SCOP = 2.8
- $EF_{electricity}$ = emissions factor for grid supply electricity ($kgCO_2e/kWh$) calculated according to 5.2.3.4 using the *UK Government Conversion Factors Full Set*.

The carbon factor of coolth limit for a new DHCN **shall** be calculated using Equation 7b:

*Equation 7b Carbon factor of coolth limit for a new DHCN*

Limit ($kgCO_2e/kWh$) = (1 / Chiller SEER) x $EF_{electricity}$

Where the following default value is used:

- On-site chiller, assuming Chiller SEER = 3
- $EF_{electricity}$ = emissions factor for grid supply electricity ($kgCO_2e/kWh$) calculated according to 5.2.3.4 using the *UK Government Conversion Factors Full Set*.

*NOTE 1 E.g., Carbon content of heat limit = 0.098 kgCO2e/kWh-heat, for heat delivered over 2024, where 2024 carbon content of the grid (including WTT and T&D) = 0.275 kgCO2/kWh.*

*NOTE 2 E.g., Carbon content of coolth limit = 0.092 kgCO2e/kWh-coolth, for cooling delivered over 2024, where 2024 carbon content of the grid (including WTT and T&D) = 0.275 kgCO2/kWh.*

# 5.8 Space heating and cooling delivered to the building

## 5.8.1 Scope

### 5.8.1.1 Building type scope

For New Buildings (see section 4.2.1), heating and cooling delivered to the building **shall** be measured, assessed, reported and submitted to the verifier.

For Existing Buildings (see section 4.2.1):

- where the Reporting Period End Point (RPEP, see section 4.2.4.1) is in the year 2040 or later, heating and cooling delivered to the building **shall** be measured, assessed, reported and submitted to the verifier;
- where the RPEP is prior to 2040 and heat meters have already been installed, heating and cooling delivered to the building **shall** be measured, assessed, reported and submitted to the verifier.

Required measurements **shall** be taken using heat/coolth meters.

### 5.8.1.2 Heating and cooling delivered to the building assessment scope – general

The scope **shall** include all space heating and space cooling delivered to the building, for use in spaces intended to be occupied (i.e., excluding uses such as cold rooms).

## 5.8.2 Metrics

The metrics for assessment, reporting and comparison with limits for heating and cooling delivered to the building **shall** be according to Table 18.

*Table 18 Metrics – heating and cooling delivered to the building*

| Sector | Pass/fail metric(s) name and unit | Reporting metric(s) name and unit |
|---|---|---|
| Homes and Commercial Residential | Annual space heating delivered to the building [kWh/m$^2$GIA/year][a] | Annual space cooling delivered to the building [kWh/m$^2$GIA/year][a]<br>Peak energy delivered for space heating [W/m$^2$GIA]<br>Peak energy delivered for space cooling [W/m$^2$GIA] |
| All other sectors | | Annual space heating delivered to the building [kWh/m$^2$GIA/year][a] |

| | |
|---|---|
| | Annual space cooling delivered to the building [kWh/m$^2$GIA/year][a] |
| | Peak energy delivered for space heating [W/m$^2$GIA] |
| | Peak energy delivered for space cooling [W/m$^2$GIA] |

[a] Floor area figure used in calculation of metrics and limits to exclude unoccupied spaces

### 5.8.3 Measurement methodology

Heating and cooling delivered to the building **shall** be measured using meter reading data, where available.

If it is not possible to measure the heating/cooling delivered by any Variable Refrigerant Flow systems (VRF) in the building, then instead, the electricity used by those VRF systems **shall** be submetered and the heating/cooling calculated based on the system efficiency and expected annual heating/cooling split.

Where areas of the building are classified as sectors/subsectors that do not have limits (see section 5.8.5), those areas **shall** be submetered in order that heating and cooling delivered to areas with limits may be measured separately.

*NOTE As only Homes and Commercial Residential have space heating limits in this version of the Standard, this means that submetering is required to separately assess the heat/coolth used by those sectors and any others that might share the buildings with them (e.g. retail on the ground floor of a block of flats).*

The floor area measurement convention for each sector **shall** be aligned to operational energy metrics.

### 5.8.4 Assessed period

The assessed period **shall** be the Operational Reporting Period (see section 4.2.4).

### 5.8.5 Limits and pass/fail requirements

#### 5.8.5.1 Limits and pass/fail requirements – general

Limits are set for the following building types:

- Homes and Commercial Residential.

For Data Centres, there is no limit, but all heat demand **shall** be met by heat re-use within the data centre.

The scope of assessment checked against the limits **shall** be according to section 5.8.1.2, subject to the following modifications:

- For Mixed-Use buildings that include areas of the building that are classified as sectors/subsectors without limits, those areas **shall** be excluded from scope.

*NOTE In this version of the Standard, only New Buildings and some sectors have limits associated with space heating delivered to the building, however this is intended to be extended to include Existing Buildings and other sectors in a future version of the Standard, once enough data is available.*

### 5.8.5.2 Heating limits – new buildings

If one or more limits on annual space heating are available in Table OE-4 (see Annex A) for the sector (see section 4.2.1.1), those limits **shall not** be exceeded.

Areas of the building classified as sectors with no heating limits are assessed separately with submetering (see section 5.8.3), do not need to meet limits, and are not used in Equations 1a and 1b if calculating weighted limits.

## 5.8.6 Submission requirements

Assessment evidence and reporting for submission to the verifier **shall** include:

- Details of spaces that are heated or cooled that are not occupied and are excluded from the scope (see section 5.8.1.2);
- Details of how the annual space heating and cooling delivered to the building and peak heating and cooling delivered to the building has been calculated;
- Details of spaces that do and do not have limits, and of submetering;
- Where the heating/cooling delivered by VRF systems is calculated based on electricity use rather than direct measurements, submit calculations and any required supporting evidence;
- If annual heating and cooling demand data is from meter readings, utility bills or energy monitoring system outputs showing the consumption specifically for heating and cooling plant, submetered as required (see section 5.8.3);
- Details of any data losses during the reporting period.

# 5.9 Refrigerants

## 5.9.1 Scope

### 5.9.1.1 Building type scope

For all building types (see section 4.2.1), refrigerants **shall** be assessed, reported and submitted to the verifier.

### 5.9.1.2 Refrigerants assessment scope – general

For the purposes of this Standard the scope of the refrigerant assessment **shall** include all systems containing refrigerants, including but not limited to: fixed air conditioning, fixed heat pumps, chillers, VRF and other fixed refrigeration systems (e.g., for cold storage), except for equipment used in an industrial process (chemical, physical, electrical, or mechanical processes during the production or manufacture of products).

The GWP **shall** be assessed for refrigerants in all in-scope systems using the values from the most recently available version of the *UK Government Conversion Factors Full Set* for both "only Kyoto products" (GHGs covered by the Kyoto protocol) and "non-Kyoto products" (other GHGs) as relevant.

In addition, where the refrigerant gas charge in $CO_2e$ is ≥3,000 $kgCO_2e$ (see Equation 8), the carbon impact of refrigerant leakage for Kyoto products **shall** be assessed in accordance with section 5.9.3. Where possible, the same calculations should be followed for non-Kyoto products too.

*Equation 8 Refrigerant charge in the building*

Refrigerant gas charge in $CO_2e$ ($kgCO_2e$) = $RC_1 \times GWP_1 + RC_2 \times GWP_2 + \ldots + RC_n \times GWP_n$

Where

- $RC_n$= refrigerant charge (kg) for in-scope system n
- $GWP_n$ = GWP of refrigerant ($kgCO_2e/kg$) for in-scope system n

*NOTE 1 This scope of refrigeration systems for which carbon impacts must be reported goes beyond that of the 2024 F-gas regulations and may be increased in future versions of the Standard.*

*NOTE 2 The refrigerant gas charge in $CO_2e$ is calculated in the same way as the F-gas equivalent required within the F-gas regulations, but uses the GWP factors in the UK Government Conversion Factors Full Set.*

### 5.9.2 Metrics

The metrics for refrigerant gases and the carbon impact of refrigerant leakage **shall** be according to Table 19.

*Table 19 Metrics – Refrigerants*

| Metric type | Pass/fail metric(s) name and unit | Reporting metric(s) name and unit |
|---|---|---|
| Global Warming Potential (for each refrigerant system) | GWP of refrigerants [kg$CO_2$e/kg] | N/A |
| Annual carbon equivalent of refrigerant gas leakage, where building refrigerant charge ≥3,000kg$CO_2$e. | N/A | Annual carbon impact of refrigerant leakage for GHGs covered by Kyoto protocol [kg$CO_2$e/year]<br>*Optional: Annual carbon impact of refrigerant leakage of other GHGs [kg$CO_2$e/year]* |

### 5.9.3 Assessment methodology

For each in-scope product refrigerant gas (see section 5.9.1.2) the carbon impact of refrigerant leakage **shall** be calculated using Equation 9c, using a refrigerant leakage mass from:

- Equation 9a where all data required by the equation is available; or
- Equation 9b in all other cases.

*Equation 9a Refrigerant leakage quantity – change in quantity approach*

$$L = S + A - E$$

Where:

- L = mass of refrigerant leakage (kg) during the assessed period (see section 5.9.4);
- S = mass of refrigerant (kg) in the system at the start of the assessed period;
- A = mass of refrigerant (kg) added to the system during the assessed period;
- E = mass of refrigerant (kg) in the system at the end of the assessed period.

*Equation 9b Refrigerant leakage quantity – quantity added approach*

$$L = A$$

Where:

- L = mass of refrigerant leakage (kg) during the assessed period (see section 5.9.4);
- A = mass of refrigerant (kg) added to the system during the assessed period.

*Equation 9c Carbon emissions from refrigerant leakage*

E = L x GWP

Where:

- E = carbon emissions due to refrigerant leakage;
- L = mass of refrigerant leakage calculated from Equation 9a or 9b;
- GWP = global warming potential ($kgCO_2e/kg$) of the refrigerant, taken from the most recently available version of the *UK Government Conversion Factors Full Set* – both "only Kyoto products" and "non-Kyoto products" as relevant.

### 5.9.4 Assessed period

The assessed period **shall** be the Operational Reporting Period (see section 4.2.4).

### 5.9.5 Submission requirements

Assessment evidence and reporting for submission to the verifier **shall** include:

- Refrigerant leakage mass and carbon emissions – total, and per refrigerant type;
- Full calculations of refrigerant leakage and carbon emissions including quantities and carbon emissions factors (see section 5.9.3);
- Description of each in-scope system including the type of system, associated refrigerant equipment, number of refrigeration units, refrigerant and refrigerant charge;
- Inspection reports, servicing records or similar documentation for each in-scope system, including any details of refrigerant and leakage or recharge quantities during the assessed period;
- Installation date of each in-scope system. Or, if the installation date is not known, the installation date may be estimated;
- A written statement confirming all in-scope refrigerants either meet the limit or where refrigerants don't meet the limit, provide justification in line with the stated exceptions (see section 5.9.1.15.9.6).

### 5.9.6 GWP limits

The GWP of the refrigerant gas contained within each in-scope refrigerant system (see section 5.9.1.2) **shall not** exceed the GWP limit in Annex A4, except where:

- It can be demonstrated that it is not possible to retrofit the system to use a replacement refrigerant due to health and safety concerns or physical site constraints; or
- Systems were installed before the release of Version 1 of the Standard and:
  - No works have been carried out on the system since then; and
  - The Reporting Period End Point (see section 4.2.4.1) is prior to 1 January 2030.

Where GWP limits are exceeded, systems **shall** be fitted with leak detection to facilitate system shutdown and prevent further refrigerant leakage.

*NOTE 1 The GWP limit applies to all refrigeration systems in the building regardless of whether the reporting threshold has been met (see section 5.9.1.2 and Equation 9a).*

*NOTE 2 The GWP limits are likely to be decreased in future versions of the Standard, particularly for other fixed refrigeration systems (see section 5.9.1.2).*

# 5.10 Carbon offsetting

## 5.10.1 Scope

### 5.10.1.1 Building and works type scope

For all building and works types (see section 4.2.1), carbon emissions may be offset and reported. If carbon offsetting is not undertaken the requirements in this section do not apply.

### 5.10.1.2 Carbon offsetting scope – general

If carbon emissions are offset and reported, the requirements of this section 5.10 **shall** apply to all carbon emissions reported to the verifier, including the following as a minimum:

- Upfront carbon emissions due to New or Retrofit Works (see section 5.1.2.4);
- Upfront carbon emissions due to Reportable Works (see section 5.1.2.5);
- Operational energy use carbon emissions (see section 5.2.3);
- Operational water use carbon emissions (see section 5.4.3);
- Carbon impact of refrigerant leakage for GHGs covered by Kyoto protocol (see section 5.9.3).

## 5.10.2 Carbon offsetting methodology

Carbon offsetting **shall** either take the form of carbon credits (see section 5.10.2.1) or, for electricity, renewable electricity procurement (see section 5.10.2.2).

### 5.10.2.1 Allowable types of carbon offsetting – carbon credits

Carbon credits **shall** be from programmes and categories that have been assessed as meeting the requirements of one of the following, or a combination or both:

- ICROA endorsed voluntary carbon market standards;
- ICVCM Core Carbon Principle-labelled credits.

The vintage (year) of the carbon credits **shall** be no more than five years before or after the Reporting Period End Point (see section 4.2.4).

The carbon credits **shall** be purchased and retired specifically for the in-scope carbon emissions (see section 5.10.1).

*NOTE 2 All carbon credits that fulfil these requirements comply with this Standard. There are no further requirements, such as the location(s) or the specific type(s) of offsetting included in the carbon credit.*

*NOTE 3 There are no allowable types of carbon insetting*

### 5.10.2.2 Allowable types of renewable electricity procurement

Renewable electricity procurement **shall** only be used to offset electricity that is used for uses within the operational energy scope (see section 5.2.1.2) and **shall** fulfil the following requirements:

- If the electricity is rated 'Silver' or 'Gold' according to the requirements of '*Report 3 Renewable Energy Procurement Determining the Performance of Your Electricity Strategy*' by the UKGBC:
  - The rating is confirmed by a suitably qualified energy procurement expert (with at least 3 years' experience of electricity procurement in a professional capacity).
- Or if the electricity is sourced through an electricity supply contract:
  - 100% of the electricity is matched by REGOs from UK generators, and all REGOs have been retired;
  - The tariff is a 'Deep Green' tariff or supply contract, according to the requirements of 'Report 1: Renewable Energy Procurement Key Actions for Built Environment Stakeholders' by the UKGBC.
- Or if the electricity is sourced through a direct Power Purchase Agreement (PPA) contract:
  - The contract was entered into within three years of the generator's construction;
  - The generators are owned and operated by a company(ies) that invest in the construction of new renewable assets.

Allowed types of renewable electricity procurement **shall** only be used to offset Greenhouse Gas Protocol Scope 2 emissions from electricity supplied via the grid. Greenhouse Gas Protocol Scope 3 emissions from both transmission and distribution losses (T&D), and well to tank emissions associated with transmissions and distribution losses (WTT-T&D) **shall** be offset with carbon credits (see section 5.2.3.4).

The renewable electricity procurement contract **shall** cover at least some of the Operational Reporting Period (ORP). Where the contract only covers part of the ORP, only operational carbon emissions reported during that part of the ORP **shall** be offset by allowed renewable electricity procurement.

### 5.10.2.3 Quantity of carbon offsets

The quantity of carbon offsets **shall** be equal to the total in-scope carbon emissions (see section 5.10.1.2).

### 5.10.2.4 Submission requirements

Carbon offsetting evidence and reporting for submission to the verifier **shall** include the following details, where applicable:

- Total in-scope carbon emissions (see section 5.10.1);
- The quantity of carbon credits procured (see section 5.10.2.3);
- The quantity of applicable renewable electricity procured (see section 5.10.2.2);
- Details of the renewable electricity tariff or contract agreement with the energy supplier;
- Details of the carbon credits procured including the type of carbon credit, supplier, vintage, registry reference numbers and compliance with the requirements (see section 5.10.2.1);
- Written confirmation that the carbon credits and renewable electricity procured fulfil the requirements (see section 5.10.2);
- Evidence of the procurement and retirement of the carbon credits.

# 6. Verification

## 6.1 Introduction and principles

To demonstrate conformity to the Standard, the claimant **shall** have their assessment and submission (see section 5) third-party verified to ensure that all requirements of the Standard have been met.

*NOTE The verification will check that limits, targets and pass/fail requirements have been met, but also that all aspects of reporting have been undertaken in accordance with the Standard's requirements.*

The claimant **shall** follow the process set out in section 6.2.

The third-party verifier **shall** meet the competency requirements in section 6.3.

## 6.2 Verification process

### 6.2.1 Roles within the verification process

The figure below **shall** be followed, and sets out the roles and relationships between parties such as the claimant, verifier, and Net Zero Carbon Buildings Standard Ltd, in relation to administration and management of the verification process.

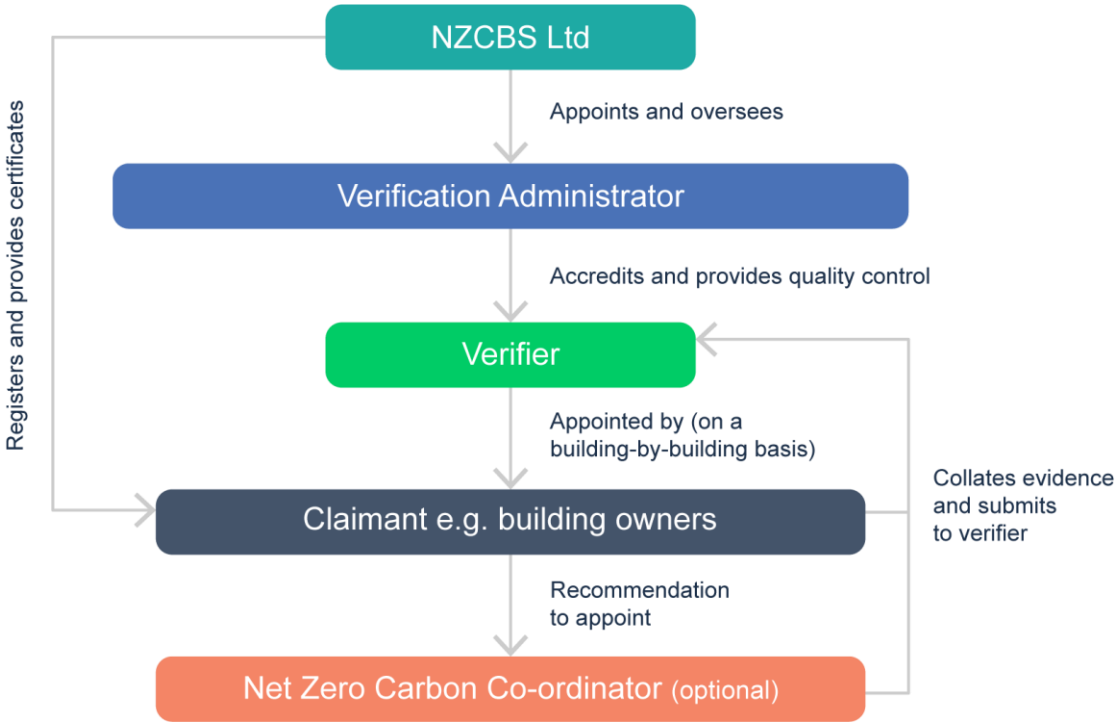



*Figure 9 Verification roles*

## 6.2.2 Claimant verification process

The process shown in the figure below **shall** be followed by the claimant, from the point of initial engagement through to final confirmation of verification.

