UK Net Zero Carbon Buildings Standard

Pilot Version rev2

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BBP BETTER BUILDINGS PARTNERSHIP

bre

CARBON TRUST

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RIBA Architecture.com

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UK GBC

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 (UK'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. 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 reduce spurious 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 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 mandatory 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 real estate sector to stay true to the built environment's 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 mandatory 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.

The mandatory 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 complex 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	Outlines the scope, references, terms and definitions, and abbreviations used by the Standard.
Section 4. General principles	Sets out the overarching requirements of the Standard that apply across all assessments, submissions and verifications.
Section 5. Assessment, submissions and limits	Provides requirements specific to each aspect of the Standard, such as embodied carbon or operational energy.
Section 6. Verification and conformity	Summarises the intent of these sections. Whilst these sections are not provided in the Pilot version, they will be included in future versions of the Standard.
Section 7. Communication	
Annex A Limits and targets	Provides the numerical requirements of the Standard, varying by type of building, construction works, timing and sector.
Annex B Submission proforma	Standalone spreadsheet for submitting numerical evidence of conformity with the Standard for verification.
Annex C Principles of equivalence	An informative annex explaining how other built environment schemes that share an aligned approach to one or more of the Standard's mandatory metrics, targets or requirements, might propose to demonstrate equivalence with specific aspects of the Standard. This will enable the potential use of comparable schemes to demonstrate conformity for certain criteria of the Standard in the future.
Annex D Roles and responsibilities	An informative annex explaining the likely roles and responsibilities required for implementation of the Standard on a building.
Annex E Contributors	Lists all contributors involved in the development of the Standard.

Although not currently included in the Pilot Version of the Standard, it is the intention that the Standard will evolve over time to include the following aspects:

- Life cycle embodied carbon limits;
- Space heating and/or cooling limits across further sectors and building types;
- Electricity demand management limits;
- Progression of the energy performance metrics to reflect additional energy uses, or intensity of use, such as for areas currently classified as Additional Use Areas;
- Options for delineation between areas or between responsibilities (e.g., for base build or for tenanted offices to assess their performance separately);
- An update to Annex C incorporating recognised standards or schemes that can be used to demonstrate areas of equivalence.

The Standard builds on previous work in the net zero carbon field by BBP, BRE, CIBSE, IStructE, LETI, RIBA 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, the Carbon Trust, IStructE, LETI, RIBA, RICS and UKGBC with the support from industry volunteers. The Pilot version of the Standard has been reviewed by a group of more than 350 people, representing designers, architects, engineers, developers, chartered environmentalists, contractors, academics and more. 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.

The UK Net Zero Carbon Buildings Standard and its logo have been submitted for Trademark. The Standard is published and maintained by Net Zero Carbon Buildings Standard Limited, a private company limited by guarantee, incorporated in England and Wales with company number 14799563. The company will uphold all founding principles of the Standard, and continue to work with the UK built environment and real estate industry to facilitate the development of future versions of the Standard.

Contents

1. Scope

The UK Net Zero Carbon Buildings Standard (henceforth referred to as 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:

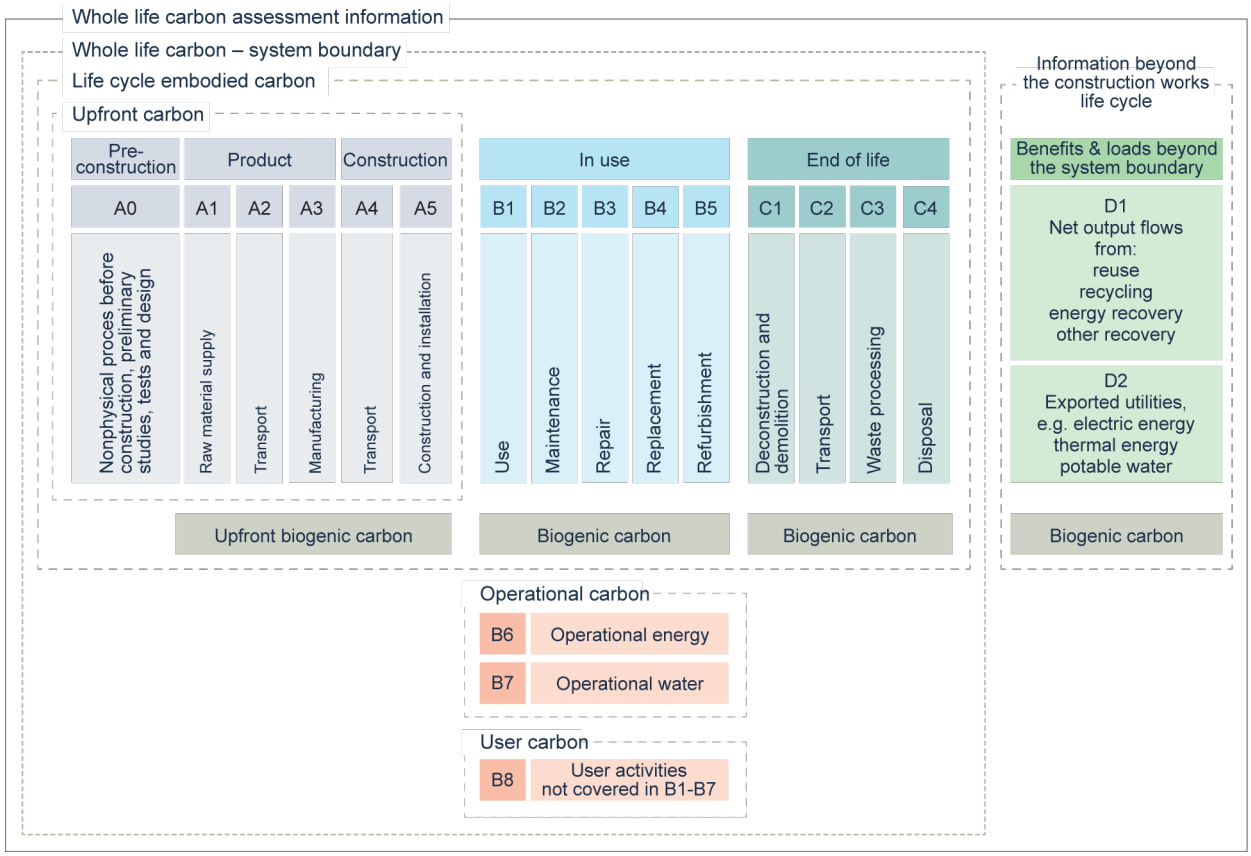
- Commercial Residential;
- Culture and Entertainment;
- Data Centres;
- Healthcare;
- Higher Education;
- Homes;
- Hotels;
- Offices;
- Retail;
- Schools;
- Science and Technology;
- Sport and Leisure;
- Storage and Distribution.

Buildings that cannot be classified into the specified sectors above cannot claim conformity with the Standard, but can still support the aim of the Standard by assessing and submitting energy use, carbon emissions and other metrics according to the Standard and sharing via the Submission Proforma (Annex B). Submissions will need to state that these buildings have not been verified to the Standard, but will be used to contribute to an evidence base that could be used to set limits or targets in future revisions of the Standard for those sectors.

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.



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)

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.

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.

If a specific version is cited, that version **shall** be used (e.g., a specific date of publication or edition reference, or similar). For undated references, the latest edition of the referenced document (including any amendments) applies.

Built Environment Carbon Database (BECD) Asset Library
https://www.becd.co.uk

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

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

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

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

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/view/uk-energy-from-waste-statistics-2023/

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

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

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

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

ISO IWA 42:2022 Net zero guidelines

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

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 15653:2021 and the RICS Professional Standard on Whole Life Carbon in the Built Environment, 2nd edition, 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 supply 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).

NOTE 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

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 $kgCO_2e/m^2$ 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), or for collection-based activities (e.g., museums, art galleries, libraries) but not including specialist archival 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 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 4.2.2).

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 4.2.2).

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.

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 Guidance Note, Code of measuring practice, 6th edition’ by the Royal Institution of Chartered Surveyors or the latest valid version.

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 New Works

As defined in section 4.2.1 and Table 5.

3.1.4.6 Retrofit Works

As defined in section 4.2.1 and Table 5.

3.1.4.7 Reportable Works

As defined in section 4.2.1 and Table 5.

3.1.4.8 Non-Reportable Works

As defined in section 4.2.1 and Table 5.

3.1.4.9 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 (see section 4.2.4), measured using NIA.

3.1.4.10 Existing Area

Also known as Existing NIA. All other areas of floor not covered by 3.1.4.9, measured using NIA.

3.1.4.11 Additional Use Area (AUA)

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 sub-metered. 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.

3.1.4.12 Shell and Core

Facilitating works, substructure, superstructure (frame, external envelope including roof), central/building-related plant, core life safety and external works.

Shell and core usually also includes the internal assemblies, finishes and FF&E associated with central and/or shared areas of the building, including external works, circulation/escape cores, entrances, servicing or delivery zones, amenities, centralised catering and sanitary facilities.

3.1.4.13 Category A

Any facilitating works required to the shell and core build, as well as finishes (e.g., raised access floors, suspended ceilings), MEP and fixed FF&E outside of the shell and core scope.

3.1.4.14 Category B

Any facilitating works required, in addition to the Category A works, to meet the specific requirements of the occupier, e.g., internal assemblies, final finishes or specialist linings, loose FF&E and information, communication and technology/audio-visual (ICT/AV) equipment. Category B fitouts can also include serviced areas such as dedicated kitchens.

3.1.4.15 Occupancy rate

As defined in section 5.2.4.1.

3.1.4.16 District heating and/or cooling network

A system that distributes heat or cooling (coolth) 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.

3.1.4.17 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.

3.2 Abbreviated Terms

Abbrv.	Full term	Section
BECD	Built Environment Carbon Database (www.becd.co.uk)	-
Cat A	Category A	3.1.4.13
Cat B	Category B	3.1.4.14
CPA	Common Parts Area, typically referring to areas shared by multiple occupants, such as lobbies, stairwells, corridors etc.	
ERP	Embodied Reporting Period	4.2.4
EUI	Energy use intensity	-
FF&E	Fittings, furnishings and equipment	-
GIA	Gross internal area	3.1.4.1
GHG	Greenhouse gas	3.1.1.2
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
NZC	Net Zero Carbon	-
ORP	Operational Reporting Period	4.2.4
REGOs	Renewable Energy Guarantees of Origin	3.1.1.13
RICS	Royal Institution of Chartered Surveyors	-
RPEP	Reporting Period End Point	4.2.4
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 Requirements of 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 conformity with this Standard.

Table 1 Types of content and conformity with this Standard

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 of this Standard

This Standard may be updated and new versions published from time to time. Table 2 shows all versions of this Standard on the date of publication of this version. Future versions of this Standard will be available on the UK Net Zero Carbon Buildings Standard website (www.nzcbuildings.co.uk).

Table 2 Versions of this Standard

Version number	Publication date	Notes
Pilot Version rev2	April 2025	Clarification of approach to Equation 1; Updated wording 'Date of Commencement throughout; Clarification of upfront carbon scope (5.1.2.4); Confirmation of GIA scope for reportable works (5.1.2.5) and Storage & Distribution (Table 8); Clarification that energy use

		includes renewables (5.2.1.2); Additional detail on operational energy scope for car parks (5.2.1.2); Addition of renewable heat to Table 11; Section 5.2.6.1 now incorporates previous content from 5.2.6.2, and rewords to clarify approach to Healthcare New Buildings, and to Existing Buildings (with and without retrofit); Update to locations listed in Table RE-1; minor formatting & legibility improvements throughout.
Pilot version rev1	October 2024	Confirmation of units and date label to Annex A; edits to Annex E; and minor formatting and layout amendments.
Pilot version	September 2024	Published for use as a technical specification and for industry feedback.

4.1.3 Pass/fail metrics and requirements

Pass/fail metrics and requirements have assessment requirements along with associated limits or targets to meet. These may be absolute requirements (e.g., no fossil fuels), numerical limits that **shall not** be exceeded (e.g., less than 10) or numerical targets that **shall** be met or exceeded (e.g., more than 10).

As numerical limits and targets vary according to building-specific factors such as the building/works type and sector, the actual values are given in Annex A.

4.1.4 Reporting metrics

Some metrics of this Standard have no limit or target to be met, but still require assessing and reporting. 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 this Standard, some reporting metrics may 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.

4.1.5 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 *Life cycle embodied carbon limits (future versions only)*	Life cycle embodied carbon 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
On-site renewable electricity generation	Annual on-site renewable electricity generation targets	Total annual on-site renewable electricity generation Annual on-site renewable electricity generation that is used on site Annual on-site renewable electricity generation that is exported On-site renewable electricity generation capacity
Operational water use	n/a	Annual operational water use 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 cooling networks	Carbon content limit for heat/coolth supplied	Energy used by the district energy scheme, associated with heat / coolth supplied Carbon emissions associated with heat/coolth supplied
Heating and cooling delivered to the building	Annual space heating/cooling delivered to the building limit Peak energy delivered for space heating/cooling limits	n/a
Refrigerants	Annual carbon impact limit of refrigerant gases – Kyoto products only GWP limit of refrigerants	Annual carbon impact of refrigerant gases – non-Kyoto products Annual carbon impact of refrigerant
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

For the purposes of this Standard, the building type **shall** be identified according to Table 4, and the works type(s) (if any) **shall** be identified according to Table 5.

NOTE 1 'Building types' typically define operational assessment, limits and targets requirements, whilst 'works types' typically define embodied assessment, limits and targets requirements. See section 4.2.5 for details.

NOTE 2 Building and works types are independent, e.g., a New Building could have Retrofit Works applied to it at a later date, without changing the building type.

Table 4 Building types

Building type	Criteria
New Building	Either: • ≥50% of NIA is new (see section 3.1.4.9), or • building is single-storey and all elements above the ground floor slab are new[a] • 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: • construction resulting in ≥50% of NIA being new (see section 3.1.4.9), or • building is single-storey and all elements above the ground floor slab are new.
Retrofit Works	Not New Works, and either: • ≥10% of original area of thermal envelope is new, upgraded or replaced[a], or • ≥10% of original glazed area is new, upgraded or replaced[a], or • >1 window is new, upgraded or replaced[a].
Reportable Works	Not Retrofit Works, and either: • value of the works ≥£100,000[b], or • new or replacement heating, or cooling, or ventilation plant or systems, or • 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

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 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 shall be 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 (only used as part of commercial centres / 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 two or more sectors from Table 6, according to the requirements in this section. If ≥70% of the NIA of the building is not classifiable after the requirements have been followed, the building **shall not** claim conformity with the Standard.

- Where the building has a single function throughout, classifiable as a single sector, it **shall** be classified as that sector.
- Where the building has an area of floor containing several subsectors but only one sector, that area of floor **shall** be classified as that sector.
  NOTE 1 E.g., if an area contains some performance spaces, and some archive spaces (both of which are subsectors of the Culture and Entertainment sector), then the whole area is classified as Culture and Entertainment.
- Where the building has an area of floor providing a function in service to another area of the building, then the servant area of floor may be classified as the same sector as the area that it serves. If it serves multiple areas of different sectors, then it may be classified as an appropriately prorated mixture of these areas.
  NOTE 2 E.g., if an office building contains multiple server rooms, all in service of the office, then the server room areas can be classified as Office (and not as Data Centres).
- Where the total area of floor classified as one sector (whether that's from one area of floor or several) accounts for <10% of the NIA of the building, that sector **shall** be ignored when determining the appropriate sector classification.
  NOTE 3 E.g., if a residential building (Homes sector) contains two retail units, each of which are 4% of the NIA of the whole building, and the remaining 92% is all residential, then the whole building is classified as Homes.
- Where a building has several areas classified as different sectors from Table 6, each of which are ≥10% of the NIA of the building, then the building **shall** be classified as Mixed-Use. The sectors included within the building **shall** be communicated clearly (see section 4.2.7).
  NOTE 4 E.g., if a residential building (Homes sector) contains two retail units, each of which are 5% of the NIA of the whole building, and the remaining 90% is all residential, then the whole building is classified as Mixed-Use, and both Homes and Retail would be mentioned when describing the mix of uses.

NOTE 5 Buildings that cannot be classified into the specified sectors above cannot claim conformity with the Standard, but can still support the aim of the Standard by assessing and submitting energy use, carbon emissions and other metrics according to the Standard and sharing via the Submission Proforma (Annex B). Submissions will need to state that these buildings have not been verified to the Standard, but will be used to contribute to an evidence base that could be used to include the sector, and/or set limits or targets for the sector, in future versions of the Standard.

4.2.3 Scope of whole building assessment

Unless noted otherwise, the assessment **shall** be in accordance with the RICS PS (see section 2).

The object of the assessment **shall** be the whole site and construction works according to the RICS PS section 4.3.

Where the building is part of a multi-building development, building-level assessment and apportioning of external/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.

Buildings linked by underground accommodation **shall** be assessed, reported and submitted as separate buildings.

For multi-building developments of the Single Family Homes subsector (see section 4.2.2), 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). This should be predicted early in the design process to determine building types, works types, and relevant pass/fail metrics.

NOTE 1 Where a building has not been verified previously, the RPEP is typically set at a date approximately one year after the minimum occupancy rate (section 5.2.4.1) 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 **shall not** be set at a date less than 12 months after the RPEP from previous verification, to avoid double-counting;
- the RPEP should be set as the day 12 months after the RPEP from the previous verification to ensure continual conformity with the Standard (see Figure 3 and section 4.3.1).

NOTE 2 Where the RPEP for a repeat 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 Figure 4 and section 4.3.1).

4.2.4.2 Embodied and Operational Reporting Periods

The Embodied Reporting Period (ERP) determines which works are assessed according to section 5.1. The Operational Reporting Period (ORP) determines the period over which operational aspects of the building's use are assessed according to sections 0 to 5.9.

Where the building has not previously been verified against the Standard, the ERP start point **shall** be five calendar years prior to the RPEP. Where the building has previously been verified against the Standard, the ERP start point **shall** be set as the day after the previously used RPEP, where this date is more recent than the dates shown above.

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

The ERP and ORP end points **shall** be the RPEP.

See Figure 2 for a visual representation of the RPEP, ERP and ORP for first verification of a building. See Figure 3 and Figure 4 for second verification examples.

NOTE 3 In future versions of the Standard, once verification requirements are included, there will likely be a time limit within which verification must be completed, relative to the RPEP, see section 6 for further information on verification principles.

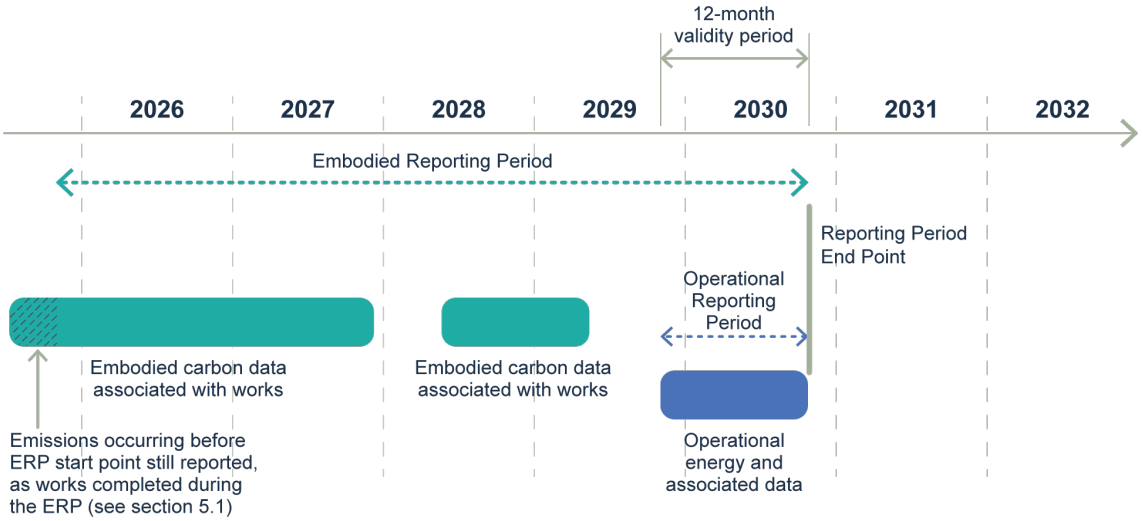


Figure 2 RPEP, ERP and ORP where building has not previously been verified (all embodied carbon from both projects above will be reported, as both projects reach practical completion during the ERP, see section 5.1.2).

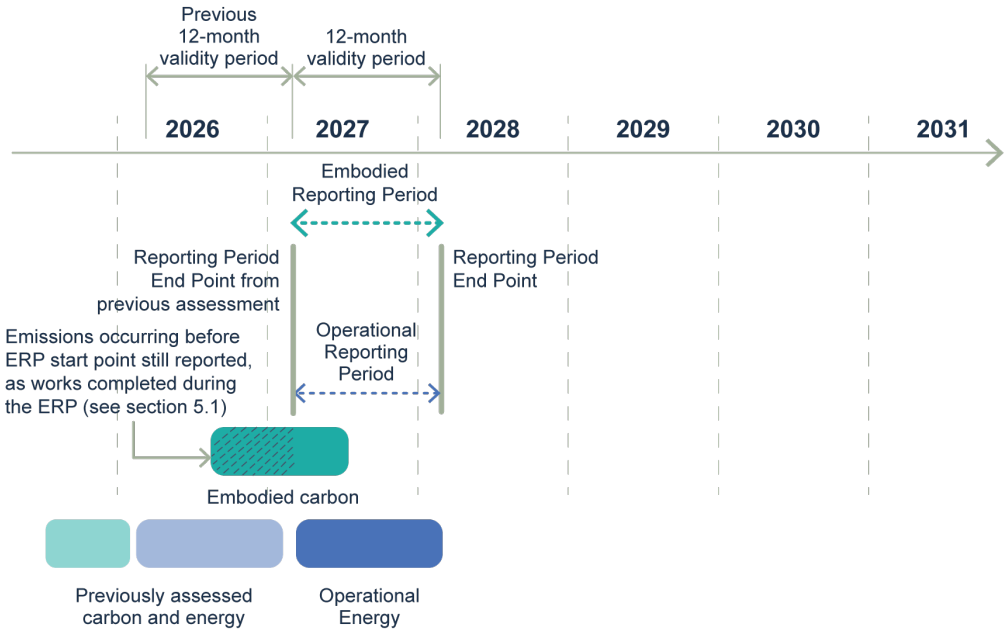


Figure 3 Typical RPEP, ERP and ORP for a second assessment, reporting and verification of a building. Note that the ERP for the second assessment starts the day after the previous RPEP.