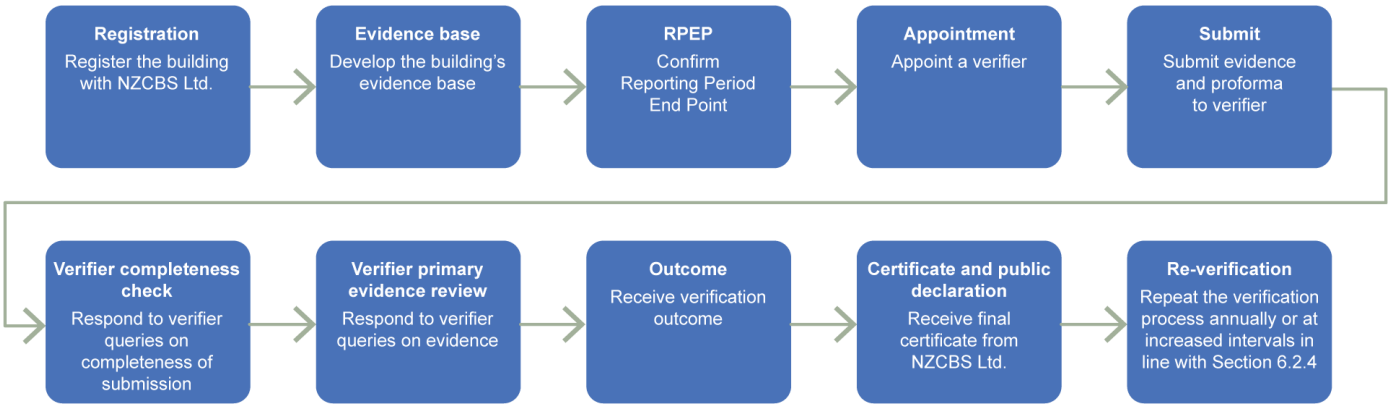



*Figure 10 Claimant verification process flowchart*

## 6.2.3 Timing – verification

The first verification of the building **shall** be completed as soon as possible after the first Reporting Period End Point (see section 4.2.4.1) per Figure 11 below.

*NOTE This requires the building to have been in use and occupied for at least 12 months (see section 5.2.5 for occupancy requirements).*

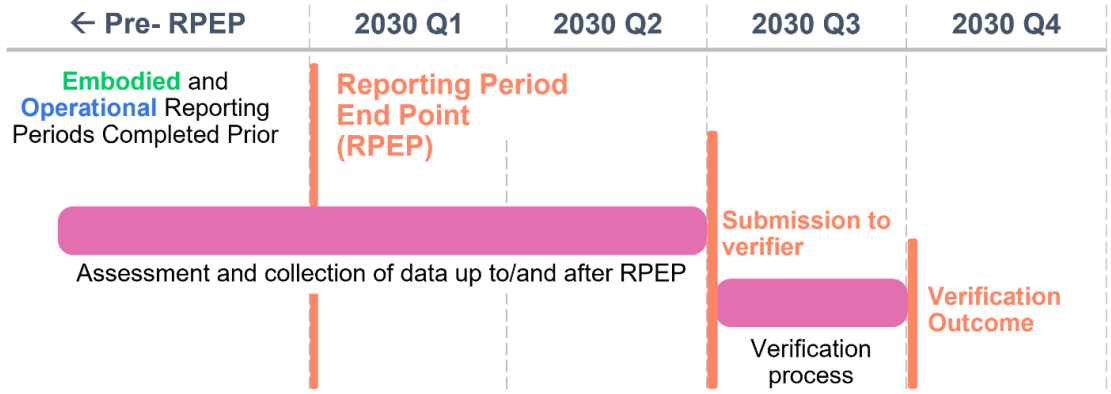



*Figure 11 Expected process from Reporting Period End Point to end of verification process (indicative timelines only)*

### 6.2.4 Timing – reverification

Following first verification, the claimant should have their building reverified annually for a minimum of two years (i.e., a total of three sequential verifications without gaps). After the third sequential verification is complete, the claimant may reduce the frequency of reverification as follows:

- Where New Works, Retrofit Works or Reportable Works are undertaken (see sections 3.1.4.6 to 3.1.4.8) within a year of the previous verification, reverification should occur annually;
- Where no such works take place, reverification may occur once every three years. Where this is the case, the claimant should submit all relevant assessment data (see section 5) to the NZCBS Ltd approved online verification platform annually, which will be subject to random audits by the Verification Administrator.

If verifications occur less frequently than outlined above, then the frequency reduction **shall** not apply again until three new sequential verifications have been completed without gaps.

*NOTE For simple reverifications where no works have been undertaken, no embodied carbon assessment or reporting would be required (see section 5.1).*

### 6.2.5 Timing – practical completion

In order to minimise the risk of incomplete embodied carbon data relating to works undertaken, the claimant should complete an upfront carbon assessment (see section 5.1.2.4) at the time of practical completion of any works, and should have this reviewed by an independent third party (independent is defined in section 6.3).

Annex E provides a fully verified route to checking performance at practical completion.

In both instances, the assessment data should be retained by the claimant for use as part of the whole-building submission at the time of verification.

*NOTE The best-practice requirements above seek to ensure that any verification queries arise at a point in time when the claimant is best placed to respond to them. The more time that passes between Practical Completion and the start of the verification process, the harder it can become to collate the evidence necessary for verification to take place.*

## 6.3 Verifier competencies

The verifier **shall** be an independent third party (either an individual or a company, see Annex D) that has been trained and assessed to have met the following competency requirements:

1. UK NZCBS requirements and thresholds – Familiarity with the Standard's scope, performance targets, reporting formats, and acceptable data sources for both embodied and operational aspects.
2. Whole Life Carbon Assessment (WLCA) methodologies – Detailed knowledge of the *RICS PS* and the underlying carbon accounting principles and science.
3. Construction methods and systems – Understanding of common and emerging building construction technologies, materials, and systems relevant to both operational and embodied carbon performance.
4. Construction project documentation – Ability to interpret and cross-reference design drawings, specifications, bills of quantities, operation & maintenance manuals, and site records for verification purposes.
5. Operational energy performance – Understanding of building energy modelling, metering, and in-use performance evaluation, including operational energy metrics in the Standard and normative and informative references (e.g. *CIBSE TM54*, *NABERS UK*). Ability to assess quality of retrofit plans in alignment with *PAS 2035*/*PAS 2038*.
6. Understanding of building water use and measurement through metering and billing.
7. Up to date knowledge of refrigerant use, including systems and type of refrigerant, and familiarity with inspection reports and other service records for systems using refrigerant.
8. Familiarity with the use of carbon offsetting including credit purchase and retirement. Understanding of how to assess carbon credits for appropriate quality and origin.
9. Evidence review and validation – Ability to assess and interrogate evidence provided as part of an as-built whole life carbon assessment, including:
    a. Cross-checking quantities (e.g. concrete volumes in delivery tickets) against assessment assumptions.
    b. Assessing whether values are reasonable for the building type, scale, and specification.
    c. Identifying potential inconsistencies, omissions, manipulation, other verification risks and material misstatement.
    d. Reviewing carbon calculations, including assessing source and suitability of emission factors applied.
10. Verification principles and practice:
    a. Knowledge of general verification, auditing, and assurance standards (e.g. *ISO 14064-3*, *ISO/IEC 17029*), including impartiality, evidence-based decision making, materiality, and record-keeping.
    b. Understanding of the principles identified in *ISO/IEC 17029* 'Fair presentation', 'Competence', 'Confidentiality', 'Openness'. 'Responsibility', 'Responsiveness to

complaints' and 'Risk-based approach'. Also 'Conservativeness' and 'Professional scepticism'.

11. Relevant standards and guidance – Awareness of supporting frameworks and standards such as:
    a. *ISO 14040* and *ISO 14044* (LCA methodology)
    b. *ISO 14025* and *EN 15804* (EPDs)
    c. *GHG Protocol*
    d. *ISO 14065*
    e. *ISO 14064-3*
12. Stakeholder engagement – Skills to communicate with project teams, resolve queries, and request clarifications while maintaining professional independence.
13. Digital tools and data management – Competence in using WLCA and operational energy software, databases, and digital evidence management systems securely and effectively.

By independent, this means the individual **shall not** have been involved in – and **shall not** work for a company that has been involved in – the design, construction, operation of the building, nor the net zero carbon aligned building claim submission.

*NOTE Initially, verification will be undertaken exclusively by verifiers employed by the Verification Administrator (VA) organisation. NZCBS Ltd, along with the VA, will be developing a training and accreditation programme for 3rd party verifiers, and a list of relevant accreditations/qualifications that verifiers can use to deem to satisfy specific competencies.*

# 7. Communication

This section sets out the requirements governing how claims of conformity to the Standard **shall** be communicated. Its intent is to ensure that all public statements, marketing materials, and technical documentation referencing the Standard are clear, accurate, and do not mislead.

This section **shall** be read in conjunction with the Communication Rules document, available on the UK Net Zero Carbon Buildings Standard website, and provided as part of the registration process.

## 7.1 Principles

All references to this Standard **shall** be accurate, factual and time-bounded.

Communications **shall** clearly distinguish between design intentions and verified outcomes.

Information that has not been verified (see section 6) **shall not** be presented as verified.

Any misuse of the Standard's name, logo or marks may result in withdrawal of verification status, and public correction.

## 7.2 Dates of claim

The start and end date for which the claim is related **shall** be clearly communicated.

A verified claim of conformity (see section 6) **shall** only relate to the 12 months prior to the Reporting Period End Point (RPEP, see section 4.2.4.1).

Where consecutive claims of conformity have been verified, the start and end points of the first and last consecutive claims may be used. Where gaps occur between claims, the start and end dates of such gaps **shall** be clearly communicated. Where a claim has lapsed, any reference to past claims **shall** reference the start and end dates of those past claims.

Where more than a year has passed since a previously verified claim's RPEP, that claim **shall not** be presented in a manner that implies current validity.

See Figure 3 and Figure 4 for example timelines.

## 7.3 Certificates

Certificates issued in relation to a verified claim of conformity (see section 6) **shall** only be issued by NZCBS Ltd. The certificate **shall** contain information about the building's performance against the Standard's limits and targets, and **shall** be available for public download via the NZCBS Ltd public list of Net Zero Carbon Aligned Buildings (located on the UK Net Zero Carbon Buildings Standard website).

## 7.4 Use of language

### 7.4.1 Language prior to verification

Claims of conformity **shall not** be made before a building has been verified (see section 6). Any other language that might imply verified status (e.g., "*compliant with*", "*certified to*", or "*aligned with*") **shall not** be used prior to successful verification.

References to the Standard during the design or construction stages may use the following statement: *"targeting verification to the UK Net Zero Carbon Buildings Standard"*, but the Standard's name (other than as defined in this statement), logo, or verification mark **shall not** be used prior to successful verification.

*NOTE This statement can be used in project communications, drawings, websites, or reports.*

### 7.4.2 Language following full assessment and verification

Once verification has been completed and approved (see section 6), the claimant may refer to the building using one of the following exact phrases, as applicable to the verified assessment route:

- Whole-building assessment (sections 4 to 5.9): "*Net Zero Carbon Aligned Building*";
- Landlord-only approach (Annex F2): "*Net Zero Carbon Aligned Landlord Spaces*";
- Tenant-only approach (Annex F3): "*Net Zero Carbon Aligned Tenancy*".

Where emissions have been offset in accordance with section 5.10, the words "*(plus offsets)*" may be appended to the relevant phrase above (e.g., for a whole-building assessment with offsets: "*Net Zero Carbon Aligned Building (plus offsets)*").

Statements of successful verification to the Standard may use the following: "*verified to Version <insert version number> of the UK Net Zero Carbon Buildings Standard as being a <insert verified assessment route> for the dates <start of claim period> to <end of claim period>*".

*NOTE An example statement would be "verified to Version 1 of the UK Net Zero Carbon Buildings Standard as being a Net Zero Carbon Aligned Building for the dates 17/02/2026 to 16/02/2027".*

The official certificate of verification and approved mark may be displayed in accordance with the Communication Rules document, available on the UK Net Zero Carbon Buildings Standard website, and provided as part of the registration process.

Any public or private communication of successful verification **shall** clearly include all of the following information:

- Standard version (see section 4.1.2);
- Scope of the verification including:
  - Type of building and works (see section 4.2.1);
  - Sectors and subsectors within the building (see section 4.2.1.1);
- Date of the Reporting Period End Point (see section 4.2.4.1);
- Dates to which the claim relates (start and end dates of the Operating Reporting Period, see section 4.2.4.2);
- Date of limits and targets used (see section 4.2.5.3).

### 7.4.3 Language following PC-on-track verified checks

Once the PC-on-track checks have been completed (see Annex E) and verified (see section 6), the claimant may use the following statement when referring to the building: "*As of* <insert Date of Practical Completion here>*, this building was predicted to be able to achieve all the requirements of the UK Net Zero Carbon Buildings Standard once fully in use. The claimant commits to completing full or landlord-only verification to the Standard once occupied. Where ownership or control of the building transfers, responsibility for progressing to verification shall pass to the successor claimant.*"

For short-form language, the following may be used; "*At practical completion, this building was predicted to be on track to meet the UK Net Zero Carbon Buildings Standard*", however the long-form version should be used wherever possible.

*NOTE There is no alternative form of words if the claimant has offset any emissions around the time of Practical Completion, as these are not reported to the verifier at this stage (see annex E).*

## 7.5 Prohibited claims

It is explicitly prohibited to make, publish or imply any claim of conformity, verification, or alignment prior to successful completion of the formal verification process or PC-on-track process, or following an unsuccessful formal verification or PC-on-track process.

Misuse of the Standard's name, mark, or logo may result in withdrawal of verification, public correction, and further action as determined by Net Zero Carbon Buildings Standard Ltd.

# Annex A: Limits and targets

## A1 Embodied carbon limits

*Table EC-1 Upfront carbon limits, New Works*

| ← Date of Commencement (see section 4.2.6) | Commercial Residential | Culture & Entertainment | | Data Centres | Healthcare | Higher Education | Homes | | Hotels | Offices | | | Retail | School | Science & Technology | Sport & Leisure | Storage & Distribution | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | All subsectors | Performance | Collection / Archives | All subsectors | All subsectors | All subsectors | Single family homes | Flats | All subsectors | Whole building | Shell and core + Cat A | Shell and core | All subsectors | All subsectors | All subsectors | All subsectors | Whole building | Shell and core |
| | kgCO₂e/m²GIA | | | | | | | | | | | | | | | | | |
| **2025** | 580 | 855 | 570 | 745 | 790 | 640 | 430 | 565 | 670 | 805 | 595 | 520 | 715 | 585 | 755 | 820 | 635 | 415 |
| **2026** | 550 | 810 | 540 | 705 | 750 | 610 | 400 | 525 | 635 | 765 | 565 | 495 | 680 | 555 | 715 | 780 | 605 | 395 |
| **2027** | 525 | 770 | 515 | 670 | 710 | 575 | 375 | 490 | 605 | 725 | 535 | 470 | 645 | 530 | 680 | 740 | 570 | 375 |
| **2028** | 495 | 725 | 485 | 635 | 670 | 545 | 345 | 450 | 570 | 685 | 505 | 440 | 610 | 495 | 640 | 695 | 540 | 355 |
| **2029** | 465 | 685 | 460 | 600 | 635 | 515 | 320 | 420 | 540 | 645 | 475 | 415 | 575 | 470 | 605 | 660 | 510 | 330 |
| **2030** | 435 | 640 | 425 | 555 | 590 | 480 | 290 | 380 | 500 | 595 | 440 | 385 | 535 | 435 | 565 | 610 | 475 | 305 |
| **2031** | 405 | 595 | 400 | 520 | 550 | 445 | 270 | 355 | 470 | 565 | 415 | 365 | 500 | 405 | 525 | 575 | 445 | 290 |
| **2032** | 380 | 560 | 375 | 490 | 515 | 420 | 255 | 335 | 440 | 525 | 385 | 340 | 470 | 385 | 495 | 535 | 415 | 270 |
| **2033** | 350 | 510 | 340 | 445 | 475 | 385 | 235 | 305 | 400 | 485 | 355 | 310 | 430 | 350 | 450 | 490 | 380 | 250 |
| **2034** | 315 | 465 | 310 | 405 | 430 | 350 | 210 | 280 | 365 | 435 | 320 | 280 | 390 | 315 | 410 | 445 | 345 | 225 |
| **2035** | 285 | 420 | 280 | 365 | 390 | 315 | 190 | 250 | 330 | 395 | 290 | 255 | 350 | 280 | 370 | 405 | 315 | 205 |
| **2036** | 260 | 380 | 255 | 330 | 350 | 285 | 175 | 225 | 300 | 355 | 260 | 230 | 320 | 255 | 335 | 365 | 280 | 185 |
| **2037** | 240 | 350 | 235 | 305 | 325 | 265 | 160 | 210 | 275 | 330 | 245 | 215 | 295 | 240 | 310 | 335 | 260 | 170 |
| **2038** | 220 | 325 | 215 | 280 | 300 | 240 | 150 | 195 | 255 | 300 | 220 | 190 | 270 | 220 | 285 | 310 | 240 | 155 |
| **2039** | 200 | 295 | 200 | 260 | 275 | 225 | 135 | 175 | 235 | 275 | 200 | 175 | 250 | 205 | 260 | 285 | 220 | 140 |
| **2040** | 185 | 270 | 180 | 235 | 250 | 205 | 125 | 160 | 215 | 250 | 185 | 160 | 225 | 190 | 240 | 260 | 200 | 130 |
| **2041** | 165 | 245 | 165 | 215 | 225 | 185 | 110 | 145 | 195 | 225 | 165 | 145 | 205 | 175 | 215 | 235 | 185 | 115 |
| **2042** | 150 | 220 | 150 | 195 | 205 | 165 | 100 | 135 | 175 | 210 | 155 | 135 | 185 | 160 | 195 | 210 | 165 | 110 |
| **2043** | 135 | 200 | 135 | 175 | 185 | 150 | 90 | 120 | 155 | 185 | 135 | 120 | 165 | 145 | 175 | 190 | 150 | 95 |
| **2044** | 120 | 175 | 120 | 155 | 165 | 135 | 80 | 105 | 140 | 160 | 120 | 105 | 150 | 130 | 155 | 170 | 130 | 85 |