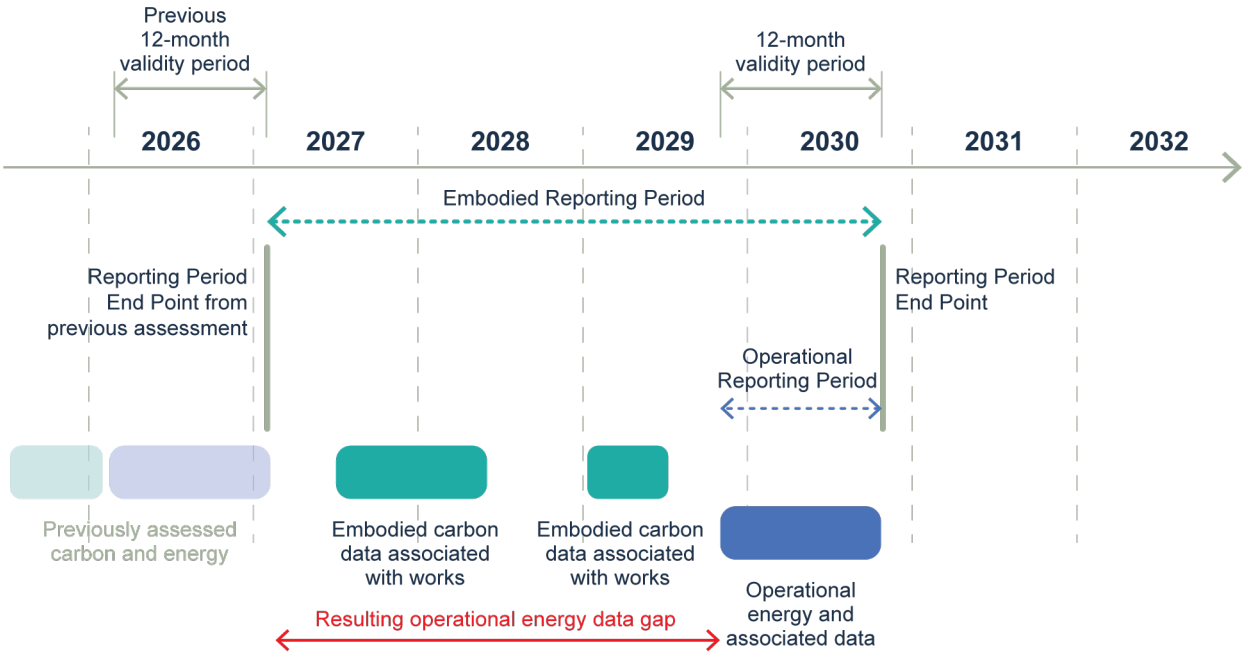


Figure 4 Where a gap longer than 12 months exists between RPEPs, this will lead to a gap in operational data, and thus a gap in claim validity that must be communicated (see section 4.3.1). The ERP still starts the day after the previous RPEP as this gives an ERP of less than 5 years.

4.2.5 Pass/fail metrics

4.2.5.1 Limits and targets

Where limits are provided (see section 3.1.2.6) and the Standard requires comparison with these, they **shall** be met by demonstrating that they have not been exceeded, and the assessed results associated with these pass/fail metrics should be as low as possible.

Where targets are provided (see section 3.1.2.7) and the Standard requires comparison with these, they **shall** be met by demonstrating that they have been met or exceeded, and the assessed results associated with these pass/fail metrics should be as high as possible.

The type of building identified in section 4.2.1 **shall** be used to identify the relevant limits and targets (Annex A) for operational aspects of the Standard such as operational energy limits, on-site renewable electricity generation targets, and so on (sections 0 to 5.9).

The type of works identified in section 4.2.1 **shall** be used to identify the relevant limits (Annex A) for embodied aspects of the Standard (section 5.1) and to determine whether a Retrofit Plan needs to be submitted (section 5.2.7).

4.2.5.2 Area-weighted limit/target calculation

Where the building satisfies any of the below criteria, all limits and targets **shall** be calculated in accordance with this section, using Equation 1:

- The building is Mixed-Use with multiple sectors (see section 4.2.2);
- The building has multiple subsectors (see section 4.2.2) even if only one sector,

- Retrofit Works take place, resulting in ≥10% and <50% of NIA being new (see section 3.1.4.9).

Each combination of sector, subsector, area, building and works type present in the building, that fulfils both the following criteria, **shall** be included in Equation 1:

- Where the total area(s) of floor classified as the sector or subsector is ≥10% of the building's NIA;
- Where the sector, subsector, area, building and works type combination has a limit/target value set.

If a sector determined in section 4.2.2 contains subsectors, those subsectors **shall** be considered separately in this section.

When using Equation 1 to calculate energy use intensity limits, Additional Use Areas (AUAs, see sections 3.1.4.11 and 5.2.1.3) **shall not** be included in the equation.

NOTE 1 E.g., for a building of 1000m² NIA, two areas each of 50m², both of the same sector, would be included in Equation 1.

NOTE 2 E.g., a building with two subsectors, one without a limit, would not need to use Equation 1, as the subsector without a limit would not be included in the equation, and so the remaining subsector limit would be used throughout the building.

The limits and targets derived from Equation 1 **shall** apply to all areas of the building, even those not used in the equation itself, but **shall not** apply to AUAs for energy use intensity.

Equation 1 Area-weighted pass/fail metric adjustment

$$M_A = \frac{(M_1 \times A_1) + (M_2 \times A_2) + (M_3 \times A_3) + (M_{etc} \times A_{etc})}{A_1 + A_2 + A_3 + A_{etc}}$$

Where:

- M_A = Adjusted limit/target value;
- $M_{1,2,3,etc}$ = The limit/target value applicable to the combination of sector, subsector, area, building, works types etc;
- $A_{1,2,3,etc}$ = The total NIA of the combination of sector, subsector, area, building, works types etc;

The total of $A_1 + A_2 + A_{etc}$ **shall** equal the NIA of the building, minus any areas excluded due to being <10% of the NIA, or due to being an AUA.

NOTE 3 Areas excluded from Equation 1 are still required to meet limits/targets associated with the building. The only exception to this is AUAs, which are exempted from meeting operational energy limits (once excluded from Equation 1), though are still required to meet other pass/fail metrics and pass/fail requirements such as upfront carbon.

NOTE 4 The reason for checking areas is to avoid double-counting, e.g., by mistakenly including a subsector and its overarching sector separately to each other.

4.2.5.3 Pass/fail metrics and future dates

Limit and target values for some pass/fail metrics become stricter over time (see Annex A). The limits and target values, relating to upcoming works or buildings that are planned to commence in the future (see section 4.2.6), **shall** be the values indicated as current for the year construction will commence, i.e. the Date of Commencement, (see Section 4.2.6).

NOTE 1 This means that if, for example, the design stages start in 2030 but the works do not commence until 2031, the limits and targets for 2031 are applicable.

NOTE 2 To reduce the risk of limits and targets not being achieved, designers are recommended to design to the limits and targets that are indicated as applicable to the year the works are expected to commence on site, and it is suggested that a contingency is allowed.

4.2.6 Date of Commencement

Limits and targets (Annex A) vary by Date of Commencement. To determine the Date of Commencement for any Works, the definitions in sections 4.2.6.1 to 4.2.6.3 **shall** be used.

The equivalent Date of Commencement for limits/targets relating to building type (New Building or Existing Building) **shall** be the date of the most recent New Works or Retrofit Works to have commenced in that building. Where no New Works or Retrofit Works took place after 2025, the 2025 limits/targets **shall** be used.

4.2.6.1 New Works

For New Works, the Date of Commencement is when at least one of the following activities has been started:

- Excavation for strip or trench foundations or for pad footings;
- Digging out and preparation of ground for raft 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, 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, 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 4.2.2 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.

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.

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; Number of tickets sold per year; Seats; Theatre type i.e. "Receiving" or "Producing".

Culture and Entertainment, Collection subsector	Visitor numbers per year.
Culture and Entertainment, Archives subsector	Linear metres of storage.
Higher Education	Occupied hours (typical weekday and weekend during term time, and outside of term time); Number of occupants (average weekday and weekend during term time, and outside of term time).
Homes	Number of bedrooms.
Hotels	Number of bedrooms; Number of occupied bedroom-nights per year; Conditioned area [m^2 NIA].
Offices	Office occupancy type (either: general office; financial; legal; event space; other – please specify); Occupied hours (typical day & weekend, e.g., 8am-6pm, 5 days a week; no weekend occupancy); Average occupancy density on typical day [number of occupants per m^2 NIA, during typical day].
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, 'commercial centres / shopping centres' only	Landlord area [m^2 NIA].
Schools	Number of pupils; Core hours (e.g., typical day e.g., 8am-5pm); Out-of-hours usage [hrs/year].
Science and Technology	Type of facility(ies) and associated floor area (m^2 GIA) (either: general research lab; high demand lab CL3 or above; pharmaceutical R&D; pharmaceutical manufacturing; computational science; other – please specify); Percentage active science/technical area [% of total building floor area GIA]; Laboratory gas consumption per year [m^3/year] (see also section 5.5); Fume cupboard density [number of fume cupboards per m^2 GIA]; Vibration specification [Response Factor, R].
Storage and Distribution	Internal building volume [m^3].

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

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 not included in the proforma is to be submitted, this **shall** be submitted in a report at the same time that the proforma is submitted.

4.3 Claiming conformity with this Standard

This Standard requires assessment of building performance based mostly on measured quantities, as opposed to predictive models. As such, conformity with this Standard can only be assessed and verified for buildings whose construction has been completed and are fully in-use (see section 5.2.4.1) at the time of the assessment.

NOTE 1 Section 4.2.2 states that if a large area of the building cannot be classified as any of the sectors in the Standard, then the building cannot claim conformity.

NOTE 2 Conformity, and thus claiming a building is a 'Net Zero Carbon Aligned Building' (or '…(plus offsets)') includes the need to meet the Verification and Communication clauses of the Standard. Those clauses will be published in 2024, at which point assessments undertaken to the Pilot version will need to be submitted for verification, and once approved, can claim conformity with this Standard. Until such point, public declarations of conformity cannot be made.

4.3.1 Dates of claims

A claim of conformity (sections 4.3.2 and 4.3.3) **shall** only be valid for the 12 months prior to the RPEP. The start and end date for which the claim is valid **shall** be clearly communicated.

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 the past claims.

NOTE 1 E.g., if the RPEP was set as 31 December 2027, then the claim would state that the building conformed with the Standard during the 12-month period 01/01/2027 – 31/12/2027.

NOTE 2 E.g., if a first claim was based on an RPEP of 31 December 2027, and a second was based on an RPEP of 31 December 2028, then the most recent claim would state that the building conformed with the Standard during the two contiguous 12-month periods of 01/01/2027 – 31/12/2028.

NOTE 3 E.g., if a first claim was based on an RPEP of 31 December 2027, and a second was based on an RPEP of 31 December 2029, then the most recent claim would state that the building conformed with the Standard during the 12-month period 01/01/2027 – 31/12/2027, did NOT conform with the Standard during the intervening period 01/01/2028 – 31/12/2028, and conformed again during the 12-month period 01/01/2029 – 31/12/2029.

4.3.2 Requirements for a 'Net Zero Carbon Aligned Building' claim

To claim a building is a 'Net Zero Carbon Aligned Building' according to this Standard, all the requirements of this Standard **shall** be met and verified except those in the following section: 5.10 Carbon offsetting.

4.3.3 Requirements for a 'Net Zero Carbon Aligned Building (plus offsets)' claim

To claim a building is a 'Net Zero Carbon Aligned Building (plus offsets)' according to this Standard, all the requirements of this Standard **shall** be met and verified.

4.3.4 Equivalence with other standards/schemes (for information)

In a future version of the Standard, it is intended to provide a mechanism for buildings that have achieved other built environment assessment methodologies (henceforth collectively referred to as 'standards/schemes') to use achievement of the standard/scheme as evidence to demonstrate that they are meeting specific requirements of the Standard.

Equivalence of standards/schemes will be determined through a process of technical engagement. Where equivalence can be demonstrated, the scheme/standard can be deemed to satisfy specific aspects of this Standard. This will only be possible for standards/schemes under the conditions explained in Annex C, and following their inclusion in Table C2.

See Annex C for details on how standards/schemes can demonstrate equivalence, and how achievement of equivalent standards/schemes could be used to meet specific requirements of the Standard. This Annex is also where the Schedule of Equivalent Standards/schemes will be recorded.

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 item of works is to be individually assessed, reported and compared to limits. E.g., for:

- New Works or Retrofit Works of multiple buildings separated above ground.
- Reportable Works happening in different parts of the same building.
- Reportable Works happening in the same location but 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 works that are within scope have been identified, then the following will need to be undertaken for each item 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 contains (see section 4.2.2);
3. Identify the relevant limit(s) for the works (see Annex A);
4. Undertake the relevant embodied carbon assessments (see sections 5.1.2 to 5.1.4) by completing a life cycle embodied carbon assessment (section 5.1.2.2), and re-using the data for the other in-scope assessments (sections 5.1.2.3 to 5.1.2.6):
    a. Where a building shares external works, basements and foundations with other buildings, embodied carbon is to be pro-rated between them (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 both life cycle embodied carbon limits (A-C) and upfront carbon limits (A1-A5);
    b. New Works within spaces defined as Offices sector are required to meet shell and core limits as well as whole-building limits;
    c. Reportable Works within spaces defined as Offices sector are required to meet Reportable Works limits;
    d. Renewable electricity generation systems (e.g., PVs) are excluded from scope when comparing to other limits, and have separate limits of their own (see section 5.1.6.3).

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 types other than Non-Reportable Works (section 4.2.1) that achieved Practical Completion during the ERP (section 4.2.4), embodied carbon **shall** be assessed according to the requirements of section 5.1.4, and reported and submitted to the verifier according to section 5.1.5.

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.

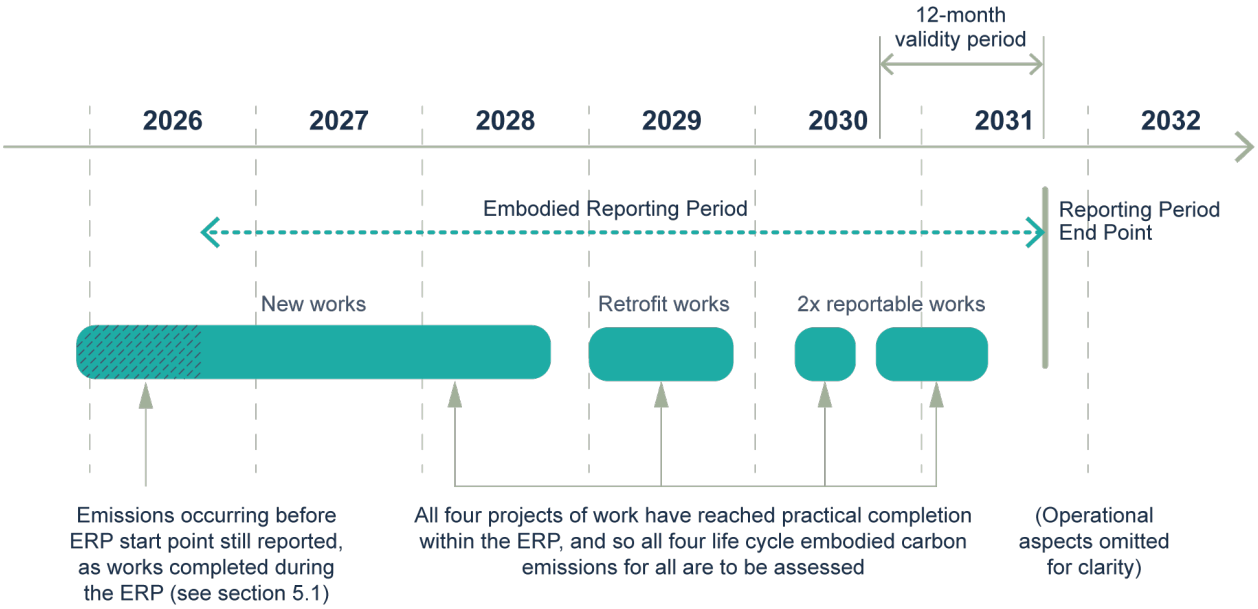


Figure 5 Examples of multiple works requiring assessment

NOTE 1 Minimisation of embodied carbon emissions and achievement of limits is more likely if embodied carbon is assessed and the results acted upon from the early design stages, and throughout the works.

NOTE 2 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 (see sections 4.2 to 4.4) **shall** be undertaken, including modules A0-A5, B1-B5, C1-C4.

Like-for-like replacement **shall** be used for the assessment of life cycle embodied carbon as per RICS section 5.2.4, meaning that Module B5 will be zero.

NOTE 1 Module A0 is likely to be zero for most building works.

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 a New Building (see section 4.2.1) includes provision for the retention of some existing structures. The RICS PS (section 3.3) includes requirements on the embodied carbon assessment of retained structures.

5.1.2.3 Life cycle embodied carbon assessment scope – Reportable Works

Reportable Works are only treated as a separate assessment when clearly not associated with any New Works or Retrofit Works (see section 4.2.1), the assessment of which includes all RICS PS building element categories including fit-out (see section 5.1.2.2). The first fit-out of a building **shall** be included within the assessment of the New or Retrofit works that they are a part of, including replacement of speculative fit-out (see section 5.1.2.1). A separate assessment as Reportable Works **shall** only be undertaken when clearly occurring not as part of any New or Retrofit Works.

The scope of life cycle embodied carbon assessment for Reportable Works, **shall** be according to the general embodied carbon assessment scope (see section 5.1.2.2), with the following additional exclusions:

- Products/materials not within the scope of the construction works **shall** be excluded;
- If the building has changed ownership after the completion of Reportable Works, the embodied carbon associated with those works may be excluded.

NOTE 1 The above exclusion 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 floorplate that the Reportable Works apply to.

For buildings with multiple tenants, individual assessments **shall** be undertaken for works occurring in each area with a different tenant. Where works occur in areas that are <500m^2 NIA, that are occupied by a single tenant that is not the building owner, these works may be excluded.

NOTE 2 The 500 m^2 NIA threshold is intended to be reduced in future versions of the Standard and/or delineation requirements will be added to differentiate between tenants and owners who do and do not meet the requirements of the Standard. It is recommended that all building owners move towards leases that require the reporting of carbon data by all tenants.

5.1.2.4 Upfront carbon assessment scope – General

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

- Life cycle module A0;
- Emissions arising from toxic/contaminated material treatment and/or demolition works (RICS PS building element category 0.1.1);
- Products/materials within the external works (RICS PS building element category 8);
- Loose FF&E products/materials (within element categories 4.4, 4.5 and 4.6), for all sectors except:

  - Offices, where loose FF&E **shall** be included;
  - Culture and Entertainment, where the following items (often considered loose FF&E) **shall** be included:
    - All performance seating;
    - All stage extensions or alternative stage formats stored on site;
    - All tension wire grids, winches, bars and flying systems;
    - All integrated performance equipment, including cinema screens, speakers, AV/sound/lighting infrastructure and dimmer racks;
    - Shelving and racking in archive areas.
- Products/materials included within the on-site renewable electricity limit scope (see sections 5.1.2.2 and 5.1.2.7).

NOTE 1 According to the RICS PS definition of upfront carbon, biogenic carbon sequestered in the installed products/materials at practical completion is excluded.

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

Where >50% of the NIA is classified as Offices sector (see section 4.2.2), Shell and Core, Cat A and Cat B upfront carbon **shall** also individually be assessed. The scope of the assessments **shall** be as above, with the following additional modifications:

- For the Shell and Core upfront carbon assessment, products/materials that are not within the scope of Shell and Core **shall** be excluded;
- For the Cat A upfront carbon assessment, products/materials that are not within the scope of Cat A **shall** be excluded;
- For the Cat B upfront carbon assessment, products/materials that are not within the scope of Cat B **shall** be excluded.

NOTE 3 It is anticipated that these assessments can use the results from the whole building upfront carbon assessment (section 5.1.2.4), filtered to the scopes of these three assessments.

NOTE 4 Cat A and Cat B assessments are for reporting and submission purposes only and do not need to be compared to limits.

NOTE 5 As better data becomes available, further sectors may be added to the requirements above around shell and core assessment, reporting and submission to the verifier.

5.1.2.5 Upfront carbon assessment scope – Reportable Works

The scope of the assessment **shall** be according to the general upfront carbon assessment scope (see section 5.1.2.4), with the following additional exclusions:

- Products/materials not within the scope of the construction works.

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

For buildings with multiple tenants, individual assessments **shall** be undertaken for works occurring in each area with a different tenant. Where works occur in areas that are <500m^2 NIA, that are occupied by a single tenant that is not the building area, these works may be excluded.

NOTE The 500 m^2 NIA threshold is intended to be reduced in future versions of the Standard and/or delineation requirements will be added to differentiate between tenants and owners who do and do not meet the requirements of the Standard. It is recommended that all building owners move towards leases that require the reporting of carbon data by all tenants.

5.1.2.6 Upfront carbon assessment scope – generic material specifications

An additional upfront carbon assessment **shall** be completed, that is identical to the general upfront carbon assessment (see section 5.1.2.4), except that the A1-A3 carbon factors **shall** be changed according to the following:

- All structural concrete products/materials **shall** be according to the recommended default values given in 'How to Calculate Embodied Carbon' (see section 2);
- All structural steel products/materials, including reinforcement and secondary structure, **shall** be according to the recommended default values given in 'How to Calculate Embodied Carbon';
- All façade and structural aluminium products/materials **shall** be according to the recommended default values given in 'How to Calculate Embodied Carbon';

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

NOTE 1 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. Submission of quantities (refer section 5.1.5.8) to the verifier will also inform this. In addition, comparing these results with the results from the main assessment following 5.1.2.4 helps show whether the meeting of upfront carbon limits was dependent on the use of lower-carbon material specifications or through material efficiency and reuse approaches.

NOTE 2 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 the following types of on-site electricity generation, whether integrated into the building fabric or elsewhere within the building curtilage:

- Photovoltaics;
- On-site wind turbines;
- On-site hydroelectric turbines.

Other products/materials, with function(s) only relating to the above systems, may be included in the scope (e.g., secondary framework installed only to support the additional weight imposed by photovoltaic cells).

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 Items excluded within the scope of the on-site renewable electricity generation are therefore excluded from the scope of upfront carbon that is compared to the general limits, see section 5.1.6.2.