All limits are whole building unless noted otherwise.

| ← Date of Commencement (see section 4.2.6) | Commercial Residential | Culture & Entertainment | | Data Centres | Healthcare | Higher Education | Homes | | Hotels | Offices | | | Retail | School | Science & Technology | Sport & Leisure | Storage & Distribution | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | All subsectors | Performance | Collection / Archives | All subsectors | All subsectors | All subsectors | Single family homes | Flats | All subsectors | Whole building | Shell and core + Cat A | Shell and core | All subsectors | All subsectors | All subsectors | All subsectors | Whole building | Shell and core |
| | $kgCO_2e/m^2GIA$ | | | | | | | | | | | | | | | | | |
| **2045** | 105 | 155 | 105 | 135 | 145 | 115 | 70 | 95 | 125 | 145 | 105 | 95 | 130 | 120 | 140 | 150 | 115 | 75 |
| **2046** | 95 | 135 | 90 | 120 | 125 | 105 | 65 | 80 | 105 | 130 | 95 | 85 | 115 | 100 | 120 | 130 | 100 | 65 |
| **2047** | 80 | 120 | 80 | 105 | 110 | 90 | 55 | 70 | 95 | 115 | 85 | 75 | 100 | 90 | 105 | 115 | 90 | 60 |
| **2048** | 70 | 100 | 70 | 90 | 95 | 75 | 45 | 60 | 80 | 90 | 65 | 55 | 85 | 80 | 90 | 95 | 75 | 45 |
| **2049** | 60 | 85 | 55 | 75 | 80 | 65 | 40 | 50 | 65 | 80 | 60 | 50 | 70 | 70 | 75 | 80 | 65 | 40 |
| **2050** | 45 | 70 | 45 | 60 | 65 | 50 | 30 | 40 | 55 | 65 | 50 | 40 | 60 | 55 | 60 | 65 | 50 | 35 |
| All limits are whole building unless noted otherwise. | | | | | | | | | | | | | | | | | | |

*Table EC-2 Upfront carbon limits, Retrofit Works*

| Date of Commencement (see section 4.2.6) | Commercial Residential | Culture & Entertainment | | Data Centres | Healthcare | Higher Education | Homes | | Hotels | Offices | | | Retail | School | Science & Technology | Sport & Leisure | Storage & Distribution | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | All subsectors | Performance | Collection and Archives | All subsectors | All subsectors | All subsectors | Single family homes | Flats | All subsectors | Whole building | Shell and core + Cat A | Shell and core | All subsectors | All subsectors | All subsectors | All subsectors | Whole building | Shell and core |
| | $kgCO_2e/m^2GIA$ | | | | | | | | | | | | | | | | | |
| **2025** | 460 | 605 | 450 | 525 | 615 | 475 | 270 | 425 | 520 | 660 | 450 | 375 | 500 | 420 | 605 | 655 | 390 | 170 |
| **2026** | 435 | 570 | 425 | 495 | 585 | 455 | 255 | 395 | 490 | 625 | 430 | 355 | 475 | 400 | 575 | 620 | 370 | 160 |
| **2027** | 415 | 545 | 405 | 475 | 555 | 425 | 235 | 370 | 470 | 595 | 405 | 340 | 450 | 380 | 545 | 590 | 350 | 150 |
| **2028** | 390 | 510 | 385 | 450 | 525 | 405 | 220 | 340 | 440 | 560 | 385 | 320 | 425 | 355 | 515 | 555 | 330 | 145 |
| **2029** | 370 | 485 | 365 | 425 | 495 | 385 | 205 | 315 | 420 | 530 | 360 | 300 | 400 | 335 | 485 | 525 | 310 | 135 |
| **2030** | 345 | 450 | 335 | 390 | 460 | 355 | 185 | 285 | 390 | 490 | 335 | 280 | 375 | 310 | 455 | 485 | 290 | 125 |
| **2031** | 320 | 420 | 315 | 370 | 430 | 330 | 170 | 270 | 365 | 460 | 315 | 265 | 350 | 295 | 420 | 460 | 275 | 120 |
| **2032** | 300 | 395 | 295 | 345 | 405 | 315 | 160 | 255 | 340 | 430 | 295 | 245 | 330 | 275 | 395 | 430 | 255 | 110 |
| **2033** | 280 | 360 | 270 | 315 | 370 | 285 | 150 | 230 | 310 | 395 | 270 | 225 | 300 | 250 | 360 | 390 | 235 | 105 |
| **2034** | 250 | 330 | 245 | 285 | 335 | 260 | 135 | 210 | 285 | 355 | 245 | 205 | 275 | 225 | 330 | 355 | 210 | 90 |
| **2035** | 225 | 295 | 220 | 260 | 305 | 235 | 120 | 190 | 255 | 325 | 220 | 185 | 245 | 205 | 300 | 325 | 190 | 80 |
| **2036** | 205 | 270 | 200 | 235 | 275 | 215 | 110 | 170 | 235 | 290 | 200 | 165 | 225 | 185 | 270 | 295 | 170 | 75 |
| **2037** | 190 | 250 | 185 | 215 | 255 | 200 | 105 | 160 | 215 | 270 | 185 | 155 | 205 | 170 | 250 | 270 | 160 | 70 |
| **2038** | 175 | 230 | 170 | 200 | 235 | 180 | 95 | 150 | 200 | 245 | 165 | 140 | 190 | 155 | 230 | 250 | 145 | 65 |
| **2039** | 160 | 210 | 160 | 185 | 215 | 170 | 85 | 135 | 185 | 225 | 155 | 130 | 175 | 145 | 210 | 230 | 135 | 60 |
| **2040** | 150 | 190 | 145 | 165 | 195 | 155 | 80 | 120 | 170 | 205 | 140 | 115 | 160 | 130 | 195 | 210 | 120 | 50 |
| **2041** | 130 | 175 | 130 | 155 | 180 | 140 | 70 | 110 | 155 | 185 | 125 | 105 | 145 | 120 | 175 | 190 | 110 | 50 |
| **2042** | 120 | 155 | 120 | 140 | 160 | 125 | 65 | 105 | 135 | 170 | 115 | 100 | 130 | 110 | 160 | 170 | 100 | 45 |
| **2043** | 110 | 145 | 110 | 125 | 145 | 115 | 60 | 90 | 120 | 150 | 105 | 85 | 115 | 95 | 140 | 155 | 90 | 40 |
| **2044** | 95 | 125 | 95 | 110 | 130 | 100 | 55 | 80 | 110 | 130 | 90 | 75 | 105 | 85 | 125 | 140 | 80 | 35 |
| **2045** | 85 | 110 | 85 | 95 | 115 | 85 | 45 | 75 | 100 | 120 | 80 | 70 | 95 | 75 | 115 | 120 | 70 | 30 |
| **2046** | 75 | 95 | 75 | 85 | 100 | 80 | 45 | 60 | 85 | 105 | 70 | 60 | 80 | 65 | 100 | 105 | 60 | 25 |
| **2047** | 65 | 85 | 65 | 75 | 90 | 70 | 35 | 55 | 75 | 90 | 65 | 55 | 70 | 60 | 85 | 95 | 55 | 25 |
| **2048** | 60 | 75 | 55 | 65 | 75 | 60 | 30 | 45 | 65 | 75 | 50 | 40 | 60 | 45 | 75 | 80 | 45 | 20 |
| **2049** | 50 | 60 | 45 | 55 | 65 | 50 | 30 | 40 | 55 | 65 | 45 | 40 | 50 | 40 | 60 | 65 | 40 | 20 |
| **2050** | 40 | 50 | 40 | 45 | 55 | 40 | 20 | 30 | 45 | 55 | 35 | 30 | 45 | 35 | 50 | 55 | 30 | 10 |
| All limits are whole building unless noted otherwise. | | | | | | | | | | | | | | | | | | |

*Table EC-3 Upfront carbon limits, Reportable Works*

| Date of Commencement (see section 4.2.6) | Commercial Residential | Culture & Entertainment | Data Centres | Healthcare | Higher Education | Homes | Hotels | Office | | Retail | School | Science & Technology | Sport & Leisure | Storage & Distribution |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Cat A + B | Cat B | | | | | Cat A + B |
| | $kgCO_2e/m^2GIA$ | | | | | | | | | | | | | |
| **2025** | To be confirmed once sufficient data lodged via the Standard | | | | | | | 285 | 210 | To be confirmed once sufficient data lodged via the Standard | | | | 220 |
| **2026** | | | | | | | | 270 | 200 | | | | | 210 |
| **2027** | | | | | | | | 255 | 190 | | | | | 200 |
| **2028** | | | | | | | | 240 | 180 | | | | | 185 |
| **2029** | | | | | | | | 230 | 170 | | | | | 175 |
| **2030** | | | | | | | | 210 | 155 | | | | | 165 |
| **2031** | | | | | | | | 200 | 145 | | | | | 155 |
| **2032** | | | | | | | | 185 | 135 | | | | | 145 |
| **2033** | | | | | | | | 170 | 125 | | | | | 130 |
| **2034** | | | | | | | | 155 | 115 | | | | | 120 |
| **2035** | | | | | | | | 140 | 105 | | | | | 110 |
| **2036** | | | | | | | | 125 | 90 | | | | | 95 |
| **2037** | | | | | | | | 115 | 85 | | | | | 90 |
| **2038** | | | | | | | | 105 | 80 | | | | | 80 |
| **2039** | | | | | | | | 95 | 70 | | | | | 75 |
| **2040** | | | | | | | | 90 | 65 | | | | | 70 |
| **2041** | | | | | | | | 80 | 60 | | | | | 60 |
| **2042** | | | | | | | | 75 | 55 | | | | | 55 |
| **2043** | | | | | | | | 65 | 50 | | | | | 50 |
| **2044** | | | | | | | | 55 | 40 | | | | | 45 |
| **2045** | | | | | | | | 50 | 40 | | | | | 40 |
| **2046** | | | | | | | | 45 | 35 | | | | | 35 |
| **2047** | | | | | | | | 40 | 30 | | | | | 30 |
| **2048** | | | | | | | | 30 | 25 | | | | | 25 |
| **2049** | | | | | | | | 30 | 20 | | | | | 20 |
| **2050** | | | | | | | | 25 | 15 | | | | | 20 |

*Table EC-4 Life cycle embodied carbon limits, New Works*

| Date of Commencement (see section 4.2.6) | Commercial Residential | Culture & Entertainment | Data Centres | Healthcare | Higher Education | Homes | Hotels | Office | Retail | School | Science & Technology | Sport & Leisure | Storage & Distribution |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2025 | No limit in this version of the Standard. Limit in subsequent versions to be confirmed | | | | | | | | | | | | |
| 2026 | | | | | | | | | | | | | |
| 2027 | | | | | | | | | | | | | |
| 2028 | | | | | | | | | | | | | |
| 2029 | | | | | | | | | | | | | |
| 2030 | | | | | | | | | | | | | |
| 2031 | | | | | | | | | | | | | |
| 2032 | | | | | | | | | | | | | |
| 2033 | | | | | | | | | | | | | |
| 2034 | | | | | | | | | | | | | |
| 2035 | | | | | | | | | | | | | |
| 2036 | | | | | | | | | | | | | |
| 2037 | | | | | | | | | | | | | |
| 2038 | | | | | | | | | | | | | |
| 2039 | | | | | | | | | | | | | |
| 2040 | | | | | | | | | | | | | |
| 2041 | | | | | | | | | | | | | |
| 2042 | | | | | | | | | | | | | |
| 2043 | | | | | | | | | | | | | |
| 2044 | | | | | | | | | | | | | |
| 2045 | | | | | | | | | | | | | |
| 2046 | | | | | | | | | | | | | |
| 2047 | | | | | | | | | | | | | |
| 2048 | | | | | | | | | | | | | |
| 2049 | | | | | | | | | | | | | |
| 2050 | | | | | | | | | | | | | |
| All limits are whole building unless noted otherwise. | | | | | | | | | | | | | |

## A1.1 Upfront carbon limit for renewables

*Table EC-5 Upfront carbon limits, renewable electricity generation systems*

| System | kg$CO_2$e/kWp limit |
|---|---|
| Photovoltaics electricity generation: | 1000 |
| Wind turbines and hydroelectric electricity generation: | n/a (reporting only) |

*NOTE In addition to meeting the upfront carbon limits, there are targets on the amount of renewable energy that must be generated on-site, see Annex A3.*

# A2 Operational energy limits

To be used in conjunction with sections 5.2 and 5.8 of the Standard. The figure overleaf illustrates how the operational energy limits vary with time, with details given in section 5.2, and values provided in Table OE-1 to Table OE-3.

Table OE-1 provides operational energy limits for New Buildings.

Table OE-2 provides operational energy limits for Existing Buildings, where the claimant is following the 'one-go route', regardless of whether any retrofit has been undertaken recently.

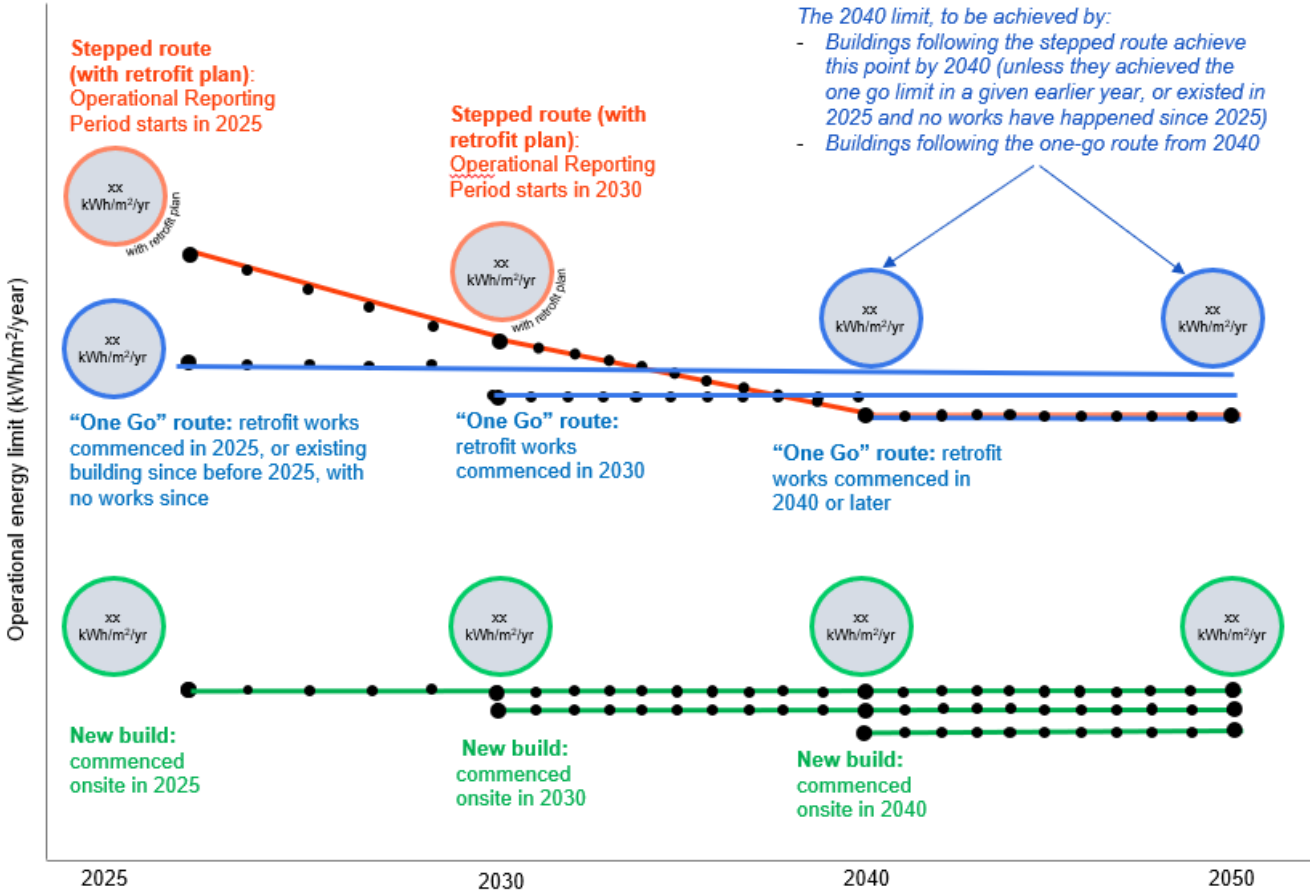
Table OE-3 provides operational energy limits for Existing Buildings, where the claimant is following the 'stepped route', regardless of whether any retrofit has been undertaken recently.

Table OE-4 provides limits on space heating for applicable sectors.

***Existing buildings following the stepped route (with Retrofit Plan):***
*Buildings following that route have to show, in any given year, that their energy use is at or below the limit given in Table OE-3 for the year their Operational Reporting Period (ORP, see 4.2.4.2) starts, putting them at or below the orange line.*
*However, if in any given year they meet the one-go route limit for that year (Table OE-2), they can switch to the one-go route, meaning they will not need to show future improvements, and can retain that limit in future years.*

***Existing Buildings following the one-go route***
*Limits are fixed based on the time the development commenced onsite (or 2025, in the case of an existing building with no works since 2025).*
*Once verified using the limits in Table OE-2, a building will retain the same OE limit in future verifications.*

***New Buildings:***
*Limits are fixed based on the time the development commenced onsite.*
*Once verified using the limits in Table OE-1, a building will retain the same OE limit in future verifications.*




This diagram is illustrative. In practice, the limits applying to each sector vary in how much they reduce over time and in the relative levels of new build vs retrofit limits. In sectors where energy use tends to be more influenced by systems and technology (e.g. Datacentres, Storage & Distribution), there is less difference between Retrofit and New Build limits, than in sectors where fabric performance is more influential on energy use, and opportunities for improvements are typically be more constrained (e.g. Homes).