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 limits [kgCO_2e/m^2 GIA] (see sections 5.1.2.4 and 5.1.6.2)	Life cycle embodied carbon [kgCO2e/m^2 GIA] (see section 5.1.2.2 and 5.1.2.3) Upfront carbon, Reportable Works [kgCO2e/m^2 GIA] (see section 5.1.2.5) 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 limits [kgCO_2e/m^2 GIA] (see sections 5.1.2.4 and 5.1.6.2) Upfront carbon limits, shell & core only [kgCO_2e/m^2 GIA] (see sections 5.1.2.4 and 5.1.6.2) Upfront carbon limits, Reportable Works [kgCO_2e/m^2 GIA] (see sections 5.1.2.5 and 5.1.6.2)	Life cycle embodied carbon [kgCO_2e/m^2 GIA] (see section 5.1.2.2 and 5.1.2.3) Upfront carbon, generic material specifications [kgCO_2e/m^2 GIA], [kg] (see section 5.1.2.6) Upfront carbon, Cat A only [kgCO_2e/m^2 GIA] (see section 5.1.2.4) 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	Upfront carbon limits [kgCO_2e/m^2 GIA] (see sections 5.1.2.4 and 5.1.6.2)	Life cycle embodied carbon [kgCO_2e/m^2 GIA] (see sections 5.1.2.2 and 5.1.2.3)

is Storage and Distribution sector		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) Upfront carbon, Reportable Works [$kgCO_2e/m^2$ GIA] (see section 5.1.2.5) Upfront carbon per m^3 internal building volume[a] [$kgCO_2e/m^3$ of internal building volume] (see sections 5.1.2.4) Upfront carbon, generic material specifications [$kgCO_2e/m^2$ GIA], [kg] (see section 5.1.2.6)
On-site renewable electricity generating equipment	Photovoltaics only: Upfront carbon per peak power output limit [$kgCO_2e/kWp$] (see sections 5.1.2.7 and 5.1.6.3)	Life cycle embodied carbon [$kgCO_2e$] (see section 5.1.2.7) Photovoltaics only: Peak power [kWp] 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 (see section 2), with the variations and amplifications set out in this section.

The assessment **shall** include the RICS PS 'WLCA uncertainty factor' (see section 4.10 of the RICS PS).

5.1.4.1 Applicable quantity information

Quantity information **shall** be according to the sources listed for 'Post-completion phase – actual quantities' in table 6 of the RICS PS. 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

If, for a specific product/material, more appropriate and building-relevant lifespan information is available than is provided in table 20 of the RICS PS, then this more appropriate and building-

relevant information **shall** be used. Else, table 20 of the RICS PS **shall** be used for the product/material in accordance with the RICS PS.

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 6.

Use of the term 'product' in Figure 6 also refers to materials and systems.

Environmental product declarations (EPD), used for construction products, **shall** be independently verified according to ISO 14025, and use EN 15804 or ISO 21930:2017 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 and EN 15804, as the core product category rules.

NOTE 1 For the calculation of the carbon data uncertainty factor (see section 4.10 of the RICS PS), the EPD would be considered as a proxy EPD, as the actual manufacturer is not covered by the EPD.

NOTE 2 Different geography and technology would mean significant difference in impact.

NOTE 3 For the calculation of the carbon data uncertainty factor, the EPD would be considered as a proxy EPD, as the actual manufacturer and the geography are not covered by the EPD.

NOTE 4 For the calculation of the carbon data uncertainty factor, the EPD would be considered as a proxy EPD, as the actual manufacturer and the technology are not covered by the EPD.

NOTE 5 For the calculation of the carbon data uncertainty factor, the EPD would be considered as a proxy EPD, as the actual manufacturer, the technology and geography are not covered by the EPD.

NOTE 6 In the case of MEP products, for any items costing >1% of the cost of the building, the 'Mid-level Calculation' given in 'TM65 Embodied carbon of building services: a calculation methodology including 2022 addendum' must be used. For other items, the TM65 'Basic Calculation' can be used. In the case of non-MEP products, for any items costing >1% of the cost of the building, the 'Full Approach' given in 'How to calculate the embodied carbon of facades: A methodology' must be used. For other items, the CWCT 'Simplified Approach' can be used.

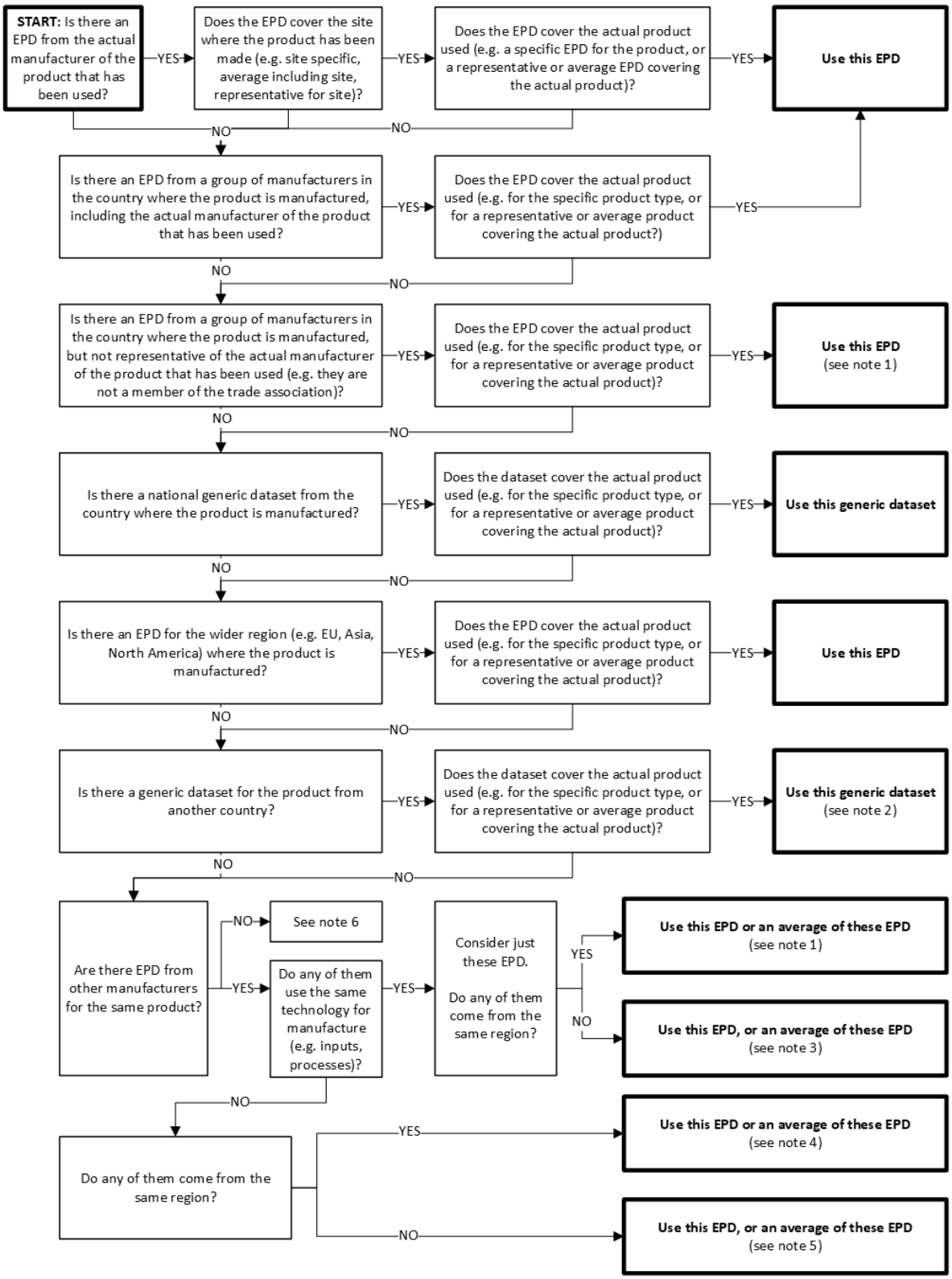


Figure 6 Carbon data selection flowchart – construction products/materials and systems life cycle module A1-A3

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 15941:2024.

5.1.4.5 Transport to site scenarios

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, empty return and fuel consumption data, if known. Where this is not known, emissions should 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 (see section 2), 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).

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 3.1.4.9 and 3.1.4.10), 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) 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 **shall** be submitted.

NOTE For this additional upfront carbon assessment, any emissions not affected by using generic carbon factors do not need to be submitted. It is expected that as a minimum, the submission would include any RICS PS building element categories that contain concrete, steel and 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 the following:

- Total kg of all concrete of grades at least C16/20 or equivalent;
- Total kg of all other cementitious materials including screeds;
- Total kg of all reinforcing steel ('rebar') including mesh;
- Total kg of all other steel including beams, columns, plate and connections;
- Total kg of all aluminium used within facades.

NOTE This list of material quantities may 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 the first version of this Standard (section 4.1.2) and completed during the ERP, comparison with limits **shall** be carried out according to section 5.1.6 and the requirements of the limits **shall** be met.

NOTE For works that commenced prior to the date of publication of the first version of this Standard and completed within the ERP, assessment and submission to the verifier is required according to this section 5.1, but comparison with the limits is not required.

5.1.6.1 Life cycle embodied carbon limits

If one or more life cycle embodied carbon limits are available (see Annex A) for the applicable works type and sector (see sections 4.2.1 and 4.2.2), comparison with the life cycle carbon limit(s) **shall** be carried out and the requirements of the limit(s) **shall** be met. The scope **shall** be according to section 5.1.2.4 of this Standard.

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.

5.1.6.2 Upfront carbon limits

If one or more upfront carbon limits are available (see Annex A) for the applicable works type and sector (see sections 4.2.1 and 4.2.2), comparison with the upfront carbon limit(s) **shall** be carried out and the requirements of the limit(s) **shall** be met. The scope **shall** be according to section 5.1.2.4 of this Standard.

The assessment results corresponding to the scope (see section 5.1.2.4) relevant to the type of limit **shall** be used (e.g., the Offices shell and core assessment within section 5.1.2.4 compared to the Offices shell and core limit in Annex A).

Where >50% of the NIA for the building is classified as Offices sector (see section 4.2.2), comparison with the "Reportable Works" upfront carbon limit **shall** also be carried out for any Reportable Works located within the areas classified as Offices sector, and the requirements of the limit(s) **shall** be met. The scope **shall** be according to section 5.1.2.5 of this Standard.

NOTE Where sectors are not covered by the Standard, or there are subsectors of projects whose upfront carbon emissions are always too high to conform with the Standard, it is recommended that the data from these projects are reported to BECD in the same manner as verified projects, to help build an evidence base that can be used to add further sectors/subsectors/limits in the future.

5.1.6.3 Upfront carbon limits – on-site renewable electricity generation

If the works include newly installed on-site renewable electricity generation, each system **shall** be compared to the upfront carbon limits (Annex A) if present, and the requirements of the limit **shall** be met. The scope **shall** be according to section 5.1.2.7 of this Standard.

Even when no limits are present in Annex A, the system **shall** still require life cycle embodied carbon assessment and submission to the verifier in accordance with 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 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 use 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:

- Heavy process loads, if the associated carbon emissions are already managed by regulation (e.g., the UK Emissions Trading Scheme);
- Energy used by external works (RICS PS building element category 8, see RICS PS Supporting Document - Building Element Categories Spreadsheet) including street lighting and service yards.