*Figure A-1 Approach taken to operational energy limits (for information)*

*Table OE-1 Energy use intensity limits, New Buildings*

| ← Date of Commencement (see section 4.2.6) | Commercial Residential | | Culture & Entertainment | | | Data Centres | | Healthcare | | | | | Higher Ed. | Homes | | Hotels | Offices (either /GIA or /NIA metrics may be used) | | | | | | | Retail | | | | | | Schools | | | Science & Technology | Sport & Leisure | | | Storage & Distribution | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Student resi. | Care homes | Performance | Collection | Archives | Low utilisation | High utilisation | Acute Trust | Care Trust | Community Trust | Mental health & Learning Trust | Ambulance Trust | - | Single family homes | Flats | - | General - Whole building | | General - Landlord-only route | | General - Tenant-only route | Call Centres | | Trading Floors | Supermarket | High street retail, dept. store | F&B without catering[a] | F&B with catering[b] | Landlord Area Within Commercial/Shopping Centres[c] | Retail warehouse | Early years | Primary | Secondary incl. SEN | - | Dry | Wet | Fitness | Unconditioned storage | Conditioned storage | Cold store |
| | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | PUE | PUE | - | - | - | - | - | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²NIA/yr | kWh/m²GIA/yr | kWh/m²NIA/yr | kWh/m²NIA/yr | kWh/m²GIA/yr | kWh/m²NIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²CPA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr |
| **2025** | 75 | 150 | 80 | 60 | 5 | 1.40 | 1.20 | *As per NHS NZBS* | | | | | 100 | 50 | 50 | 125 | 90 | 113 | 54 | 68 | 45 | 135 | 169 | 155 | 194 | 200 | 80 | 215 | 380 | 55 | 80 | 50 | 45 | 60 | 305 | 80 | 350 | 150 | 40 | 90 | 175 |
| **2026** | 74 | 147 | 79 | 59 | 5 | 1.40 | 1.20 | | | | | | 98 | 50 | 50 | 122 | 88 | 110 | 53 | 66 | 44 | 131 | 164 | 150 | 188 | 194 | 78 | 209 | 370 | 54 | 78 | 50 | 45 | 59 | 297 | 79 | 344 | 148 | 39 | 88 | 169 |
| **2027** | 72 | 144 | 77 | 58 | 5 | 1.39 | 1.19 | | | | | | 95 | 49 | 50 | 119 | 85 | 106 | 51 | 64 | 42 | 127 | 159 | 145 | 181 | 188 | 76 | 202 | 359 | 53 | 75 | 49 | 44 | 58 | 289 | 78 | 337 | 145 | 38 | 85 | 162 |
| **2028** | 70 | 140 | 75 | 56 | 5 | 1.38 | 1.18 | | | | | | 92 | 48 | 49 | 116 | 82 | 103 | 49 | 61 | 42 | 122 | 153 | 140 | 175 | 182 | 73 | 195 | 348 | 52 | 72 | 48 | 43 | 57 | 280 | 76 | 330 | 142 | 37 | 82 | 155 |
| **2029** | 69 | 137 | 74 | 55 | 5 | 1.38 | 1.18 | | | | | | 90 | 48 | 49 | 113 | 79 | 99 | 47 | 59 | 40 | 118 | 148 | 135 | 169 | 176 | 71 | 189 | 338 | 51 | 70 | 48 | 43 | 56 | 272 | 75 | 324 | 140 | 36 | 79 | 148 |
| **2030** | 67 | 134 | 72 | 54 | 5 | 1.37 | 1.17 | | | | | | 87 | 47 | 48 | 110 | 76 | 95 | 46 | 58 | 37 | 113 | 141 | 130 | 163 | 170 | 68 | 182 | 327 | 50 | 67 | 47 | 42 | 55 | 264 | 74 | 317 | 137 | 35 | 76 | 141 |
| **2031** | 65 | 130 | 70 | 52 | 5 | 1.36 | 1.16 | | | | | | 84 | 46 | 48 | 107 | 74 | 93 | 44 | 55 | 38 | 109 | 136 | 125 | 156 | 164 | 66 | 175 | 316 | 49 | 64 | 46 | 41 | 54 | 255 | 72 | 310 | 134 | 34 | 73 | 134 |
| **2032** | 64 | 127 | 69 | 51 | 5 | 1.36 | 1.16 | | | | | | 82 | 46 | 48 | 104 | 71 | 89 | 43 | 54 | 35 | 104 | 130 | 120 | 150 | 158 | 64 | 169 | 306 | 48 | 62 | 46 | 41 | 53 | 247 | 71 | 304 | 132 | 33 | 70 | 127 |
| **2033** | 62 | 124 | 67 | 50 | 5 | 1.35 | 1.15 | | | | | | 79 | 45 | 47 | 101 | 68 | 85 | 41 | 51 | 34 | 100 | 125 | 114 | 143 | 152 | 61 | 162 | 295 | 47 | 59 | 45 | 40 | 52 | 239 | 70 | 297 | 129 | 31 | 67 | 120 |
| **2034** | 60 | 120 | 65 | 48 | 5 | 1.34 | 1.14 | | | | | | 76 | 44 | 47 | 98 | 65 | 81 | 39 | 49 | 32 | 95 | 119 | 109 | 136 | 146 | 59 | 155 | 284 | 46 | 56 | 44 | 39 | 51 | 230 | 68 | 290 | 126 | 30 | 64 | 113 |

| ← Date of Commencement (see section 4.2.6) | Commercial Residential | | Culture & Entertainment | | | Data Centres | | Healthcare | | | | | Higher Ed. | Homes | | Hotels | Offices (either /GIA or /NIA metrics may be used) | | | | | | | Retail | | | | | | Schools | | | Science & Technology | Sport & Leisure | | | Storage & Distribution | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Student resi. | Care homes | Performance | Collection | Archives | Low utilisation | High utilisation | Acute Trust | Care Trust | Community Trust | Mental health & Learning Trust | Ambulance Trust | - | Single family homes | Flats | - | General - Whole building | | General - Landlord-only route | | General - Tenant-only route | Call Centres | | Trading Floors | Supermarket | High street retail, dept. store | F&B without catering[a] | F&B with catering[b] | Landlord Area Within Commercial/Shopping Centres[c] | Retail warehouse | Early years | Primary | Secondary incl. SEN | - | Dry | Wet | Fitness | Unconditioned storage | Conditioned storage | Cold store |
| | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | PUE | PUE | - | - | - | - | - | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²NIA/yr | kWh/m²GIA/yr | kWh/m²NIA/yr | kWh/m²NIA/yr | kWh/m²GIA/yr | kWh/m²NIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²CPA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr |
| **2035** | 59 | 117 | 64 | 47 | 5 | 1.34 | 1.14 | *As per NHS NZBS* | | | | | 74 | 44 | 46 | 95 | 62 | 78 | 37 | 46 | 32 | 91 | 114 | 104 | 130 | 140 | 56 | 149 | 274 | 45 | 54 | 44 | 39 | 50 | 222 | 67 | 284 | 124 | 29 | 61 | 106 |
| **2036** | 57 | 114 | 62 | 46 | 5 | 1.33 | 1.13 | | | | | | 71 | 43 | 46 | 92 | 60 | 75 | 36 | 45 | 30 | 86 | 108 | 99 | 124 | 134 | 54 | 142 | 263 | 44 | 51 | 43 | 38 | 49 | 214 | 66 | 277 | 121 | 28 | 58 | 99 |
| **2037** | 55 | 110 | 60 | 44 | 5 | 1.32 | 1.12 | | | | | | 68 | 42 | 46 | 89 | 57 | 71 | 34 | 43 | 28 | 82 | 103 | 94 | 118 | 128 | 52 | 135 | 252 | 43 | 48 | 42 | 37 | 48 | 205 | 64 | 270 | 118 | 27 | 55 | 92 |
| **2038** | 54 | 107 | 59 | 43 | 5 | 1.32 | 1.12 | | | | | | 66 | 42 | 45 | 86 | 54 | 68 | 32 | 40 | 28 | 77 | 96 | 89 | 111 | 122 | 49 | 129 | 242 | 42 | 46 | 42 | 37 | 47 | 197 | 63 | 264 | 116 | 26 | 52 | 85 |
| **2039** | 52 | 104 | 57 | 42 | 5 | 1.31 | 1.11 | | | | | | 63 | 41 | 45 | 83 | 51 | 64 | 31 | 39 | 25 | 73 | 91 | 84 | 105 | 116 | 47 | 122 | 231 | 41 | 43 | 41 | 36 | 46 | 189 | 62 | 257 | 113 | 25 | 49 | 78 |
| **2040** | 50 | 100 | 55 | 40 | 4 | 1.30 | 1.10 | | | | | | 60 | 40 | 44 | 80 | 48 | 60 | 29 | 36 | 24 | 68 | 85 | 78 | 98 | 110 | 44 | 115 | 220 | 40 | 40 | 40 | 35 | 45 | 180 | 60 | 250 | 110 | 23 | 46 | 71 |
| **2050** | 50 | 100 | 55 | 40 | 4 | 1.30 | 1.10 | | | | | | 60 | 40 | 44 | 80 | 48 | 60 | 29 | 36 | 24 | 68 | 85 | 78 | 98 | 110 | 44 | 115 | 220 | 40 | 40 | 40 | 35 | 45 | 180 | 60 | 250 | 110 | 23 | 46 | 71 |

[a] i.e. only cold/hot drinks or cold food, no on-site kitchen

[b] e.g., restaurant, pub, fast food with on-site food preparation / catering

[c] this is only for use in commercial centres / shopping centres, to create area-weighted whole building limits, using the landlord areas and retail mix

*Table OE-2 Energy use intensity limits, Existing Buildings following the one-go route (applicable regardless of whether retrofit has been undertaken recently)*

| ← Date of Commencement (see section 4.2.6) | Commercial Residential | | Culture & Entertainment | | | Data Centres | | Healthcare | | | | | Higher Ed. | Homes | | Hotels | Offices (either /GIA or /NIA metrics may be used) | | | | | | | | Retail | | | | | | Schools | | | Science & Technology | Sport & Leisure | | | Storage & Distribution | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Student resi. | Care homes | Performance | Collection | Archives | Low utilisation | High utilisation | Acute Trust | Care Trust | Community Trust | Mental health & Learning Trust | Ambulance Trust | - | Single family homes | Flats | | General - Whole building | | General - Landlord-only route | | General - Tenant-only route | Call Centres | | Trading Floors | Supermarket | High street retail, Department | F&B without catering [a] | F&B with catering [b] | Landlord Area Within Commercial/Shopping Centres [c] | Retail warehouse | Early years | Primary | Secondary incl. SEN | - | Dry | Wet | Fitness | Unconditioned storage | Conditioned storage | Cold store |
| | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | PUE | PUE | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²NIA/yr | kWh/m²GIA/yr | kWh/m²NIA/yr | kWh/m²NIA/yr | kWh/m²GIA/yr | kWh/m²NIA/yr | kWh/m²GIA/yr | kWh/m²NIA/yr | kWh/m²GIA/y | kWh/m²GIA/y | kWh/m²GIA/y | kWh/m²GIA/y | kWh/m²CPA/y | kWh/m²GIA/y | kWh/m²GIA/y | kWh/m²GIA/y | kWh/m²GIA/y | kWh/m²GIA/y | kWh/m²GIA/y | kWh/m²GIA/y | kWh/m²GIA/y | kWh/m²GIA/y | kWh/m²GIA/y | kWh/m²GIA/y |
| **2025** | 110 | 220 | 130 | 100 | 10 | 1.40 | 1.20 | 258 | 140 | 162 | 166 | 182 | 130 | 80 | 75 | 180 | 105 | 131 | 63 | 79 | 52 | 200 | 250 | 230 | 288 | 230 | 100 | 250 | 450 | 80 | 100 | 90 | 85 | 95 | 360 | 210 | 500 | 280 | 40 | 115 | 250 |
| **2026** | 108 | 216 | 128 | 98 | 10 | 1.40 | 1.20 | 259 | 140 | 163 | 167 | 182 | 127 | 79 | 75 | 176 | 102 | 128 | 61 | 76 | 52 | 196 | 245 | 225 | 281 | 224 | 97 | 243 | 438 | 79 | 97 | 89 | 84 | 94 | 351 | 206 | 490 | 275 | 39 | 112 | 240 |
| **2027** | 106 | 211 | 125 | 96 | 10 | 1.39 | 1.19 | 259 | 140 | 163 | 167 | 182 | 123 | 78 | 74 | 172 | 99 | 124 | 59 | 74 | 50 | 192 | 240 | 220 | 275 | 217 | 94 | 236 | 425 | 77 | 94 | 88 | 83 | 92 | 341 | 202 | 480 | 270 | 38 | 108 | 230 |
| **2028** | 103 | 206 | 122 | 93 | 10 | 1.38 | 1.18 | 259 | 140 | 163 | 167 | 182 | 119 | 77 | 74 | 168 | 96 | 120 | 58 | 73 | 47 | 187 | 234 | 215 | 269 | 210 | 90 | 228 | 412 | 75 | 90 | 86 | 81 | 90 | 331 | 198 | 470 | 264 | 37 | 104 | 219 |
| **2029** | 101 | 202 | 120 | 91 | 10 | 1.38 | 1.18 | 259 | 140 | 163 | 167 | 182 | 116 | 76 | 73 | 164 | 93 | 116 | 56 | 70 | 46 | 183 | 229 | 210 | 263 | 204 | 87 | 221 | 400 | 74 | 87 | 85 | 80 | 89 | 322 | 194 | 460 | 259 | 36 | 100 | 209 |
| **2030** | 99 | 197 | 117 | 89 | 9 | 1.37 | 1.17 | 259 | 140 | 163 | 167 | 182 | 112 | 74 | 72 | 160 | 90 | 113 | 54 | 68 | 45 | 178 | 223 | 205 | 256 | 197 | 84 | 214 | 387 | 72 | 84 | 84 | 79 | 87 | 312 | 190 | 450 | 254 | 35 | 96 | 198 |
| **2031** | 96 | 192 | 114 | 86 | 9 | 1.36 | 1.16 | 259 | 140 | 163 | 167 | 182 | 108 | 73 | 72 | 156 | 87 | 109 | 52 | 65 | 44 | 174 | 218 | 200 | 250 | 190 | 80 | 206 | 374 | 70 | 80 | 82 | 77 | 85 | 302 | 186 | 440 | 248 | 34 | 93 | 188 |
| **2032** | 94 | 188 | 112 | 84 | 9 | 1.36 | 1.16 | 259 | 140 | 163 | 167 | 182 | 105 | 72 | 71 | 152 | 84 | 105 | 50 | 63 | 42 | 170 | 213 | 195 | 244 | 184 | 77 | 199 | 362 | 69 | 77 | 81 | 76 | 84 | 293 | 182 | 430 | 243 | 33 | 89 | 177 |
| **2033** | 92 | 183 | 109 | 82 | 9 | 1.35 | 1.15 | 259 | 140 | 163 | 167 | 182 | 101 | 71 | 71 | 148 | 80 | 100 | 48 | 60 | 40 | 165 | 206 | 190 | 238 | 177 | 74 | 192 | 349 | 67 | 74 | 80 | 75 | 82 | 283 | 178 | 420 | 238 | 31 | 85 | 167 |

| ← Date of Commencement (see section 4.2.6) | Commercial Residential | | Culture & Entertainment | | | Data Centres | | Healthcare | | | | | Higher Ed. | Homes | | Hotels | Offices (either /GIA or /NIA metrics may be used) | | | | | | | | Retail | | | | | | Schools | | | Science & Technology | Sport & Leisure | | | Storage & Distribution | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Student resi. | Care homes | Performance | Collection | Archives | Low utilisation | High utilisation | Acute Trust | Care Trust | Community Trust | Mental health & Learning Trust | Ambulance Trust | - | Single family homes | Flats | | General - Whole building | | General - Landlord-only route | | General - Tenant-only route | Call Centres | | Trading Floors | Supermarket | High street retail, Department | F&B without catering [a] | F&B with catering [b] | Landlord Area Within Commercial/Shopping Centres [c] | Retail warehouse | Early years | Primary | Secondary incl. SEN | - | Dry | Wet | Fitness | Unconditioned storage | Conditioned storage | Cold store |
| | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | PUE | PUE | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²NIA/yr | kWh/m²GIA/yr | kWh/m²NIA/yr | kWh/m²NIA/yr | kWh/m²GIA/yr | kWh/m²NIA/yr | kWh/m²GIA/yr | kWh/m²GIA/y | kWh/m²GIA/y | kWh/m²GIA/y | kWh/m²GIA/y | kWh/m²CPA/y | kWh/m²GIA/y | kWh/m²GIA/y | kWh/m²GIA/y | kWh/m²GIA/y | kWh/m²GIA/y | kWh/m²GIA/y | kWh/m²GIA/y | kWh/m²GIA/y | kWh/m²GIA/y | kWh/m²GIA/y |
| **2034** | 89 | 178 | 106 | 79 | 9 | 1.34 | 1.14 | 259 | 140 | 163 | 167 | 182 | 97 | 70 | 70 | 144 | 77 | 96 | 46 | 58 | 38 | 161 | 201 | 185 | 231 | 170 | 70 | 184 | 336 | 65 | 70 | 78 | 73 | 80 | 273 | 174 | 410 | 232 | 30 | 81 | 156 |
| **2035** | 87 | 174 | 104 | 77 | 8 | 1.34 | 1.14 | 259 | 140 | 163 | 167 | 182 | 94 | 68 | 69 | 140 | 74 | 93 | 44 | 55 | 38 | 156 | 195 | 180 | 225 | 164 | 67 | 177 | 324 | 64 | 67 | 77 | 72 | 79 | 264 | 170 | 400 | 227 | 29 | 77 | 146 |
| **2036** | 85 | 169 | 101 | 75 | 8 | 1.33 | 1.13 | 259 | 140 | 163 | 167 | 182 | 90 | 67 | 69 | 136 | 71 | 89 | 43 | 54 | 35 | 152 | 190 | 175 | 219 | 157 | 64 | 170 | 311 | 62 | 64 | 76 | 71 | 77 | 254 | 166 | 390 | 222 | 28 | 74 | 135 |
| **2037** | 82 | 164 | 98 | 72 | 8 | 1.32 | 1.12 | 259 | 140 | 163 | 167 | 182 | 86 | 66 | 68 | 132 | 68 | 85 | 41 | 51 | 34 | 148 | 185 | 170 | 213 | 150 | 60 | 162 | 298 | 60 | 60 | 74 | 69 | 75 | 244 | 162 | 380 | 216 | 27 | 70 | 125 |
| **2038** | 80 | 160 | 96 | 70 | 8 | 1.32 | 1.12 | 259 | 140 | 163 | 167 | 182 | 83 | 65 | 68 | 128 | 65 | 81 | 39 | 49 | 32 | 143 | 179 | 165 | 206 | 144 | 57 | 155 | 286 | 59 | 57 | 73 | 68 | 74 | 235 | 158 | 370 | 211 | 26 | 66 | 114 |
| **2039** | 78 | 155 | 93 | 68 | 8 | 1.31 | 1.11 | 259 | 140 | 163 | 167 | 182 | 79 | 64 | 67 | 124 | 62 | 78 | 37 | 46 | 32 | 139 | 174 | 160 | 200 | 137 | 54 | 148 | 273 | 57 | 54 | 72 | 67 | 72 | 225 | 154 | 360 | 206 | 25 | 62 | 104 |
| **2040** | 75 | 150 | 90 | 65 | 7 | 1.30 | 1.10 | 258 | 140 | 162 | 166 | 182 | 75 | 62 | 66 | 120 | 58 | 73 | 35 | 44 | 29 | 134 | 168 | 155 | 194 | 130 | 50 | 140 | 260 | 55 | 50 | 70 | 65 | 70 | 215 | 150 | 350 | 200 | 23 | 58 | 93 |
| **2050** | 75 | 150 | 90 | 65 | 7 | 1.30 | 1.10 | 258 | 140 | 162 | 166 | 182 | 75 | 62 | 66 | 120 | 58 | 73 | 35 | 44 | 29 | 134 | 168 | 155 | 194 | 130 | 50 | 140 | 260 | 55 | 50 | 70 | 65 | 70 | 215 | 150 | 350 | 200 | 23 | 58 | 93 |

[a] i.e. only cold/hot drinks or cold food, no on-site kitchen

[b] e.g., restaurant, pub, fast food with on-site food preparation / catering

[c] this is only for use in commercial centres / shopping centres, to create area-weighted whole building limits, using the landlord areas and retail mix

*Table OE-3 Energy use intensity limits, Existing Buildings following the stepped route (applicable regardless of whether retrofit has been undertaken recently)*

| ← Date of Commencement (see section 4.2.6) | Commercial Residential | | Culture & Entertainment | | | Data Centres | | Healthcare | | | | | Higher Ed. | Homes | | Hotels | Offices (either /GIA or /NIA metrics may be used) | | | | | | | Retail | | | | | | Schools | | | Science & Technology | Sport & Leisure | | | Storage & Distribution | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Student resi. | Care homes | Performance | Collection | Archives | Low utilisation | High utilisation | Acute Trust | Care Trust | Community Trust | Mental health & Learning Trust | Ambulance Trust | - | Single family homes | Flats | | General - Whole building | | General - Landlord-only route | | General - Tenant-only route | Call Centres | | Trading Floors | Supermarket | High street retail, dept. store | F&B without catering [a] | F&B with catering [b] | Landlord Area Within Commercial/Shopping Centres[c] | Retail warehouse | Early years | Primary | Secondary incl. SEN | - | Dry | Wet | Fitness | Unconditioned storage | Conditioned storage | Cold store |
| | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | PUE | PUE | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²NIA/yr | kWh/m²GIA/yr | kWh/m²NIA/yr | kWh/m²NIA/yr | kWh/m²GIA/yr | kWh/m²NIA/yr | kWh/m²NIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²CPA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr |
| **2025** | 135 | 290 | 165 | 125 | 20 | 1.40 | 1.20 | 293 | 159 | 185 | 189 | 206 | 160 | 100 | 95 | 220 | 125 | 156 | 75 | 94 | 62 | 220 | 275 | 245 | 306 | 410 | 130 | 310 | 510 | 100 | 155 | 120 | 110 | 110 | 560 | 300 | 650 | 400 | 80 | 175 | 335 |
| **2026** | 131 | 281 | 160 | 121 | 20 | 1.40 | 1.20 | 291 | 158 | 184 | 188 | 205 | 155 | 98 | 94 | 214 | 121 | 151 | 73 | 91 | 60 | 215 | 269 | 239 | 299 | 392 | 125 | 299 | 494 | 97 | 148 | 117 | 107 | 108 | 537 | 290 | 630 | 387 | 77 | 168 | 319 |
| **2027** | 127 | 272 | 155 | 117 | 19 | 1.39 | 1.19 | 289 | 157 | 182 | 186 | 204 | 149 | 95 | 92 | 207 | 117 | 146 | 70 | 88 | 58 | 209 | 261 | 233 | 291 | 373 | 120 | 288 | 477 | 94 | 141 | 114 | 104 | 105 | 514 | 280 | 610 | 374 | 73 | 160 | 303 |
| **2028** | 123 | 262 | 150 | 113 | 18 | 1.38 | 1.18 | 287 | 156 | 181 | 185 | 202 | 143 | 93 | 90 | 200 | 112 | 140 | 67 | 84 | 56 | 203 | 254 | 227 | 284 | 354 | 114 | 276 | 460 | 91 | 134 | 110 | 101 | 102 | 491 | 270 | 590 | 360 | 69 | 152 | 287 |
| **2029** | 119 | 253 | 145 | 109 | 17 | 1.38 | 1.18 | 284 | 154 | 179 | 183 | 200 | 138 | 90 | 88 | 194 | 108 | 135 | 65 | 81 | 54 | 198 | 248 | 221 | 276 | 336 | 109 | 265 | 444 | 88 | 127 | 107 | 98 | 100 | 468 | 260 | 570 | 347 | 65 | 144 | 271 |
| **2030** | 115 | 244 | 140 | 105 | 16 | 1.37 | 1.17 | 282 | 153 | 178 | 182 | 199 | 132 | 88 | 86 | 187 | 103 | 129 | 62 | 78 | 51 | 192 | 240 | 215 | 269 | 317 | 103 | 254 | 427 | 85 | 120 | 104 | 95 | 97 | 445 | 250 | 550 | 334 | 61 | 136 | 255 |
| **2031** | 111 | 234 | 135 | 101 | 15 | 1.36 | 1.16 | 280 | 152 | 176 | 180 | 197 | 126 | 85 | 84 | 180 | 99 | 124 | 59 | 74 | 50 | 186 | 233 | 209 | 261 | 298 | 98 | 242 | 410 | 82 | 113 | 100 | 92 | 94 | 422 | 240 | 530 | 320 | 58 | 129 | 239 |
| **2032** | 107 | 225 | 130 | 97 | 14 | 1.36 | 1.16 | 277 | 151 | 175 | 179 | 195 | 121 | 83 | 82 | 174 | 94 | 118 | 56 | 70 | 48 | 180 | 225 | 203 | 254 | 280 | 93 | 231 | 394 | 79 | 106 | 97 | 89 | 92 | 399 | 230 | 510 | 307 | 54 | 121 | 223 |
| **2033** | 103 | 216 | 125 | 93 | 14 | 1.35 | 1.15 | 275 | 149 | 173 | 177 | 194 | 115 | 80 | 80 | 167 | 90 | 113 | 54 | 68 | 45 | 175 | 219 | 197 | 246 | 261 | 87 | 220 | 377 | 76 | 99 | 94 | 86 | 89 | 376 | 220 | 490 | 294 | 50 | 113 | 206 |

| ← Date of Commencement (see section 4.2.6) | Commercial Residential | | Culture & Entertainment | | | Data Centres | | Healthcare | | | | | Higher Ed. | Homes | | Hotels | Offices (either /GIA or /NIA metrics may be used) | | | | | | | Retail | | | | | | Schools | | | Science & Technology | Sport & Leisure | | | Storage & Distribution | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Student resi. | Care homes | Performance | Collection | Archives | Low utilisation | High utilisation | Acute Trust | Care Trust | Community Trust | Mental health & Learning Trust | Ambulance Trust | - | Single family homes | Flats | | General - Whole building | | General - Landlord-only route | | General - Tenant-only route | Call Centres | | Trading Floors | Supermarket | High street retail, dept. store | F&B without catering [a] | F&B with catering [b] | Landlord Area Within Commercial/Shopping Centres[c] | Retail warehouse | Early years | Primary | Secondary incl. SEN | - | Dry | Wet | Fitness | Unconditioned storage | Conditioned storage | Cold store |
| | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | PUE | PUE | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²NIA/yr | kWh/m²GIA/yr | kWh/m²NIA/yr | kWh/m²NIA/yr | kWh/m²GIA/yr | kWh/m²NIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²CPA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr |
| **2034** | 99 | 206 | 120 | 89 | 13 | 1.34 | 1.14 | 273 | 148 | 172 | 176 | 192 | 109 | 78 | 78 | 160 | 85 | 106 | 51 | 64 | 42 | 169 | 211 | 191 | 239 | 242 | 82 | 208 | 360 | 73 | 92 | 90 | 83 | 86 | 353 | 210 | 470 | 280 | 46 | 105 | 190 |
| **2035** | 95 | 197 | 115 | 85 | 12 | 1.34 | 1.14 | 270 | 147 | 170 | 174 | 190 | 104 | 75 | 76 | 154 | 81 | 101 | 49 | 61 | 40 | 163 | 204 | 185 | 231 | 224 | 76 | 197 | 344 | 70 | 85 | 87 | 80 | 84 | 330 | 200 | 450 | 267 | 42 | 97 | 174 |
| **2036** | 91 | 188 | 110 | 81 | 11 | 1.33 | 1.13 | 268 | 146 | 169 | 173 | 189 | 98 | 73 | 74 | 147 | 76 | 95 | 46 | 58 | 37 | 157 | 196 | 179 | 224 | 205 | 71 | 186 | 327 | 67 | 78 | 84 | 77 | 81 | 307 | 190 | 430 | 254 | 39 | 90 | 158 |
| **2037** | 87 | 178 | 105 | 77 | 10 | 1.32 | 1.12 | 266 | 144 | 167 | 171 | 187 | 92 | 70 | 72 | 140 | 72 | 90 | 43 | 54 | 36 | 152 | 190 | 173 | 216 | 186 | 66 | 174 | 310 | 64 | 71 | 80 | 74 | 78 | 284 | 180 | 410 | 240 | 35 | 82 | 142 |
| **2038** | 83 | 169 | 100 | 73 | 9 | 1.32 | 1.12 | 263 | 143 | 166 | 170 | 185 | 87 | 68 | 70 | 134 | 67 | 84 | 40 | 50 | 34 | 146 | 183 | 167 | 209 | 168 | 60 | 163 | 294 | 61 | 64 | 77 | 71 | 76 | 261 | 170 | 390 | 227 | 31 | 74 | 126 |
| **2039** | 79 | 160 | 95 | 69 | 8 | 1.31 | 1.11 | 261 | 142 | 164 | 168 | 184 | 81 | 65 | 68 | 127 | 63 | 79 | 38 | 48 | 31 | 140 | 175 | 161 | 201 | 149 | 55 | 152 | 277 | 58 | 57 | 74 | 68 | 73 | 238 | 160 | 370 | 214 | 27 | 66 | 110 |
| **2040** | 75 | 150 | 90 | 65 | 7 | 1.30 | 1.10 | 258 | 140 | 162 | 166 | 182 | 75 | 62 | 66 | 120 | 58 | 73 | 35 | 44 | 29 | 134 | 168 | 155 | 194 | 130 | 49 | 140 | 260 | 55 | 50 | 70 | 65 | 70 | 215 | 150 | 350 | 200 | 23 | 58 | 93 |
| **2050** | 75 | 150 | 90 | 65 | 7 | 1.30 | 1.10 | 258 | 140 | 162 | 166 | 182 | 75 | 62 | 66 | 120 | 58 | 73 | 35 | 44 | 29 | 134 | 168 | 155 | 194 | 130 | 49 | 140 | 260 | 55 | 50 | 70 | 65 | 70 | 215 | 150 | 350 | 200 | 23 | 58 | 93 |

[a] i.e. only cold/hot drinks or cold food, no on-site kitchen

[b] e.g., restaurant, pub, fast food with on-site food preparation / catering

[c] this is only for use in commercial centres / shopping centres, to create area-weighted whole building limits, using the landlord areas and retail mix

*Table OE-4 Limit on annual space heating delivered to the building, New Buildings*

| ← Date of Commencement (see section 4.2.6) | Commercial Residential | | Culture & Entertainment | | | Data Centres | | Healthcare | | | | | Higher Ed. | Homes | | Hotels | Offices (either /GIA or /NIA metrics may be used) | | | | | | | | Retail | | | | | | Schools | | | Science & Technology | Sport & Leisure | | | Storage & Distribution | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Student resi. | Care homes | Performance | Collection | Archives | Low utilisation | High utilisation | Acute Trust | Care Trust | Community Trust | Mental health & Learning Trust | Ambulance Trust | - | Single family homes | Flats | - | General - Whole building | | General - Landlord-only route | | General – tenant-only route | Call Centres | | Trading Floors | | Supermarket | High street retail, dept. store | F&B without catering [a] | F&B with catering [b] | Landlord Area Within Commercial/Shopping Centres [c] | Retail warehouse | Early years | Primary | Secondary incl. SEN | - | Dry | Wet | Fitness | Unconditioned storage | Conditioned storage | Cold store |
| | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | PUE | PUE | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²NIA/yr | kWh/m²GIA/yr | kWh/m²NIA/yr | kWh/m²NIA/yr | kWh/m²GIA/yr | kWh/m²NIA/yr | kWh/m²GIA/yr | kWh/m²NIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²CPA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr | kWh/m²GIA/yr |
| **All** | 15 | 15 | No limit in this version of the Standard. Limit in subsequent versions to be confirmed | | | n/a | n/a | No limit in this version of the Standard. Limit in subsequent versions to be confirmed | | | | | | 20 | 15 | No limit in this version of the Standard. Limit in subsequent versions to be confirmed | | | | | | | | | | | | | | | | | | | | | | | | | | |

[a] i.e. only cold/hot drinks or cold food, no on-site kitchen
[b] e.g., restaurant, pub, fast food with on-site food preparation / catering
[c] this is only for use in commercial centres / shopping centres, to create area-weighted whole building limits, using the landlord areas and retail mix

*NOTE Tables for annual space heating for existing buildings, annual space cooling limits for all buildings, and peak energy demand limits for all buildings to be added to future versions of the Standard.*

# A3 On-site renewable electricity generation targets

To be used in conjunction with section 5.3 of the Standard.

*Table RE-1 On-site renewable electricity generation targets*

| | |
|---|---|
| **A. Scotland** | • for Single Family Homes, and single-storey Storage and Distribution: minimum **60 kWh/m$^2$** building footprint/year<br>• for all other building types: minimum **30 kWh/m$^2$** building footprint/year |
| **B. Middle and North England, Northern Ireland, Wales** | • for Single Family Homes, and single-storey Storage and Distribution: minimum **65 kWh/m$^2$** building footprint/year<br>• for all other building types: minimum **40 kWh/m$^2$** building footprint/year |
| **C. South England*** | • for Single Family Homes, and single-storey Storage and Distribution: minimum **75 kWh/m$^2$** building footprint/year<br>• for all other building types: minimum **45 kWh/m$^2$** building footprint/year |

*For clarity, counties that are included here are: Bedfordshire, Berkshire, Bristol, Buckinghamshire, Cambridgeshire, City of London, Cornwall, Devon, Dorset, East Sussex, Essex, Gloucestershire, Greater London, Hampshire, Hertfordshire, Isle of Wight, Kent, Norfolk Oxfordshire, Somerset, Suffolk, Surrey, West Sussex, Wiltshire.

*NOTE 1 As well as meeting the on-site renewable electricity generation targets, there is a limit on the upfront carbon of renewable electricity generation systems, see section 5.1.6.4 and Annex A1.*

*NOTE 2 Building footprint is defined in section 5.3.2.*

# A4 Refrigerant GWP limits

To be used in conjunction with Section 5.9 of the Standard

All buildings: GWP limit for refrigerant systems = 677 $kgCO_2e/kg$.

*NOTE This limit corresponds with the value provided for R-32 in "Greenhouse gas reporting: conversion factors 2025," published 10 June 2025 (therein, R-32 is referred to as HFC 32, chemical name chlorofluoromethane, $CH_2F_2$). If this value changes in future versions of this publication, the GWP limit for the Standard will also change.*

# Annex B: Submission proforma

To download the Excel-based submission proforma, please visit https://www.nzcbuildings.co.uk

# Annex C: Other schemes and standards deemed to satisfy one or more requirements of the Standard

## C1 Introduction

The Standard permits the use of other schemes and standards, that are deemed to satisfy one or more requirements of the Standard. This annex gives details of which schemes and standards may be used, along with any specific requirements that must be met in order to make use of those schemes and standards.

Section C2 also sets out the principles that NZCBS Ltd uses to determine if a potential scheme or standard satisfies requirements of the Standard.

### C1.1 Relevance of this annex

This annex is primarily intended for claimants who wish to demonstrate conformity with the Standard by using an external assessment scheme that is recognised within section C3. It may also be relevant to representatives of other built environment standards or rating schemes seeking alignment of their scheme with the Standard.

## C2 Process for schemes and standards seeking inclusion in this annex

NZCBS Ltd will deem alternative schemes and standards as satisfying one or more of the requirements of the Standard where their performance criteria, reporting outputs and verification processes are considered to be equivalent to those of the Standard, across one or more:

- building types;
- works types;
- sectors.

Enquiries on the process for achieving inclusion in this annex should be sent to NZCBS Ltd at info@nzcbuildings.co.uk.

It is the Standard's aspiration to minimise additional administration and verification procedures, therefore recognising alignment is an area of ongoing collaborative work. NZCBS Ltd welcomes engagement from other organisations and will periodically review and, where appropriate, add new further schemes and standards to this annex through future revisions.

# C3 Alternative schemes and standards deeming to satisfy

Table C-1 lists alternative schemes and standards that may be used to satisfy requirements of the Standard, and the associated conditions that **shall** be met.

Except where stated otherwise in this annex, all other requirements of the Standard **shall** be met.