Energy use in car parks (including electric vehicle charging), even where the car park is internal, **shall** be submetered in New Buildings or where the car park is part of a New Area (see section 3.1.4.9).

Energy use in car parks (including electric vehicle charging), even where the car park is internal, should be submetered in Existing Buildings or where the car park is part of a Existing Area (see section 3.1.4.10).

5.3.1.2NOTE 1 'Heavy process loads' refers to the energy used during manufacturing, production, waste treatment or other industrial processes (e.g., chemical, physical, electrical, or mechanical processes during the production or manufacture of products). 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. This does not cover space heating and cooling to the spaces where the process is occurring.

NOTE 2 It is intended that delineation requirements will be added to a future version of the Standard for operational energy.

NOTE 3 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.

5.2.1.3 Operational energy assessment scope – Additional Use Areas

Areas of building used as shown in Table 9 may be classified as Additional Use Areas (AUAs, see section 3.1.4.11), provided that the area is metered separately to the rest of the building (allowing separate measurement and reporting of energy use). AUAs need to assess energy use as a reporting metric, but are exempt from meeting limits as a pass/fail metric.

Classifying areas as AUAs does not change the sector classification of the building (see section 4.2.2).

Table 9 - Areas that may be classified as AUAs

Sector	Areas may be classified as AUAs when sub-metered and used for the following:
Commercial Residential	Laundry.
Culture & Entertainment	Theatre production workshops.
Hotels	Conference centres; 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; Large specialist uses (e.g., CDT equipment, multiple kilns, etc.).
Science and Technology	Equipment with safety critical function (e.g., ETP etc.); 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.
Sport and Leisure	High intensity uses; Community uses (e.g., “warm spaces”).

NOTE AUAs 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, AUAs are assessed, reported and submitted separately to the rest of the building, and have no energy use indicator limits.

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 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 [kgCO_2e/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] Annual operational carbon emissions intensity per m^2 GIA per year [kgCO_2e/m^2 GIA/year] Annual operational carbon emissions per kWh of IT energy use [kgCO_2e/kWh of IT energy use] 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 Net Zero Building Standard, including clauses relating to domestic hot water and unregulated loads (advisory in NHS NZBS but mandatory in the Standard, see section 5.2.6.1)	Annual operational carbon emissions intensity per m^2 GIA per year [kgCO_2e/m^2 GIA/year] Energy use intensity (EUI) per m^2 GIA per year [kWh/m^2 GIA/year], per space type as defined by NHS Net Zero Building Standard Energy use intensity (EUI) for Domestic Hot Water per m^2 GIA per year [kWh/m^2 GIA/year] 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 [kgCO_2e/m^2 GIA/year] Energy use per m^2 conditioned area per year [kWh/m^2 CA/year] 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] *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] Annual operational carbon emissions intensity per m^2 GIA per year [kgCO_2e/m^2 GIA/year]
Retail	All sub-sectors	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]

	Commercial centres / 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] Energy use per m^2 landlord area [kWh/m^2CPA/year]

[a] Where AUAs have been identified (see section 5.2.1.3), 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.

Table 11 Measurement – operational energy

Energy type	Use measurement approach
Grid supplied electricity	Meter readings
Grid supplied natural gas	Meter readings
Grid supplied thermal energy	Meter readings
Bulk supplied fuels (e.g., oil, coal, LPG, biofuels)[a]	Based on annual stock measurements and deliveries
Renewable electricity generation	Meter readings (see section 5.3.2)
Renewable heat (solar thermal and geothermal) generation	Meter readings
District heating and cooling systems	Heat meter readings (refer to section 5.7 regarding calculation methodology for carbon content of heat and energy used by the scheme, and its allocation to the building)

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

For on-site electricity generation, the total electricity generated **shall** be measured using meter readings and the quantity used on site separated from that which is exported. If the figures cannot be separated (e.g., sub-metered data is not available) all electricity generated on site **shall** be assumed to be used by the building (i.e. it will be counted towards its energy use for submission to the verifier, and for comparison with any relevant limits).

For buildings connected to district heating / cooling networks, operational energy use **shall** include energy used by the network for generation and distribution, allocated to the building in proportion to the heat (or coolth) delivered to the building.

5.2.3.2 Carbon assessment for operational energy

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

The reporting is based on Set 3 emission factors recommended for operational energy assessment reporting in RICS Whole life carbon assessment for the built environment Version 2:2023, with the following exclusions:

- Upstream emissions from embodied carbon in infrastructure used to extract, create or process energy;

Upstream emissions from embodied carbon in infrastructure used to distribute and store energy.The scope of carbon emissions **shall**, as a minimum, include the following:

- Direct GHG emissions (GHG Protocol Scope 1);
- Indirect GHG 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).

The carbon emissions, as $kgCO_2e$, **shall** be calculated by multiplying the energy consumption over the assessment period by the carbon emissions factors specified in sections 5.2.3.3 to 5.2.3.5.

The methodology for calculating carbon emissions from district heating and district cooling is set out in section 5.2.3.6, and the methodology for calculating carbon emissions from CHP products is set out in section 5.2.3.7.

In all cases, the most recently available data available at the 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

For the calculation of carbon emissions from fossil fuels and biofuels, the following emission factors from UK Government Conversion Factors for Company Reporting of Greenhouse Gas Emissions, full set (for advanced users) (see section 2) **shall** be used:

For fossil fuel emission factors:

- Fossil fuels – “Fuels”;
- Well to tank emission from fossil fuels – “WTT- fuels”.

For biofuel emission factors:

- Biofuels – “Bioenergy”;
- Well to tank emissions from biofuels “WTT- bioenergy”.

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 published by Tolvik Consulting.

Thermal energy from waste heat (e.g., from data centres or industrial processes) **shall** be assigned an emission factor of zero but any transmission and distribution losses **shall** be included as specified in section 5.2.3.7.

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 The carbon emissions from fossil and biofuels that are used onsite as part of allowed exceptions under the fossil fuel free requirement must still be reported.

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 for Company Reporting of Greenhouse Gas Emissions, full set (for advanced users) (see section 2) **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 onsite

Renewable electricity generated and used onsite **shall** be assigned an emission factor of zero.

Where module D is reported as part of the Whole Life Carbon Assessment, renewable electricity generated onsite 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 Carbon emission factors for district heating and cooling

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

Equation 2 Carbon emission factor for district heating or cooling

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

Where:

- $kgCO_2e_{generation}$ = Annual carbon emissions from all of energy sources used 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 heat or cooling to all final users calculated from the energy inputs used to distribute the heat or cooling multiplied by their respective emission factors (see sections 5.2.3.3 and 5.2.3.4).
- $KWh_{heat,cooling}$ = Annual kWh of heat or cooling at the point of connection to the building delivered to all final users.

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

5.2.3.7 Carbon emission factors for CHP

Electricity consumed by the building that is generated from combined heat and power is assigned the same emission factor as grid supply electricity.

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

Equation 3 Carbon emission factors for CHP

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

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)
- $kWh_{electricity}$ = Annual kWh of electricity delivered to final users.
- $kWh_{CHPheat}$ = Annual heat delivered to final users.
- $EF_{electricity}$ = Emission factor for grid supply electricity ($kgCO_2e/kWh$)

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 ORP (see section 5.2.4).

The minimum occupancy rate requirements **shall** be met (see section 5.2.4.1), for buildings intended to be occupied, on the first day of this period. For all other buildings, the building **shall** be operational on the first day of this period.

NOTE 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.

5.2.4.1 Minimum occupancy rate

The minimum occupancy rate, during the ORP, **shall** be based on the floor area of separately occupiable spaces that are occupied, as a percentage of the total occupiable floor area in the building (see Equation 4).

A separately occupiable space is an enclosed area within a building that could be occupied by different tenants or have different owners e.g., for apartment buildings, individual flats. Separately occupiable space excludes spaces that are used by multiple separately occupiable spaces (e.g., common areas including reception and circulation areas).

Equation 4 Occupancy rate

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

$$S_t = S_1 + S_2 + S_3 \ldots$$

$$A_n = A_g - A_u$$

Where:

- S_t = The total floor area of occupied spaces;
- S_1 etc. = The floor area of a separately occupied space;
- O = Occupancy rate;
- A_n = The total occupiable floor area of the building;
- A_g = The total GIA of the building;
- A_u = The total floor area of the building not designed to be occupied.

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

The occupancy rate **shall** be either:

- ≥80% if the pass/fail metric is based on GIA;
- ≥75% if the pass/fail metric is based on NIA.

5.2.5 Submission requirements

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

- 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);
- Details of areas assigned different sectors in accordance with section 5.2.6 and Table 12, or classified as Additional Use Areas (AUAs, see section 3.1.4.11) in accordance with section 5.2.1.3 and Table 9;
- Where AUAs have been identified in accordance with section 5.2.1.3, details must be submitted separately for energy use, carbon emissions, NIA and GIA, clearly detailing these for both the AUAs and the remainder of the building, with no double-counting;
- Submission demonstrating that energy use intensity limits have been met **shall** net out all energy and areas associated with AUAs;
- If heavy process loads are excluded, details on how the associated carbon emissions are already managed by regulation;
- Carbon emissions resulting from operational energy usage, including carbon emission factors used (see section 5.2.3.2);
- Data used for, and calculation of, the occupancy rate. This should include the floor area measurements of the building, the total occupiable area, the separately occupied spaces and unoccupiable areas, details on how the separately occupied space criteria are met, and the number of occupants (see section 5.2.4.1);
- Meter readings and other energy use measurement data (see section 5.1.4);
- Relevant electrical schematic drawings;
- Where relevant, a Retrofit Plan (see section 5.2.7);
- A statement confirming how annual operational energy has been measured and reported.

5.2.6 Limits and pass/fail requirements

When setting energy use intensity limits (see section 4.2.5.2 and Equation 1), floor areas with uses shown in Table 12 **shall** be classified according to the sector in the table for the purposes of Equation 1, where that use is not covered under the original sector's definition (see section 3.1.3). This does not change the classification of the building.

Table 12 Reassignment of sectors to inform energy use intensity limits

Usage of area within buildings classified as other sectors	Sector/subsector limit to use in Equation 1
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
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

Additional Use Areas (AUAs, see section 3.1.4.11) are not required to meet operational energy limits, and are omitted from calculations of energy use intensity limits (see section 4.2.5.2 and Equation 1), when classified as such in accordance with section 5.2.1.3.

NOTE 1 E.g., if a school contains a gym and no other sectors, an area-weighted energy use intensity limit will be set using the 'Sport and Leisure, Fitness' limit for the area of gym. However, this does not affect section 4.2.2 and therefore the building would still be classified as a School (and not Mixed-Use).

NOTE 2 The energy use intensity limits based on this section and 4.2.5.2 will be applied to areas excluding any AUAs, which are assessed and reported separately from the rest of the building (see sections 5.2.1.3 and 5.2.5).

5.2.6.1 Operational energy limits and pass/fail requirements

Comparison with the operational energy limit (see Annex A), applicable to the building type and sector (see sections 4.2.1 and 4.2.2), **shall** be carried out and the requirements of the limit **shall** be met, excluding for the following building types:

- Buildings classified as a New Building, and also as Healthcare. For these buildings, operational energy use **shall** comply with the NHS Net Zero Building Standard, including the limits relating to domestic hot water and unregulated loads (which are advisory in the NHS-NZBS, but mandatory for conformity with the Standard);
- Buildings classified as Mixed-Use, where part or all of the New Area(s) (see section 3.1.4.9) is classified as Healthcare. These buildings **shall not** claim conformity to the standard.