*Table C-1 Schedule of alternative schemes and standards deemed to satisfy requirements of the Standard*

| Scheme/standard | Limitations | Requirement(s) satisfied | Conditions |
|---|---|---|---|
| *NABERS UK* | Building type: All<br>Works type: N/A<br>Sectors: Offices[a] | Section 5.2.7.1 Operational energy limits and pass/fail requirements | See section C3.1 |
| *Passivhaus* | Building type: All<br>Works type: N/A<br>Sectors: Those covered under *Passivhaus* | Annex E2.3 Operational energy use measurement<br>Annex E2.4 On-site renewable electricity generation<br>Annex E2.8 Space heating and cooling delivered to the building[b] | See section C3.2 |

[a] Where ≥90% of the floor area is classified as Office under section 4.2.2
[b] Note that all three of these sections relate to Annex E for PC-on-track verified checks

*NOTE It is the aspiration to add further schemes and standards to Table C-1 in the future.*

## C3.1 Conditions for using NABERS UK to satisfy requirements of the Standard

*NABERS UK* certified buildings are deemed to satisfy the requirement(s) of the Standard shown in Table C-1 where:

- The building achieves at least the star rating specified in Table C-1 , in accordance with *NABERS UK*, but with the EUI scope including any electricity used by the building that was generated by on-site renewables; and
- The claimant calculates and submits the operational energy limit that would have otherwise been applicable for the building type (see section 4.2.1), using the limits in Table OE-1 (for New Buildings) or Table OE-2 (for Existing Buildings) in Annex A, and where necessary using Equation 1b (see section 4.2.5.2) for buildings with both new and existing floor area.

*NOTE 1 For Existing Buildings, the second bullet point assumes a 'one-go' approach and therefore no retrofit plan is required to be submitted.*

*NOTE 2 The operational energy limit submitted under the second bullet point does not need to be met.*

*Table C-1 NABERS UK star rating requirements*

| Building type | Sector | Date of Commencement | Minimum star rating |
|---|---|---|---|
| New | Offices | 2026-2030 | 5★ |
| | | 2031-2035 | 5.5★ |
| Existing | Offices | 2026-2030 | 4.5★ |
| | | 2031-2035 | 5★ |

For details on Date of Commencement, see section 4.2.6

## C3.2 Conditions for using Passivhaus to satisfy requirements of the Standard

*Passivhaus* certified buildings are deemed to satisfy the requirement(s) of the Standard shown in Table C-1 where:

- The building achieves full Passivhaus certification (either 'Classic', 'Plus', or 'Premium'), assessed against the "*Criteria for the Passive House, EnerPHit and PHI Low Energy Building Standards Version 10c*" or later versions;
- The scope of the Passivhaus assessment matches that of section 5.2.1 and 5.3.1;
- Scenario testing is undertaken to match section E2-5.2.3.1 (see Annex E2.3), including as a minimum:
  - One mid-range scenario; and
  - One higher-end scenario; and
  - One lower-end scenario;
- The following is submitted to the verifier:
  - A copy of the final Passivhaus certificate and the building documentation from the Passivhaus certifier;
  - A separate calculation (e.g. using the Passivhaus Trust reporting tool) to show that the building mid-range scenario meets the EUI limit (see Annex A);
  - Where the building achieves Passivhaus Plus or Classic, also submit a separate calculation to show that the modelled renewable energy generation for the central (expected) scenario meets the renewable electricity target (see Annex A);
  - Evidence to demonstrate that metering and submetering has been installed and commissioned, as per the provided metering plan/schematic (this should be aligned to *TM54* end-use categories);
  - Part L Building Logbook;
  - Building Control Part L sign off.

# Annex D: Roles and responsibilities (for information)

Delivery to this Standard will require the involvement of a number of professionals and experts. The likely roles and responsibilities for the Standard are listed below which include precedent roles drawn from industry standards:

*Table 20 Roles and responsibilities*

| Role | Responsibility |
|---|---|
| Claimant | The Claimant will be the entity, individual or organisation, commissioning and funding the building, directly or indirectly and/or the owner of the building/leased space. They will commission the services of all individuals and services required to deliver conformity to the Standard. They will retain ownership of the Net-Zero Aligned Building claim and will be the named entity on NZCBS reporting material as the 'claimant'. |
| NZCBS Ltd | Develops, operates and maintains the Standard. Appoints and oversees the work of the Verification Administrator (VA). Registers claimants, and awards certificates and comms material upon successful verification. |
| Verification Administrator | Oversees, operates, maintains and continuously improves the UK NZCBS verification scheme. This includes:<br>• Training and accrediting verifiers;<br>• Quality assurance and auditing for verifications. |
| Net Zero Carbon Coordinator | This is not a mandatory role within the Standard, however it is recommended that a Net Zero Carbon Coordinator is appointed by the Claimant, who is responsible for advising and steering the claimant and wider design team on conformity against the Standard's processes and technical requirements, and will likely be responsible for collating and submitting reporting data for verification. It is recommended that they are appointed from the earliest stages of design, to maximise the chances of the building being able to meet the Standard.<br>The Net Zero Carbon Coordinator is likely to be someone from within the Design Team, although it does not have to be. The role may be filled by different people across the project life cycle based on varying levels of detail within the design, construction and operation of the building. (similar to the Principal Designer role within Construction, Design and Management Regulations 2015). The role should be filled by a suitably qualified professional with the following characteristics and qualifications:<br>1. Current relevant experience working within a multi-disciplinary design team; |

| | |
|---|---|
| | 2. Demonstrate industry knowledge of the key components and characteristics of the Standard, specifically operational energy (and other associated operational limits) and life cycle embodied carbon performance, as well as the design and building operation performance decisions that affect high performance ;<br>3. An excellent communicator who can translate difficult technical requirements and outcomes across different disciplines, and who can co-ordinate within the project team and to other internal and external stakeholders;<br>4. Does not need to be a technical specialist that has ability within carbon and energy assessments, e.g., detailed operational energy modelling (as these design activities can be done by others within the design team), interfacing with the Project Team is therefore essential. |
| Whole Life Carbon Assessor | The Standard requires life cycle embodied carbon to be calculated at various stages and for various building/work types as detailed in section 5. This will require the claimant to appoint a Whole Life Carbon Assessor (WLC Assessor) to undertake a Whole-Life Carbon Assessment (WLCA) in accordance with the *RICS PS*.<br>There are currently no compulsory requirements for the WLC assessor qualifications or experience within this Standard, however this is subject to change following appointment of verification administrators (See section 6). Therefore, the claimant should seek assurance that the WLC assessor appointed has the skills and experience required to deliver on their project. However, it is recommended that the WLC assessor skills/experience include:<br>• In line with section 1.4.4 of the *RICS PS*, it is expected that most WLC assessors will either undertake assessments using the *RICS PS* directly or by using software tools that function in compliance with its methodology;<br>• Experience of advising design teams, contractors and other stakeholders on how to reduce upfront carbon and life-cycle embodied carbon. |
| Building Performance Manager/Data Collator | The Standard is fundamentally a performance-based standard. As part of conformity and eventual verification to the Standard, a wide range of in-use operational data is required to be collected, recorded and reported (e.g., energy use intensity, renewable electricity generation, F-gas, heating & cooling demand etc).<br>This will require a Building Performance Manager/Data Collator to be appointed by the claimant to collate this data, accurately and in line with the standard requirements in the operation of the building. There are currently no compulsory requirements for the Building Performance Manager/Data Collator qualifications or experience within the Standard, and therefore the claimant should seek assurance that they have skills and experience required to |

| | |
|---|---|
| | accurately monitor, collect and report in-use performance data against the Standard requirements. |
| Designer | The combined team of architects, engineers, designers and other technical experts to support the design of the building/project. |
| Contractor | Those responsible for the construction of the building. |
| Verifier | An independent 3rd party individual – or group of individuals within one organisation – to which the claimant or Net Zero Carbon Coordinator will submit reporting data and evidence to for verification. By independent, this means the individual has not been involved in – and does not work for a company that has been involved in – the design, construction, operation of the building, nor the net zero carbon aligned building claim submission. See section 6.3 for a list of required verifier competencies. |
| Energy Assessor | The Standard is fundamentally a performance-based Standard. However as part of the design and construction/retrofit of a building, it is recommended the claimant appoint an Energy Assessor to calculate predicted in-use performance to ensure operational limits can be met, and to advise on any design changes required to meet relevant limits.<br>There are currently no compulsory requirements for the Energy assessor qualifications or experience within the Standard, and therefore the claimant should seek assurance that the Energy assessor appointed has the skills and experience required to deliver on their project. While there are currently no compulsory requirements for the assessor's qualifications or experience, it is recommended that the assessor's skills include:<br>• Ability to construct a thermal simulation in an appropriate simulation package (e.g., IES, TAS, DesignBuilder);<br>• Demonstrable experience undertaking *CIBSE TM54*, *NABERS UK* Design for Performance modelling, CIBSE 61-63 or Display Energy Certificate assessments relating to in-use energy performance;<br>• Ability to identify performance risks that are likely to emerge for the types of building, services and technology covered by their modelling. |

# Annex E: PC-on-track verified checks

## E1 Introduction

A core principle of the Standard is that in-use assessment and verification is the most robust approach to ensuring the decarbonisation of the built environment. However, it is also recognised that practical completion (of new construction or a retrofit) is an important point in a building's life, and an opportunity to assess and verify the potential performance of the building based on what has been constructed. As such, the Standard sets out 'PC-on-track' checks that may be undertaken – and verified – at practical completion in order to ascertain whether it is feasible for the building to achieve conformity with the Standard once occupied and in-use.

Where the claimant wishes to undertake PC-on-track verified performance checks, then all the requirements of this annex **shall** be met, and all other requirements of the Standard **shall** also be met except where modified by this annex.

The claimant **shall** commit to completing a full assessment and verification in accordance with sections 4.3 and 7.4.3 as soon as this becomes possible.

Sections within Annex E2 that modify the Standard are numbered "E2-a.b.c" where "a.b.c" refers to the section in the main Standard that is being modified.

*NOTE 1 E.g., section E2-2.3.4 makes modifications to clause 2.3.4 to be followed when using Annex E2 to complete PC-on-track verified checks.*

This annex **shall not** be used in certain situations, as described in the following sections:

- E2-4.2.3 Scope of whole building assessment;
- E2- 5.1.6.1 Upfront carbon limits - general;
- E2-5.2.7.1 Operational energy limits and pass/fail requirements.

*NOTE 2 Some requirements within this annex explicitly delete or change requirements from the rest of the Standard for the purposes of PC-on-track verified checks. Other requirements are new, and are additive to the other requirements of the Standard that still need to be met.*

The claimant may undertake the checks outlined in Annex E at the time of practical completion, and then go on to undertake a landlord- or tenant-only assessment and verification as part of a new submission using Annex F once the building is fully occupied. However, Annexes E and F **shall not** be combined in any other way.

*NOTE 3 E.g., there is no such thing as a 'PC-on-track tenant-only check'.*

*NOTE 4 Section 4.2.3 still applies, and so the object of the assessment is the whole site and works.*

*NOTE 5 It is recommended that any embodied carbon and operational energy predictive modelling set out in this annex commences from the earliest stages of the project, and is updated throughout the design*

*process. This Annex also sets out requirements to further update this modelling to reflect what has been built on-site. These steps seek to maximise the chances of conformity with the Standard when verification happens once the building is occupied and in-use.*

# E2 Requirements

## E2.1 General principles

### E2-4.2.3 Scope of whole building assessment

Annex E2 **shall** only be used where New Works or Retrofit Works have been completed.

The assessment **shall** be based on the most up to date data as of the Date of Practical Completion (see section 3.1.4.16).

### E2-4.2.4 Reporting periods

The measurements and predictions required in this annex **shall** be based on the Date of Practical Completion (see section 3.1.4.16).

*NOTE 1 Where limits and targets are based on dates (e.g. the Date of Commencement, see section 4.2.6), this is detailed throughout the Standard (e.g. section 5.1.6 sets requirements around which limits to select for embodied carbon).*

The Reporting Period End Point, Embodied Reporting Period and Operational Reporting Period should be estimated to gain an understanding of the future performance of the building, but are not used as part of this annex.

*NOTE 2 The reporting periods used in the Standard are not relevant to a PC-on-track verified check, because the embodied carbon assessments relate to the package of works completed at the date of Practical Completion, and the operational energy modelling are based on future occupation of the building, and the works completed to-date, rather than being tied to a specific point in time.*

### E2-4.2.7 General submission requirements

Assessment evidence for submission to the verifier **shall** include the Date of Practical Completion.

### E2-4.2.7.1 Submission to verifier

Replace reference to ‘the Submission Proforma’ with ‘the PC-on-track Submission Proforma’

*NOTE A link to the PC-on-track Submission Proforma can still be found in Annex B.*

# E2.2 Embodied carbon

#### E2-5.1.2.1 Works type scope

The scope of assessment related to embodied carbon **shall** be limited to the programme of works that has achieved practical completion at the Date of Practical Completion (see section E2-4.2.4).

The claimant should consider which previous programmes of works will be included in the full assessment (committed to be undertaken as soon as possible after completion, see section E1), and undertake assessments for those works too, to check whether they will prevent successful verification in the future.

The claimant should also consider likely future works that would be included in the full assessment, to undertake the same checks.

*NOTE 1 As the scope is limited to what has actually been built up to the Date of PC, there is no need to predict emissions for elements of the building that haven't yet been installed (such as future fit-out), or for previous programmes of works, but both are recommended.*

*NOTE 2 Section 5.1.2.2 is not amended by this annex, and thus still requires a life cycle embodied carbon assessment to be undertaken. This means Stage B-D emissions will still need predicting, but only for those works that are in-scope for the PC-on-track verified checks.*

#### E2-5.1.2.3 Life cycle embodied carbon assessment – Reportable Works

Section 5.1.2.3 **shall not** apply.

#### E2-5.1.2.4 Upfront carbon assessment scope – general

The scope of assessment **shall** include all Shell and Core works (see section 3.1.4.13).

Cat A and/or Cat B works (see sections 3.1.4.14 and/or 3.1.4.15) **shall** only be included in the scope of the assessment if the main building contract requires them to be delivered at the point of practical completion.

*NOTE 1 The Standard requires the above to include all abortive works, replacement of speculative interior finishes, condemned works and rectification of defects.*

*NOTE 2 Inclusion (or not) of Cat A/B affects the approach to limits in section E2-5.1.6.1, which will be set to match the same scope.*

*NOTE 3 Different areas can have different scopes in this regard. E.g. A building could be 15% Storage & Distribution Shell & Core (S&C), 75% Offices S&C, 10% Offices S&C + Cat A.*

#### E2-5.1.2.5 Upfront carbon assessment scope – reportable works

Section 5.1.2.5 **shall not** apply.

#### E2-5.1.6.1 Upfront carbon limits – General

Replace all references to section 5.1.2.4 with references to section E2-5.1.2.4.

Instead of using Whole Building limits, the limits taken from Annex A shall match the scope of the assessment undertaken in section E2-5.1.2.4.

*NOTE 1 E.g., If the assessment scope is Shell and Core + Cat A (due to Cat B not being required in the main building contract), then the limits used must also be for Shell and Core + Cat A. See note 4 below regarding situations where no such limits exists.*

Where section E2-5.1.2.4 results in different areas of the buildings have different scopes of assessment, the limit **shall** be calculated using Equation 1a, treating the differently-scoped areas as equivalent to different sectors.

*NOTE 2 E.g., With the example given in note 3 of E2-5.1.2.4, a limit will be calculated with 15% Storage & Distribution S&C, 75% Offices S&C, 10% Offices S&C + Cat A. The three different limits are all taken from Annex A, and each inserted into Equation 1a in place of the symbol $L_X$. This can then also be combined with Equation 1b if needed to cover new and existing floor areas.*

At least 70% of the building NIA **shall** be of a sector and works type that has a corresponding limit. The remainder, for which there is no corresponding limit, **shall** be excluded from the scope of the PC-on-track verified check. If there is no corresponding limit for at least 70% of the building NIA, Annex E2 **shall not** be used.

*NOTE 3 E.g., PC-on-track verified checks can still be undertaken for a building that is 70% Offices and 30% Retail, completed to Shell and Core only at Practical Completion (even though the Retail sector does not have any Shell and Core limits in this version of the Standard) by comparing the Office area to the Office limit.*

*NOTE 4 The 70% rule builds on the requirement in section 4.2.2 that at least 70% of the building NIA must be classifiable according to a sector from this Standard. If more than 30% of the NIA can't be compared with a limit (for example because the building hasn't been fully fitted out, and is of a sector type where only a Whole Building limit exists), it is impossible to use Annex E2.*

## E2.3 Operational energy

#### E2-5.2.1.1 Building type scope

Instead of being measured, operational energy **shall** be predicted in accordance with section E2-5.2.3.1.

#### E2-5.2.3.1 Operational energy use measurement

The energy types in Table 11 **shall** be predicted in accordance with *TM54*, subject to the following requirements:

- Modelling **shall** reflect what has been constructed as of the Date of Practical Completion;
- Scenario testing **shall** be undertaken in accordance with *TM54* Step 14, including as a minimum:
  - One mid-range scenario; and
  - One higher-end scenario; and
  - One lower-end scenario;
- Scenario testing **shall** account for any realistic uncertainty in building use;
- Where Design for Performance (DfP) pathway under *NABERS UK* has been used to undertake a whole-building assessment to satisfy TM54, the modelled energy use results and associated DfP report **shall** be used, and predictions made by any other methods **shall** be disregarded. DfP assessments **shall** be whole-building.

*NOTE 1 Scenario testing example: Speculative Storage and Distribution could range in use from unconditioned storage to cold storage and so will need both extremes of use considering in the testing.*

*NOTE 2 DfP assessments cannot just be landlord/base building, as this would not be comparable with the whole-building limits referenced by section 5.2.7.1.*

#### E2-5.2.4 Assessed period

Section 5.2.4 **shall not** apply.

#### E2-5.2.6 Submission requirements

Assessment evidence and reporting for submission to the verifier **shall** also include the following:

- A completed *TM54* Annex A: Implementation Matrix;
- A report following *TM54* Annex B: Outline Report Headings;
- Building airtightness test certificate and report;
- Evidence to demonstrate that metering and submetering has been installed and commissioned, as per the provided metering plan/schematic (this should be aligned to *TM54* end-use categories);
- Heating/cooling commissioning reports showing flow temperature set points and control set up;
- Ventilation commissioning showing measured flow rates at all fans and air handling units and demonstration of control, and copies of any ventilation commissioning information submitted to Building Control;
- Part L Building Logbook;
- Building Control Part L sign off.

If the higher-end scenario calculated in section E2-5.2.3.1 exceeds the operational energy limit (see section 5.2.6), the assessment evidence and reporting **shall** also include details of mitigation measures, with calculations to demonstrate that such measures will ensure energy use remains within the limit. These details **shall** also be made available to the building operator.

#### E2-5.2.7.1 Operational energy limits and pass/fail requirements

Instead of the scope of the comparison being according to section 5.2.1.2, it **shall** be to the mid-range scenario in section E2-5.2.3.1.

For Existing Buildings, the 'One-Go Retrofit' limits **shall** be used, and the 'stepped route' limits **shall not** be used.