NOTE 1 Mixed-use buildings containing New Area can't claim conformity due to current incompatibility between the NHS-NZBS and the Standard. It is hoped that this will be resolved in a future version of the Standard.

If the building includes Existing Areas (see section 3.1.4.10), either the 'One-Go Retrofit' or 'Stepped Retrofit' limits **shall** be selected and used for all Existing Areas. If the 'Stepped Retrofit' limits are used, a Retrofit Plan (see section 5.2.7) **shall** be provided.

NOTE 2 In buildings where no Retrofit Works are due to take place (either Existing Buildings, or a building with both New Areas and Existing Areas) the same requirements apply as for buildings where Retrofit Works are taking place. Either way, one set of limits must be selected and used across all Existing Areas. This means that where an Existing Building is already low-energy enough to meet the 'Stepped Retrofit' limits at the point of first assessment, those limits may be selected for use, provided the requirements around Retrofit Plans are still followed.

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

The scope of the comparison **shall** be according to the general operational energy assessment scope (see section 5.2.1.2).

The limits for a given New Building **shall** remain the same as those identified based on its first assessment.

NOTE 3 This means that in future re-verifications, the building will have to meet the same limit as when the New Building was originally assessed.

5.2.7 Retrofit Plans

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

- A description of retrofit steps to be undertaken, including building fabric and services works.
- Operational energy performance calculations associated with the retrofit, showing that the building, once retrofitted, is expected to meet the 2040 operational energy Existing Buildings limit, and any applicable interim energy limits (see Annex A). These operational energy calculations should be based on energy performance modelling (not building regulations compliance) following CIBSE TM54:2022 e.g., PHPP, NABERS, or more general TM54 modelling.
- A life cycle embodied carbon assessment of the Retrofit Works, showing that these works would meet the upfront carbon limits (see section 5.1 and Annex A) defined by the Date of Commencement (see section 4.2.6) of the Retrofit or Reportable Works that is planned as part of the current assessment. These calculations **shall** be based on design information and scenarios, and should use best estimate carbon factors for the point in time when the future Retrofit Works will be undertaken.
- A timeline for implementation, and confirmation that the limit set out in Annex A for the year 2040 will be met by 2040 at the latest.

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 assessed, reported and submitted to the verifier.

5.3.1.2 On-site renewable electricity generation assessment scope – general

The scope of on-site renewable electricity generation assessment **shall** only include the following types of on-site electricity generation, whether integrated into the building fabric or elsewhere within the building curtilage:

- Photovoltaics;
- On-site wind turbines;
- On-site hydroelectric turbines.

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

- Excluded from energy use measurements and therefore any relevant limits;
- Reported in module D2 results, according to the RICS PS (see section 5.1) annually.

NOTE As an illustration, if a building were to (1) draw X kWh/m²/year from the national grid, (2) generate and consume renewable electricity generation on-site from solar PV of Y kWh/m²/year, and (3) generate and export renewable electricity generation on-site from solar PV of Z kWh/m²/year – then the building's operational energy use intensity would be (X + Y) kWh/m²/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 m² building footprint area[a] targets [kWh/m² building footprint[a]/year]	Total annual on-site renewable electricity generation [kWh/year] Annual on-site renewable electricity generation that is used on site [kWh/year] Annual on-site renewable electricity generation that is exported [kWh/year] On-site renewable electricity generation capacity [kWp/ m² building footprint[a]]

[a] Building footprint area refers to the area of land covered by a building at ground level, including any overhanging parts of the building above ground level. It is measured to the outer face of the external walls and includes any attached structures such as garages, porches, and conservatories.

5.3.3 Assessed period

The assessed period **shall** be the ORP (see section 4.2.4).

5.3.4 Submission requirements

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

- On-site renewable electricity generation used on site: Total expressed according to the relevant unit(s) (see section 5.3.2);
- On-site renewable electricity generation exported: Total expressed according to the relevant unit(s) (see section 5.3.2);
- On-site renewable electricity generation capacity (see section 5.3.2)
- A statement confirming how the annual renewable electricity generation has been measured and reported;
- Details of constraints affecting on-site renewable electricity generation;
- Details justifying the reduction of the on-site renewable electricity generation target if applicable (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

Comparison with the applicable on-site renewable electricity generation target (see Annex A), applicable to the sector (see section 4.2.2), number of storeys and location, **shall** be carried out and the requirements of the target **shall** be met.

A reduced renewable generation target is permissible due to the following constraints. The maximum contribution to the limit possible, taking the following allowable constraints into account:

- 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);
- Overshadowed roofs;
- Grid connectivity constraints (e.g., limited access to the electrical grid, or grid capacity issues in the local area).

If any of the above constraints are applicable, a statement **shall** be provided with supporting calculations stating how these reduce the feasible target to a reasonable optimum value. The requirements 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 or hydropower).

If constraints restrict on-site renewable electricity generation capacity to a system less than 1 kWp on Single Family Homes and 4 kWp on all other buildings, as evidenced through the statement, the renewable electricity target **shall not** apply.

If the building's in-scope annual operational electricity use (see section 5.2.1.2) is less than the applicable on-site renewable electricity generation target, the target may be reduced to equal the building's in-scope annual operational electricity use.

If there is no roof associated with the building then this target does not apply.

Existing buildings **shall** follow the same approach as set out in section 5.3.5.1 with the following additional constraints:

- Access (e.g., for installation and maintenance);
- Structural capacity (e.g., the building's ability to bear the load of a system);
- Existing plant areas (if solar PV cannot be installed on top of the plant);
- Existing rooflights.

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 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.

The following uses may be excluded

- Manufacturing, production, waste treatment or other industrial processes;

NOTE 'Industrial process' refers to chemical, physical, electrical, or mechanical processes during the production or manufacture of products.

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] • Annual operational water use per m^2 GIA [m^3/m^2 GIA/year] • Annual operational water use carbon emissions per m^2 GIA [$kgCO_2e/m^2$ GIA/year] Also • For Homes and Offices – Litres per person per day [l/person/day] • For Schools – Annual operational water use per pupil per year [m^3/pupil/year] • For Data Centres – Water Use Effectiveness (WUE) [WUE]

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
Other sources	Meter readings (per source)

5.4.3 Assessment methodology

5.4.3.1 Carbon emissions from operational water

The carbon emissions from water use from all sources **shall** be calculated by multiplying the water consumption over the assessment period by the appropriate carbon emission factor.

The UK Government Conversion Factors for Company Reporting of Greenhouse Gas Emissions, full set (for advanced users) (see section 2) available at the RPEP (see section 4.2.4.1), **shall** be used to calculate the carbon emissions from operational water use as follows:

- The water supply carbon emission factor ($kgCO_2e$) **shall** be used for all water supplied by the network water supplier;
- The water treatment carbon emission factor **shall** be used for all water supply disposed of via the network water supplier's drains.

5.4.4 Assessed period

The assessed period **shall** be the ORP (see section 4.2.4).

5.4.5 Submission requirements

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

- Water use total and per source type breakdowns, expressed according to the relevant unit(s) (see section 5.4.2), 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.

5.5 Fossil fuel free

The Standard generally precludes the use of fossil fuels (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), fossil fuel use on site use **shall** be assessed, reported and submitted to the verifier.

5.5.1.2 Fossil fuel free assessment scope – general

The scope of assessment for fossil fuel use on site **shall** include all fossil fuel use by the building, with exclusions in the following instances:

- 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 1998:2004+A1:2013;
- Essential back-up systems serving data centres or critical server infrastructure in Offices, if the reliance on fossil fuel use has been minimised i.e. consideration should be given to technical design note(s) showing that no other options are commercially available/viable;
- Fossil fuels used in construction process (typically reported under module A5.2).

NOTE BS EN 1998:2004+A1:2013 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 1990:2002+A1:2005, 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).

5.5.2 Assessment methodology

5.5.2.1 General

All fossil fuel use on site **shall** be identified based on a review of the following:

- Drawings, specifications and other records relating to energy using systems and processes;
- Meter reading records or billing information.

5.5.2.2 Plant supplying energy to multiple buildings

Fossil fuel use by the building **shall** include fossil fuel use by plant supplying energy to the building under assessment, as well as other buildings, if:

- 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 ORP (see section 4.2.4).

5.5.4 Submission requirements

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

- A statement confirming there is no in-scope (see section 5.5.1.2) fossil fuel use on site.
- If there is fossil fuel use on site, evidence that this is for uses excluded from the scope (see section 5.5.1.2). Evidence of this should include:
  - Drawings, specifications and other records relating to energy using systems and processes;
- Meter reading records or billing information.

5.5.5 Pass/fail requirement

No fossil fuels **shall** be used on site for uses within the general assessment scope (see section 5.5.1.2).

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 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 all sectors, except for the following:

- Individual Single Family Homes (however blocks of flats and schemes with multiple Single Family Homes still require assessment)
- Any buildings with a total floor area of ≤500m^2 GIA

The scope of electricity demand management assessment **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
≤1 hour between readings	Date/time and electricity demand [kW] of all periods in the 99th percentile of energy demand Date/time and electricity demand [kW] of all periods in the 50th percentile of energy demand Date/time and electricity demand [kW] of all periods in the 1st percentile of energy demand
Other	None

5.6.3 Measurement methodology

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

5.6.4 Assessed period

The assessed period **shall** be the ORP (see section 4.2.4).

5.6.5 Submission requirements

Assessment evidence and reporting for submission to the verifier **shall** include the following, where applicable to the assessment:

- Details of electricity use that is not metered or where the meter does not enable the required reporting;
- Meter readings and other electricity demand management data (see section 5.6.3).

5.6.6 Limits

No limits/targets have currently been set for electricity demand management in this version of the Standard.

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 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 or cooling network, the operational energy use, carbon emissions and carbon content of heat/coolth from the district heating and/or cooling network **shall** be assessed, reported and submitted to the verifier.

For the carbon content of heat/coolth from the district heating and/or cooling network, comparison with limits **shall** be carried out according to section 5.7.5 and the requirements of the limits **shall** be met.

5.7.1.2 District heating and cooling network assessment scope – general

The scope of the district heating and cooling network assessment **shall** include any district heating and cooling networks connected to the building.

5.7.2 Metrics

The metrics for assessment, reporting and comparison with the district heating and cooling network 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 limit for heat/coolth supplied [kgCO_2e/kWh]	Energy used by the district energy scheme, associated with heat/coolth supplied [kWh/m^2/yr] 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 district heating and cooling networks **shall** be measured by a heat meter(s) at the connection to the building.

5.7.3.2 Carbon emissions assessment

The carbon emissions factor 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 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 ORP (see section 4.2.4).

5.7.5 Submission requirements

Assessment evidence and reporting for submission to the verifier **shall** include the following, where applicable to the assessment:

- 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 district heating or cooling network 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 carbon calculations.

And, if the district heating or cooling network currently supplies (or will supply) heat from fossil fuels, details on the network's plan to supply heat that is not from fossil fuels by 2040 **shall** be submitted, including the following:

- 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 supplied, demonstrating that the network will meet the district heating or cooling network limit;
- A written statement confirming that the network will not use fossil fuels by 2040 and that it will meet the relevant carbon intensity limit in the interim;
- How the decarbonisation plan is incorporated into the network's business model;
- A written commitment to implement the plan which should be published publicly on the company's website, alongside regular reviews of progress towards fossil fuel free heat.