## E2.4 On-site renewable electricity generation

#### E2-5.3.1.1 Building type scope

Instead of being measured, on-site renewable electricity generation **shall** be predicted in accordance with section E2-5.2.3.1 (i.e. whole building energy modelling or dedicated software modelling as allowed by *TM54*), or alternatively using installers' estimated yield reports from commissioning.

*NOTE TM54 allows on-site renewable electricity to be modelled separately with dedicated software.*

#### E2-5.3.4 Submission requirements

Assessment evidence and reporting for submission to the verifier **shall** also include the following:

- Commissioning certificates confirming installed capacity (kWp) and efficiency, and modelled annual output (kWh/annum), of all on-site renewable electricity generation equipment;
- Evidence to demonstrate that metering and submetering has been installed and commissioned;
- If the renewable electricity target is reduced to equal the building's in-scope annual operational electricity use (see section E2-5.3.5.1), submit details to demonstrate the feasibility of installing further capacity in the future. This **shall** evidence that the potential future increased capacity calculated in section E2-5.3.5.1 can be met. It **shall** also evidence either (a) that sufficient capacity already exists in the building's structure to support the weight of this, or (b) how additional strengthening can be introduced in the future to provide such capacity.

#### E2-5.3.5.1 On-site renewable electricity generation targets

The mid-range scenario renewable electricity generation calculated in E2-5.2.3.1 **shall** meet or exceed the target given in Annex A3 for the building location.

If reducing the target to equal the building's in-scope annual operational electricity use, this **shall not** be based on section 5.2.1.2. Instead, the reduction **shall** comply with the following requirements:

- The installed capacity **shall** exceed the lower-end scenario calculated in E2-5.2.3.1;
- A potential future increased capacity **shall** be calculated based on the lower of:
  - The higher-end scenario calculated in E2-5.2.3.1;
  - The on-site renewable electricity generation target given in Annex A3 for the building location.

*NOTE The final requirement above supports the final requirement of section E2-5.3.4, and so is used to ensure that the structural capacity of a building is sufficient (or can be made sufficient, through strengthening) to carry the weight of any additional renewable electricity generation equipment that may be needed, should the potential future increased capacity need to be realised.*

## E2.5 Operational water use

**E2-5.4.1 Scope**

Section 5.4.1 **shall not** apply

**E2-5.4.2 Metrics**

Section 5.4.2 **shall not** apply

**E2-5.4.3 Assessment methodology**

Section 5.4.3 **shall not** apply

**E2-5.4.4 Assessed period**

Section 5.4.4 **shall not** apply

**E2-5.4.5 Submission requirements**

Instead of the list in section 5.4.5, assessment evidence and reporting for submission to the verifier **shall** include the following:

- Evidence to demonstrate that metering and submetering has been installed and commissioned.

## E2.6 Electricity demand management

**E2-5.6.1 Scope**

Section 5.6.1 **shall not** apply

**E2-5.6.2 Metrics**

Section 5.6.2 **shall not** apply

#### E2-5.6.3 Assessment methodology

Section 5.6.3 **shall not** apply

#### E2-5.6.4 Assessed period

Section 5.6.4 **shall not** apply

#### E2-5.6.5 Submission requirements

Instead of the list in section 5.6.5, assessment evidence and reporting for submission to the verifier **shall** include the following:

- Evidence to demonstrate that metering and submetering has been installed and commissioned.

## E2.7 District heating and/or cooling networks

#### E2-5.7.2 Metrics

The reporting metrics in Table 17 **shall** be ignored for the PC-on-track verified checks.

*NOTE The pass/fail metrics in the table are still required.*

#### E2-5.7.3.1 Heat/coolth measurement

Instead of being measured, heat/coolth supplied by DHCNs **shall** be predicted as part of the modelling required by section E2-5.2.3.1.

#### E2-5.7.3.2 Carbon emissions factor calculation

Instead of using data coinciding with the assessed period, the calculation **shall**:

- Use the most recently available data if the DHCN is already in operation, and the carbon emissions factor is not expected to change before the building reaches minimum occupancy (see section 5.2.5.1);
- Otherwise, use projected emissions factors and proposed details for the date when minimum occupancy is expected to be achieved.

#### E2-5.7.5 Submission requirements

Remove requirements around submission of energy use and carbon emission details. Retain requirements related to carbon content for heat/coolth supplied.

The submission **shall** include evidence to demonstrate that metering and submetering has been installed and commissioned.

#### E2-5.7.6.1 DHCN limits – general

Instead of the scope of the comparison being according to section 5.7.1.1, it **shall** be to section E2-5.7.1.1, and **shall** use the carbon emissions factors calculated according to section E2-5.7.3.2.

# E2.8 Space heating and cooling delivered to the building

#### E2-5.8.1.1 Building type scope

The scope **shall** exclude all building types without limits in Annex A.

*NOTE This means that reporting at this stage is required only for buildings that will eventually have to meet limits when fully occupied and verified.*

#### E2-5.8.3 Measurement methodology

Instead of being measured, heating and cooling delivered to the building **shall** be predicted as part of the modelling required by section E2-5.2.3.1.

#### E2-5.8.6 Submission requirements

Instead of submitting measured demand data, usage predictions **shall** be submitted as part of the submission requirements of E2-5.2.5.

The submission **shall** also include evidence to demonstrate that heat meters and submeters have been installed and commissioned. Similarly, where the heating/cooling delivered by VRF systems will be likely to be calculated based on electricity use rather than direct measurements, the submission **shall** include evidence to demonstrate that sufficient electricity metering and submetering has been installed for this.

# E2.9 Carbon offsetting

#### E2-5.10.1.1 Building and works type scope

If carbon emissions are offset, then:

- They **shall not** be reported to the verifier at this stage;
- They should be recorded in order to assist with later reporting for a full claim of conformity (see section 4.3).

*NOTE There is a risk that carbon credits purchased at this stage might not meet the requirements of the Standard by the time that verification is undertaken.*

# E2.10 Verification

#### E2-6.2.3 Timing – verification

The PC-On-Track verified check **shall** be submitted to the verifier within 6 months of the Date of Practical Completion.

# E2.11 Communication

#### E2-7.2 Dates of claim

The PC-on-track verified check **is** valid for the Date of Practical Completion only (see section E2-4.2.4), and this **shall** be clearly communicated.

A PC-on-track verified check does not refer to a period of time in the way that a full claim of conformity does (see section 4.3), and so the remainder of section 7.2 **shall** be ignored.

# Annex F: Landlord and tenant routes

## F1 Introduction

In support of the robustness and clarity of net zero claims that the Standard advocates, the preferred route to a verification is a whole-building assessment. However, where this is not reasonably practicable, the Standard allows the use of approaches specific to a landlord or tenant wishing to pursue conformity solely for their part of a building.

A landlord or one or more tenants of a building may each pursue conformity and verification independently of each other. However, each annex has been written assuming that the claimant is acting independently of others in the building.

Where the claimant is a landlord, they **shall** follow Annex F2.

Where the claimant is a tenant, they **shall** follow Annex F3.

For both Annexes F2 and F3, all other requirements of the Standard **shall** also be met, except where modified by those annexes.

Sections that modify the Standard are numbered " F2-a.b.c" or “F3-a.b.c” where "a.b.c" refers to the section in the main Standard that is being modified.

*NOTE 2 E.g., section F2-2.3.4 makes modifications to clause 2.3.4 to be followed when using Annex F2 to complete a landlord-only approach to conformity and verification.*

*NOTE 3 Some requirements within this annex explicitly delete or change requirements from the rest of the Standard for the purposes of landlord- or tenant-only assessment, reporting and verification. Other requirements are new, and are additive to the other requirements of the Standard that still need to be met.*

The claimant may undertake the checks outlined in Annex E at the time of practical completion, and then go on to undertake a landlord- or tenant-only assessment and verification, as part of a new submission using Annex F once the building is fully occupied. However, Annexes E and F **shall not** be combined in any other way.

*NOTE E.g., there is no such thing as a ‘PC-on-track tenant-only check’.*

### F1.1 Principles of delineation (for information)

The Annex F approaches vary between embodied and operational aspects, because material quantities and energy use are measured and controlled differently to each other. This section summarises the general principles that have been followed, but the detailed requirements around how materials, energy and water are divided are provided within Annexes F2 and F3.

The area under the responsibility of the claimant is defined as a ‘Delineated Area’ in both annexes. It is recognised that materials and building elements may physically extend across

boundaries, and that energy and water flows may serve areas both within and beyond the Delineated Area. Where this is the case, responsibility is assigned to the party who has the most influence over those aspects.

As such, the principles that have *generally* been followed when assigning responsibility are:

- Aspects related to material use (e.g. embodied carbon emissions, material quantities): works prior to practical completion are the responsibility of the landlord, while other works are typically allocated based on material location.
- Aspects related to operational energy and water use: centralised systems are the responsibility of the landlord, with the tenant responsible for localised small power use.
- Allowances are also made throughout the annex to allow apportionment where this can be justified.

*NOTE This section is for information only. Annexes F2 and F3 provide precise requirements related to the bullet points above.*

# F2 Landlord-only route

This annex sets out the requirements for assessment and verification of the parts of a building under the responsibility of the landlord, and where at least one tenant within the building is preventing whole-building verification from being pursued.

If the landlord is seeking to claim conformity with the Standard, then all the requirements of this annex **shall** be met, and all other requirements of the Standard **shall** also be met except where modified by this annex.

This annex **shall not** be used in certain situations, for example where no landlord-only limits exist for the building sector, as described in the following sections:

- F2-4.2 General assessment, submission and limits requirements;
- F2-5.1.6.2 Upfront carbon limits;
- F2-5.2.1.2 Operational energy assessment scope – general;
- F2-5.5 Fossil fuel free;
- F2-5.9 Refrigerants.

*NOTE At present, landlord-only limits have been derived only for the Offices sector. The intention is to extend this to additional sectors in future versions of the Standard, as and when sufficient data exists to support the derivation of robust, sector-specific limits and targets.*

# F2.1 General principles

### F2-4.2 General assessment, submission and limits requirements

Before pursuing verification under Annex F2, the claimant **shall** first establish whether a whole-building assessment is reasonably practicable by contacting all tenants in the building and requesting their participation in a whole-building assessment, allowing at least six weeks for a response. If any tenant confirms in writing that they are unwilling or unable to participate, or does not respond within the stated period, the whole-building assessment will be accepted as impracticable, and the landlord-only under Annex F2 may be pursued.

Annex F2 **shall not** be used for buildings where a single tenant is leasing the whole building under a Full Repairing and Insuring (FRI) lease.

*NOTE Where a single tenant has an FRI lease, there is no separate landlord-controlled scope to verify.*

### F2-4.2.3 Scope of assessment

The Delineated Area **shall** be defined as all areas of the building that are occupied solely by the landlord, plus all core and communal areas.

*NOTE The scope of assessment varies for different aspects of the Standard (e.g., embodied carbon, operational energy, etc.) The whole building will need to be considered in order to identify the materials and systems that are included within the scope of each aspect (e.g. F2-5.1.2 for embodied carbon, or F2-5.2.1.2 for operational energy). As such this requirement of the Standard is not modified by this annex beyond the above.*

### F2-4.2.7 General submission requirements

Assessment evidence for submission to the verifier **shall** include the following, to demonstrate the aspects of the building that are within the landlord's responsibility:

- Documents (e.g. floorplans, schematics, reports) identifying:
  - The physical boundaries of the Delineated Area, including GIA and NIA measurements;
  - The Lease Plan(s) related to all leases with tenants;
  - Marked up plans identifying materials and systems installed prior to the start of the Embodied Reporting Period (ERP, see section 3.1.2.3) that were excluded from any assessments;
  - Materials and systems installed by the landlord across areas of the building that the landlord operates and controls;
  - Materials and systems installed by the landlord across other areas of the building;
  - Systems (e.g. heating, ventilation, air conditioning, water) that the landlord controls, including those that are operated by centralised systems;

  - Submetering schematics demonstrating which systems are metered and how these correspond to the physical boundaries of the landlord's areas, along with methods used for allocation;
- Evidence of the request for whole-building assessment (see F2-4.2), and any response received (or confirmation that no response was received) shall also be submitted to the verifier.

## F2.2 Embodied carbon

**F2-5.1.2.1 Works type scope**

When following the requirements of 5.1.2.1 to 5.1.2.5, works undertaken by tenants **shall** be excluded.

Therefore, the scope of the assessment **shall** include (but is not limited to) the following:

- All works up to Practical Completion (see section 3.1.4.16) including materials and products that extend into tenant areas (such as floors and façades, or central heating and cooling systems);
- Further works undertaken after the Date of Practical Completion, such as further Cat A and B works (see 3.1.4.14 and 3.1.4.15) undertaken by the landlord, including speculatively prior to letting.

*NOTE 1 Speculative works installed by the landlord are in-scope to avoid unaccounted-for emissions.*

*NOTE 2 Requirements around Embodied Reporting Periods etc in section 5.1.2.1 limit the scope further.*

**F2-5.1.2.2 Life cycle embodied carbon assessment scope – general**

Replace all references to section 5.1.2.1 with references to section F2-5.1.2.1.

**F2-5.1.2.3 Life cycle embodied carbon assessment scope – Reportable Works**

Replace all references to section 5.1.2.2 with references to section F2-5.1.2.2.

**F2-5.1.2.4 Upfront carbon assessment scope – general**

Replace all references to section 5.1.2.2 with references to section F2-5.1.2.2.

Where Cat A and B have been completed within the Delineated Area, these **shall** be included in the scope of the main assessment, and the area(s) covered by these works **shall** be reported.

*NOTE 1 The Standard requires the above to include all abortive works, replacement of speculative interior finishes, condemned works and rectification of defects.*

*NOTE 2 E.g., if the landlord chooses to occupy a whole storey of their own building, they will likely fit this out in full. The related upfront carbon from such fit-out would be assessed, and the area of the storey would be reported in order to help set limits in section F2-5.1.6.1.*

For works undertaken since the Date of Practical Completion (see section 3.1.4.16), materials outside of the Delineated Area **shall** be excluded from the scope of the main assessment, and **shall** instead be assessed as a separate programme of Reportable Works, referred to in this annex as the Landlord Fit-Out Assessment.

*NOTE 3 To clarify, the Landlord Fit-Out Assessment is treated as a totally separate assessment of a separate programme of Works when using the proforma in Annex B, and is compared to a separate set of limits under F2-5.1.6.2.*

*NOTE 4 E.g., if the landlord chooses to fit out part of the building in order to attract tenants, or they install further MEP distribution passing into tenants' spaces, or they choose to install raised access flooring throughout the entire building following the Date of Practical Completion. These works are assessed separately to those occurring within the Delineated Area, in order that they can be checked against a different set of limits in section F2-5.1.6.1. This will require the claimant to apportion materials appropriately between the Delineated Area and the other areas based on location of those materials.*

*NOTE 5 Different areas can have different scopes, e.g. a building with 15% Storage & Distribution Shell & Core, 75% Offices Shell & Core, and 10% Offices Shell and Core plus Cat A and B (this is a hypothetical example until landlord-only operational energy limits have been added for Storage & Distribution sector).*

#### F2-5.1.2.5 Upfront carbon assessment scope – Reportable Works

Replace all references to sections 5.1.2.3 and 5.1.2.4 with references to section F2-5.1.2.3 and F2-5.1.2.4.

#### F2-5.1.2.6 Upfront carbon assessment scope – generic material specifications

Replace all references to sections 5.1.2.4 and 5.1.2.5 with references to section F2-5.1.2.4 and F2-5.1.2.5.

#### F2-5.1.5 Submission requirements

Where materials have been split between the Delineated Area and other areas, calculations **shall** be included to show how emissions are apportioned.

#### F2-5.1.6.1 Upfront carbon limits – general

Replace all references to section 5.1.2.4 with references to section F2-5.1.2.4.

Instead of using Whole Building limits, the limits taken from Annex A shall match the scope of the assessment undertaken in section F2-5.1.2.4.

*NOTE 1 E.g., If the assessment scope is Shell and Core only (due to the landlord only having responsibility for core and communal areas), then the limits used must also be for Shell and Core.*

Where section F2-5.1.2.4 results in different areas within the Delineated Area having different assessment scopes, the limit **shall** be calculated using Equation 1a, treating each individual area as equivalent to each corresponding sector and scope.

*NOTE 2 E.g., With the example given in Note 3 of F2-5.1.2.4, a limit will be calculated with 15% Storage & Distribution S&C, 75% Offices S&C, 10% Offices Whole-Building. The three different limits are all taken from Annex A, and all inserted into Equation 1a in place of the symbol $L_x$. This can also be combined with Equation 1b if needed to cover new and existing floor areas.*

At least 70% of the NIA of the Delineated Area **shall** be of a sector and works type that has a corresponding limit – if this is not the case, Annex F2 **shall not** be used.

*NOTE 3 As is the case within section 4.2.2 (where up to 30% of the NIA can be unclassifiable), the whole of the Delineated Area is still compared to the limit determined for the rest of the building.*

*NOTE 4 E.g., A building that is 70% Offices and 30% Retail, and that has no Cat B in the Delineated Area, can still be verified using Annex F2 (even though a 'Shell and Core plus Cat A' limit does not exist for Retail) by comparing the whole of the Delineated Area to the Office limit.*

*NOTE 5 If more than 30% of the NIA can't be compared to a limit (for example because the building is a sector type where only a whole-building limit exists in Annex A, but the landlord's area is not fully fitted out), it is impossible to use Annex F2.*

#### F2-5.1.6.2 Upfront carbon limits – Reportable Works

Where section F2-5.1.2.4 requires a Landlord Fit-Out Assessment to be undertaken for materials outside of the Delineated Area, these **shall** be compared to a separate limit based on their own scope (i.e. Cat A + B, or Cat B only).

## F2.3 Operational energy

#### F2-5.2.1.2 Operational energy assessment scope – general

The scope **shall** exclude the following energy uses where submetering allows measurements to be taken to subtract them from the building's total energy use, and where the tenants' spaces they serve meet the Standard's minimum occupancy rates (see section 5.2.5.1):

- Plug loads in occupied tenants' spaces (e.g., small power such as IT equipment, tenant kitchen water heating, drink stations, and power for any localised supplementary heating, cooling, ventilation systems, water heating etc);
- Lighting within occupied tenants' spaces;
- ICT systems within occupied tenants' spaces (e.g., server rooms).

All other energy **shall** be included within the scope, including energy used in tenants' spaces by central landlord powered heating and cooling systems (e.g., power for FCU motors, perimeter heating).

Annex F2 **shall not** be used for buildings where a centralised HVAC system – providing heating, cooling, ventilation, or outside air to multiple spaces or tenancies within the building – is not present.

#### F2-5.2.5 Occupancy rate

In Equation 4, all areas **shall** consider only the Delineated Area.

#### F2-5.2.6 Submission requirements

The claimant **shall** provide clear evidence, such as metering data, schematics, or contractual documents, to show how energy use has been assigned to the landlord.

#### F2-5.2.7.1 Operational energy limits and pass/fail requirements

The relevant 'landlord-only route' limit in tables OE-1 to OE-3 **shall not** be exceeded.

Instead of the scope of the comparison being according to section 5.2.1.2, it **shall** be to section F2-5.2.1.2.

The EUI **shall** be calculated based on the whole GIA or NIA of the building, for comparison to the EUI limit.

#### F2-5.2.7 Retrofit Plans

Retrofit plans **shall** include interventions affecting energy use in-scope in section F2-5.2.1.2, but may also include other required interventions. Where tenant energy use is referenced, it **shall** be evidenced that these are grounded in lease terms or clear contractual obligations.

*NOTE Lease terms or contractual obligations would need to be shown for situations such as the landlord assuming certain tenant operating hours that will affect future central plant performance, or the landlord assuming future reductions in tenant plug loads.*

## F2.4 On-site renewable electricity generation

#### F2-5.3.1.2 On-site renewable electricity generation assessment scope – general

The scope **shall** exclude systems installed and controlled by tenants.

The scope **shall** include shared systems, where the landlord is responsible for operation, maintenance and control.

## F2.5 Operational water use

#### F2-5.4.1.2 Operational water use assessment scope – general

Water used by tenants in facilities located in tenants' areas (e.g. toilets within a tenant's demise), may be excluded from scope where submetering allows.

*NOTE 1 Where no submetering exists, all water use in the building will need to be assessed.*

*NOTE 2 Water used in shared facilities is still in-scope.*

## F2.6 Fossil fuel free

**F2-5.5 Fossil fuel free**

Section 5.5 applies in full for all systems controlled by the landlord.

Tenants in the landlord's building are exempt from needing to meet the requirements of section 5.5 where all the following is true:

- it is an Existing Building; and
- the tenants' leases were signed prior to the publication of Version 1 of this Standard (see section 4.1.2); and
- the Reporting Period End Point (RPEP, see section 4.2.4.1) is prior to 2040.

For all other tenants, section 5.5 applies in full.

## F2.7 Refrigerants

**F2-5.9 Refrigerants**

Section 5.9 applies in full for all systems controlled by the landlord.

Tenants in the landlord's building are exempt from needing to meet the requirements of section 5.9 where all the following is true:

- it is an Existing Building; and
- the tenants' leases were signed prior to the publication of Version 1 of this Standard (see section 4.1.2); and
- the Reporting Period End Point (RPEP, see section 4.2.4.1) is prior to 2040.

For all other tenants, section 5.9 applies in full.

*NOTE Section 5.9 has exemptions allowing the use of non-compliant refrigerants in other circumstances too, for example with existing systems prior to the year 2030.*

## F2.8 Carbon offsetting

**F2-5.10.1.2 Carbon offsetting scope – general**

If carbon emissions are offset and reported (see 5.10.1.1), the requirements of section 5.10 **shall** apply only to carbon emissions included within the scope of the assessment undertaken in accordance with Annex F2.

*NOTE Carbon offsetting is optional for the landlord-only route (as it is for whole-building verification to the main requirements of the Standard), but where it does take place, it must follow the requirements of sections F2-5.10.1.2.*

# F3 Tenant-only route

This annex sets out the requirements for assessment and verification of the area(s) of a building under the responsibility of the tenant, and where the landlord is preventing whole-building verification from being pursued. It assumes that the claimant is a single tenant, acting independently of any other tenants in the building.

If the tenant is seeking to claim conformity with the Standard, then all the requirements of this annex **shall** be met, and all other requirements of the Standard **shall** also be met except where modified by this annex.

This annex **shall not** be used in certain situations, for example where no tenant-only limits exist for the building sector, as described in the following sections:

- F3-4.2 General assessment, submission and limits requirements;
- F3-5.1.6.2 Upfront carbon limits;
- F3-5.2.1.2 Operational energy assessment scope – general;
- F3-5.5 Fossil fuel free;
- F3-5.9 Refrigerants.

*NOTE 2 At present, tenant-only limits have been derived only for the Offices sector. The intention is to extend this to additional sectors in future versions of the Standard, as and when sufficient data exists to support the derivation of robust, sector-specific limits and targets*

## F3.1 General principles

### F3-4.2 General assessment, submission and limits requirements

Before pursuing verification under Annex F3, the claimant **shall** first establish whether a whole-building assessment is practicable by contacting the landlord for the building and requesting the participation of them and all other tenants in a whole-building assessment, allowing at least six weeks for a response. If the landlord confirms in writing that they are unwilling or unable to participate, or does not respond within the stated period, the whole-building assessment will be accepted as impracticable, and the tenant-only approach under Annex F3 may be pursued.

Annex F3 **shall not** be used for buildings where only one tenant is leasing the building.

*NOTE 1 Where a single tenant is leasing the building, they should work with the landlord to pursue whole building verification.*

*NOTE 2 It is acceptable for multiple tenants to each individually use Annex F3 to seek their own verifications within the same building.*

### F3-4.2.3 Scope of assessment

The Delineated Area **shall** be defined as the parts of the building that are occupied solely by the tenant. The GIA area throughout the assessment shall be the GIA of the Delineated Area.

*NOTE The scope of assessment varies for different aspects of the Standard (e.g., embodied carbon, operational energy, etc.) The whole building will need to be considered in order to identify the materials and systems that are included within the scope of each aspect (e.g. F2-5.1.2 for embodied carbon, or F2-5.2.1.2 for operational energy). As such this requirement of the Standard is not modified by this annex beyond the above.*

#### F3-4.2.7 General submission requirements

Assessment evidence for submission to the verifier **shall** include the following, to demonstrate the aspects of the building that are within the tenant's responsibility:

- A Lease Plan and other documents (e.g. floorplans, schematics, reports) identifying:
  - The physical boundaries of the Delineated Area, including GIA and NIA measurements;
  - Materials and systems installed prior to the start of the assessed period for embodied carbon to be excluded from any assessments;
  - Materials and systems removed by the tenant, and details of efforts taken to reuse them in- and ex-situ;
  - Materials and systems installed by the tenant;
  - Systems (e.g. heating, ventilation, air conditioning, water) that the tenant controls, and those which affect the tenant's area but are controlled by others;
  - Systems that serve multiple tenancies (such as heating, cooling, ventilation, domestic hot water, lifts), with supporting schematics demonstrating how these correspond to the physical boundaries of the tenant's area;
  - Submetering schematics demonstrating which systems are metered and how these correspond to the physical boundaries of the tenant's areas, along with methods used for allocation.
- Evidence of the request for whole-building assessment (see F3-4.2), and any response received (or confirmation that no response was received) **shall** also be submitted to the verifier.

## F3.2 Embodied carbon

#### F3-5.1.2 Scope

When following the requirements of 5.1.2.1 to 5.1.2.5, only works undertaken by the tenant within the Delineated Area **shall** be included. This includes (but is not limited to) all Cat A and B works (see sections 3.1.4.14 and 3.1.4.15) installed by the tenant.

Where works physically extend beyond the Delineated Area, the materials beyond the Delineated Area **shall** be excluded from the scope of the assessment.

*NOTE 1 The above clause means that it's unlikely that the area used for calculations of $kgCO_2e/m^2$ is unlikely to ever be bigger than the area of the Delineated Area.*

All works undertaken prior to the Date of Practical Completion of the building (see section 3.1.4.16) and not instructed by the tenant **shall** be excluded from the scope of the assessment.

Where works have been undertaken by others that result in materials being located in the Delineated Area, these may be excluded from the scope of the assessment if it can be demonstrated that the tenant did not instruct their installation.

*NOTE 2 Other scope requirements of section 5.1.2 require the assessment of other aspects of works too, such as external works. However, the wording of F3-5.1.2 means that if these elements are not undertaken by the tenant, they are not in-scope*

**F3-5.1.2.2 Life cycle embodied carbon assessment scope – general**

Replace all references to section 5.1.2.1 with references to section F3-5.1.2.1.

**F3-5.1.2.3 Life cycle embodied carbon assessment scope – Reportable Works**

Replace all references to section 5.1.2.2 with references to section F3-5.1.2.2.

**F3-5.1.2.4 Upfront carbon assessment scope - general**

Replace all references to section 5.1.2.2 with references to section F3-5.1.2.2.

**F3-5.1.2.5 Upfront carbon assessment scope – Reportable Works**

Replace all references to section 5.1.2.3 and 5.1.2.4 with references to section F3-5.1.2.3 and F3-5.1.2.4.

**F3-5.1.2.6 Upfront carbon assessment scope – generic material specifications**

Replace the reference to section 5.1.2.4 and 5.1.2.5 with references to section F3-5.1.2.4 and F3-5.1.2.5.

**F3-5.1.5 Submission requirements**

If any works have been shared between the tenant and other parties, calculations **shall** be included to show apportionment of emissions

**F3-5.1.6.1 Upfront carbon limits-general**

Replace all references to section 5.1.2.4 with references to section F3-5.1.2.4.

At least 70% of the NIA of the Delineated Area **shall** be of a sector and works type that has a corresponding limit – if this is not possible, Annex F3 **shall not** be used.

*NOTE 1 As is the case within section 4.2.2 (where up to 30% of the NIA can be unclassifiable), the whole of the Delineated Area is still compared to the limit determined for the rest of the building.*

*NOTE 2 E.g., where a tenant is leasing a space to use as 70% Offices and 30% Retail, and completes Cat B fitout in both, they can still verify their space using Annex F3 (even though a Cat B Reportable Works limit does not exist for Retail) by comparing the in-scope emissions to the Office Cat B Reportable Works limit.*

*NOTE 3 If more than 30% of the NIA can't be compared to a limit (for example because the building is a sector type where only a whole-building limit exists in Annex A, and the tenant only undertakes Cat B fit-out), it is impossible to use Annex F3.*

## F3.3 Operational energy

#### F3-5.2.1.2 Operational energy assessment scope – general

The scope **shall** be limited to only the energy used by systems controlled solely by the tenant, including but not necessarily limited to:

- Plug loads (e.g., small power such as IT equipment, tenant kitchen water heating, drink stations, and power for any localised supplementary heating, cooling, ventilation systems, water heating etc);
- Lighting within the tenant's space;
- Local ICT systems (e.g., server rooms).

Submetering **shall** be installed to allow the measurement of the above systems' collective energy use, in order to measure this separately from that used by the landlord and other tenants.

Energy used by central landlord heating and cooling systems (e.g., power for FCU motors, perimeter heating) within the Delineated Area **shall** be excluded from scope where submetering allows separate measurement.

#### F3-5.2.5 Occupancy rate

In Equation 4, all areas **shall** consider only the Delineated Area.

#### F3-5.2.7.1 Operational energy limits and pass/fail requirements

The relevant 'tenant-only route' limit in tables OE-1 to OE-3 **shall not** be exceeded.

*NOTE Tenant-only EUI limits are only given in terms of NIA.*

Instead of the scope of the comparison being according to section 5.2.1.2, it **shall** be to section F3-5.2.1.2.

The EUI **shall** be calculated accounted for the whole GIA or NIA of the building, for comparison to the EUI limit.

#### F3-5.2.8 Retrofit Plans

Retrofit plans **shall** include interventions affecting energy use in-scope in section F3-5.2.1.2, and may also include other required interventions.

## F3.4 On-site renewable electricity generation

**F3-5.3.1.2 On-site renewable electricity generation assessment scope - general**

The scope **shall** exclude systems installed and controlled by landlords or other tenants.

The scope **shall** include shared systems, where the tenant is responsible for operation, maintenance and control.

**F3-5.3.2 Metrics**

The pass/fail metrics in Table 13 **shall** be treated as reporting metrics.

*NOTE This means that the annual on-site renewable electricity generation per $m^2$ building footprint area needs to be reported, but no limits apply.*

**F3-5.3.5 Targets and other pass/fail requirements**

Section 5.3.5 **shall not** apply.

## F3.5 Operational water use

**F2-5.4.1.2 Operational water use assessment scope – general**

If the Landlord will not allow access to the relevant water use information, and a letter from the Landlord can be submitted to the verifier confirming this, section 5.4 **shall not** apply. Otherwise:

- Water used in facilities located in the tenant's area (e.g. toilets within the tenant's demise), **shall** be included in the scope of operational water use;
- Water used in facilities located elsewhere in the building **shall** be excluded from scope where submetering allows.

*NOTE Where no submetering exists, all water use in the building will need to be assessed unless the Landlord will not allow access to such information.*

## F3.6 Fossil fuel free

**F3-5.5 Fossil fuel free**

Section 5.5 applies in full for all systems controlled by the tenant or their landlord.

Other tenants in the building are exempt from needing to meet the requirements of section 5.5 where the Reporting Period End Point (RPEP, see section 4.2.4.1) is prior to 2040. After that date, systems controlled by other tenants are also included in the scope of section 5.5.

## F3.7 Electricity demand management

Section 5.6 **shall not** apply.

# F3.8 Refrigerants

**F3-5.9 Refrigerants**

Section 5.9 applies in full for all systems controlled by the tenant or their landlord.

Other tenants in the building are exempt from needing to meet the requirements of section 5.9 where the Reporting Period End Point (RPEP, see section 4.2.4.1) is prior to 2040. After that date, systems controlled by other tenants are also included in the scope of section 5.9.

*NOTE Section 5.9 has exemptions allowing the use of non-compliant refrigerants in other circumstances too, for example with existing systems prior to the year 2030.*

# F3.9 Carbon offsetting

**F3-5.10.1.2 Carbon offsetting scope – general**

If carbon emissions are offset and reported (see 5.10.1.1), the requirements of section 5.10 **shall** apply only to carbon emissions included within the scope of the assessment undertaken in accordance with Annex F3.

*NOTE Carbon offsetting is optional for the tenant-only route (as it is for whole-building verification to the main requirements of the Standard), but where it does take place, it must follow the requirements of sections F3-5.10.1.2.*

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*With special thanks to those who contributed their expertise post Pilot launch via our Heritage Expert Review Groups.*

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*NOTE – Pilot Owner organisations are listed below. In many cases Pilot Owners were supported extensively by project design and construction teams, to which we extend our special thanks.*

**All Souls College**

**Altentic Limited**

**Amazon**

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**Barratt London**

**Baytree**

**British Antarctic Survey**

**British Land**

**Brookfield Properties**

**Bruntwood SciTech**

**Caledonian Maritime Assets Ltd**

**Cambridge City Council**

**Cambridge University**

**Cardiff City Council**

**Castleforge**

**Department for Education**

**Dorrington**

**Duke Street Property**

**Eden Project Morecambe**

**Longfellow Real Estate Partners**

**Mace**

**Andy Macintosh**

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**Meadow Partners**

**Milligan and Willmott Dixon**

**Ministry of Defence**

**Mission Street**

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**NT Property Nominees IA Limited and NT Property 1B Limited**

**Nvirohaus**

**Original Works**

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**RIBA**

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**Sainsbury's**

**Science and Technology Facilities Council**

**South Gloucestershire Council**

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**St Vincents Works Ltd**

**Stanhope Plc**

**Tesco**

**The Crown Estate**

**The Langham Estate and The Howard de Walden Estate**

**The Office Group**

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**Tom Lelyveld** – AECOM

**Sarah Linnell** – Cundall

**Peter Mayer** – Thomas Miller

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**Dylan Kenny and Niall McGowan** – Lamorbey Associates for modelling inputs

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**Diana Dina** – Haworth Tompkins
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**Oliver Heywood** – Allies and Morrison
**Ben Hopkins** – Bennetts Associates
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**Greg Hardie** – Arup
**Simon Leek** – Sir Robert McAlpine
**Philip Mannis** – Hoare Lea
**Mehdi Shahrestani** – University of Reading
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**Jorge Abarca Montero** – WSP
**Michael Sansom** – British Constructional Steelwork Association
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## Data Providers & Additional Supporters

### Data Providers

Adar Consulting
AECOM
AEW
AHMM
AHR
Anne Thorne Architects LLP
Architype Ltd
Argent LLP
Arup
Atkins
BAM
BDP
BE Design
Bennetts Associates
Big Yellow Group
Bouygues
British Land
Bruntwood
Bryden Wood
Buro Happold
BWB Consulting
B&K (Bowmer + Kirkland)
Certified
Chapmanbdsp
City of London
Commercial Services Group
Cundall
Curtins
Cushman and Wakefield
Davies Maguire
Dellavalle Architects
Derwent
dRMM
ECDA
Eckersley O'Callaghan Engineers
Eight Versa
Expedition Engineering
Fiera Real Estate
Focus Consultants
GBuild
Glenn Howells Architects
GPE
Harley Haddow
Hawkins\Brown
Haworth Tompkins
Helical PLC
Hilson Moran
Hoare Lea
Introba
ISG ltd.
Jestico + Whiles
JLL
Kirsty Maguire Architect
KJ Tait
KLH Sustainability
Knight Frank Investment Management
Lamington Group
Landsec
LEAP
Lendlease
London Legacy
Longevity Partners
Mace Group
Map Mortar
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Martin Ingham
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Nigel Dutt
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Ramboll
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Sainsbury's
Savills
Scotch Partners
SD Structures
Sir Robert McAlpine
Smith and Wallwork
Space Architects
Staffordshire University
Stantec
Sustainable Construction Services
Swansea Council
Swansea University
The Office Group (TOG)
Timber Development
Tooley Forster
Treveth Holdings LLP
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Turley
University of Liverpool
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Verco
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Walsh
Waterman Group
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Welsh School of Architecture
Whitby Wood
Wilkinson Eyre
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Woolgar Hunter
Workman
WSP
XCO2

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**Brooke Penman** - UKGBC

**Clare Murray** - Levitt Bernstein/LETI

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**Gemma White** - Overbury

**Julia Galves** - Hawkins\Brown

**Mary Costello** - LETI

**Matt Cox** - Arup

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# UK Net Zero Carbon Buildings Standard

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**Founding members:**
Better Buildings Partnership
Building Research Establishment Ltd
Chartered Institution of Building Services Engineers
Institution of Structural Engineers
Low Energy Transformation Initiative (LETI)
Royal Institute of British Architects
Royal Institution of Chartered Surveyors
UK Green Building Council

With early support from Carbon Trust

Please access our website for the latest updates and developments
nzcbuildings.co.uk
https://www.linkedin.com/company/uk-nzc-buildings-standard