5.7.6 Limits and pass/fail requirements

5.7.6.1 District heating and cooling network limits – general

For the carbon content of heat/coolth from the district heating and/or cooling network, comparison with limits **shall** be carried out and the requirements of the limits **shall** be met.

The limits **shall** be calculated in accordance with the methodology set out in section 5.2.3.6, or where heat is from CHP, section 5.2.3.7, following the requirements of sections 5.7.6.2 and 5.7.6.3. The carbon content of heat/coolth limits will evolve over time, to reflect the evolution of the grid

(whether for newly verified or re-verified schemes). In any given year, the limit **shall** be set using that year's carbon content of the grid as per the most recently available version of the UK Government Conversion Factors for Company Reporting of Greenhouse Gas Emissions, full set (for advanced users) (see section 2) available at the RPEP (see section 4.2.4.1).

The scope of the comparison **shall** be according to the general district heating and cooling network assessment scope (see section 5.7.1.2).

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 District heating and cooling network limits and pass/fail requirements – existing networks

From 1st January 2040, heat/coolth supplied by existing district heating or cooling network to the building **shall not** come from fossil fuels.

If the district heating or cooling network currently supplies heat/coolth from fossil fuels, the network **shall** have a robust plan (see section 5.7.5) already in place to stop supplying heat/coolth from fossil fuels by this date.

A district heating or cooling network is considered existing if in operation or under construction on or before the date of the first issued version of this Standard.

A network is considered to be under construction if one or more of the following apply:

- The construction of the building intended to house the energy centre has not been completed;
- Excavation for pipework has not been completed.

A network is also considered to be under construction if not yet in operation, and one or more of the following apply:

- The building intended to house the energy centre has been constructed;
- There is a heat/coolth offtake agreement signed between the network and a third party;
- Excavation for pipework has been completed.

The carbon content of heating limit for an existing network **shall** be calculated using the following:

- District energy scheme with Air Source Heat Pump and CIBSE Code of Practice 1 losses, assuming ASHP SCOP = 2.8
- Primary distribution losses = 20% (i.e. CP1 limit)
- Parasitic energy (% of heat fed into the network) = 2%

To calculate the carbon content of coolth limit for an existing network, the following assumptions **shall** be made:

- On-site chiller, assuming Chiller SEER = 3

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 District heating and cooling network limits – new networks and pass/fail requirements

Heat/coolth supplied by a new district heating or cooling network to the building **shall not** come from fossil fuels.

The carbon content of heating limit for a new network **shall** be calculated using the following:

- On-site ASHP, assuming ASHP SCOP = 2.8
- Primary distribution losses = 0%
- Parasitic energy = 0%

To calculate the carbon content of coolth limit for a new network, the following assumptions **shall** be made:

- On-site chiller, assuming Chiller SEER = 3

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

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

The scope of the heating and cooling delivered to the building **shall** include all energy use by the building for the following functions only:

- Space heating delivered to the building;
- Space cooling delivered to the building.

NOTE Heating and cooling of spaces not intended to be occupied are excluded (e.g., cold rooms).

5.8.1.3 Limits

Comparison with limits for space heating and/or cooling delivered to the building (see Annex A), applicable to the sector (see sections 4.2.2), **shall** be carried out and the requirements of the limit **shall** be met, for the following building types:

- New Buildings.

NOTE In this version of the Standard, only New Buildings and some sectors have limits associated with space heating and / or cooling 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.

The scope of the comparison **shall** be according to the general heating and cooling delivered to the building scope (see section 5.8.1.3).

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

Pass/fail metric(s) name and unit
Annual space heating delivered to the building limit [kWh/m^{2}GIA/year][a]
Annual space cooling delivered to the building limit [kWh/m^{2}GIA/year][a]
Peak energy delivered for space heating limit [W/m^{2}GIA]

Peak energy delivered for space cooling limit [W/m^{2}GIA]

[a] Floor area figure used in calculation of metrics to only include occupied spaces, as set out in section 5.8.1.3

5.8.3 Measurement methodology

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

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

The floor area measurement convention for each sector **shall** be aligned to operational energy metrics (i.e. GIA for all sectors except Offices which uses NIA).

5.8.4 Assessed period

The assessed period **shall** be the ORP (see section 4.2.4).

5.8.5 Limits and pass/fair requirements

Comparison with limits for space heating and/or cooling delivered to the building (see Annex A), applicable to the sector (see sections 4.2.2), **shall** be carried out and the requirements of the limit **shall** be met, for the following building types:

- New Buildings except new Data Centres.

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

Areas of the building classified as sectors/subsectors that do not have limits for space heating and/or cooling delivered to the building are exempt from meeting the limits (see also section 5.8.3 regarding sub-metering). Only areas classified as sectors/subsectors with limits **shall** be used in Equation 1.

The scope of the comparison **shall** be according to the general heating and cooling delivered to the building scope (see section 5.8.1.3).

5.8.6 Submission requirements

Assessment evidence and reporting for submission to the verifier **shall** include the following, where applicable to the assessment:

- Details of spaces that are heated or cooled that are not occupied and are excluded from the scope (see section 5.8.1.3);
- 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 sub-metering;

- 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, sub-metered 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 fixed air conditioning, fixed heat pumps and other fixed refrigeration systems (e.g., for cold storage) with the following exclusion:

- Refrigeration equipment that is used in an industrial process.

NOTE 'Industrial process' refers to chemical, physical, electrical, or mechanical processes during the production or manufacture of products.

Refrigerants in all in scope systems must meet the GWP limits set out in Annex A in accordance with section 5.9.6.

In addition, where in scope systems within the building collectively contain refrigerant equivalent to 3,000 $kgCO_2e$ or more (see Equation 5), the carbon impact of refrigerant leakage must be assessed and reported in accordance with sections 5.9.3.

Equation 5 Refrigerant charge in the building

Building refrigerant charge ($kgCO_2e$) = RC_1 x GWP_1+ RC_2 x GWP_2 ....+ RC_n x GWP_n

Where

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

NOTE 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.

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 limit of refrigerants [$kgCO_2e/kg$]	N/A

Annual carbon equivalent of refrigerant gas leakage (only where in scope systems within the building collectively contain refrigerant with a carbon equivalent of 3,000 kg CO_2e or more.)	N/A	Annual carbon impact of refrigerant gases – Kyoto products only [$kgCO_2e$/year] Optional reporting metric: Annual carbon impact of refrigerant gases per m^2 GIA [$kgCO_2e$/year] (non-Kyoto products only)

5.9.3 Assessment methodology

For each refrigerant gas included in the scope (See sections 5.9.1.2 and 5.9.3) the carbon impact of refrigerant leaked during the assessed period (See section 5.9.4) **shall** be separately measured and reported according to Equation 6. If the data necessary for Equation 6 is not available, refrigerant leakage may be measured according to Equation 7.

Equation 6 Refrigerant leakage quantity – change in quantity approach

$$L = S + A – E$$

Where:

- L = The mass of refrigerant leakage (kg) during the assessed period;
- S = The total mass (kg) of refrigerant in the system at the assessed period start point;
- A = The total mass of refrigerant (kg) that is added to the refrigeration system during the assessed period;
- E = The total mass (kg) of the refrigerant in the system at the assessed period end point.

Equation 7 Refrigerant leakage quantity – quantity added approach

$$L = A$$

Where:

- L = The assumed mass of refrigerant leakage (kg) during the assessed period;
- A = The mass of refrigerant (kg) added to the refrigeration system during the assessed period.

The carbon equivalent impact of refrigerant leakage determined by Equation 6 or Equation 7 **shall** be calculated according to Equation 8.

Equation 8 Carbon emissions from refrigerant leakage

$$E = L \times GWP$$

Where:

- E = Carbon emissions during the assessed period due to refrigerant leakage;
- L = the mass of refrigerant leakage (kg) during the assessed period (see above);
- GWP = The GWP ($kgCO_2e$/kg) of the refrigerant.

The carbon impact of refrigerant leakage **shall** be assessed and reported for the assessed period (see section 5.9.4).

The “only Kyoto products” values from most recently available version of the UK Government Conversion Factors for Company Reporting of Greenhouse Gas Emissions, full set (for advanced users) (see section 2) available at the RPEP (see section 4.2.4.1), **shall** be used to calculate the carbon impacts of refrigerant leakage.

The “non-Kyoto products” values from most recently available version of the UK Government Conversion Factors for Company Reporting of Greenhouse Gas Emissions, full set (for advanced users) (see section 2) available at the RPEP (see section 4.2.4.1), should be used to calculate the carbon impacts of refrigerant leakage.

5.9.4 Assessed period

The assessed period **shall** be the ORP (see section 4.2.4).

5.9.5 Submission requirements

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

- Refrigerant leakage and carbon emission total and per refrigerant type breakdowns, expressed according to the relevant unit(s) (see section 5.9.2);
- Data used for and calculation of refrigerant leakage quantities and carbon emissions (see section 5.9.3;
- Carbon emission factors used (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 [kg];
- 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 meet the limit (see section 5.9.6).
- Calculations used to determine the carbon equivalent of refrigerants contained in all in scope refrigeration systems in the building.

5.9.6 Limits

The refrigerant gas contained in each in-scope refrigerant system (See section 5.9.1.2) **shall** meet the GWP limit for the relevant refrigeration system type (See Annex A).

An exception to the limits may be made where:

- Systems were installed before the release of the Standard and no works on the refrigeration system have been carried out since the release of the Standard.

This exclusion will only apply where the RPEP occurs prior to 1st January 2030.

The “only Kyoto products” values from the most recently available version of the UK Government Conversion Factors for Company Reporting of Greenhouse Gas Emissions, full set (for advanced users) (see section 2) available at the RPEP (see section 4.2.4.1), **shall** be used to determine whether the GWP limit has been met (See Annex A).

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).

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 (see section 4.3.3).

NOTE If no carbon offsetting is undertaken for the building or works (see section 4.3.2), the requirements in this section 5.10 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 carbon emissions occurring for works that achieve practical completion during the ERP (see section 5.1), and for all in-use emissions occurring during the ORP (see sections 0 to 5.9), 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 – Kyoto products only (see section 5.9.3).

5.10.2 Carbon offsetting methodology

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.

NOTE 1 At the time of writing, no ICVCM Core Carbon Principle-labelled credits are yet available. This is a relatively new credits programme.

The vintage (year) of the carbon credits **shall** be no more than five years before or after the RPEP (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 4.2.4;
- 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 GHG Protocol Scope 2 emissions from electricity supplied via the grid. GHG 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 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 allowed carbon offsets **shall** be equal to the total reported 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 and conformity (for information)

To demonstrate conformity to the Standard, buildings will undergo verification.

This verification section of the Standard will set out a methodology for a third-party verifier/verification team to verify the building has met the specific limits, targets and requirements set by the Standard, relevant to the type of building, works, and sector (see sections 4.2.1 and 4.2.2) .

The technical verification requirements have been developed, and will be released separately following the finalisation of the verification administration requirements.

6.1 Verification principles (for information)

The principles below are the basis of the verification requirements.

1. Verification will occur at the following points:
    a. **First Verification** - After the building has been operating at agreed occupancy levels for at least the preceding 12 months. This will capture all required operational data for the *Operational Reporting Period* and all required embodied carbon for the *Embodied Reporting Period*, and;
    b. **Ongoing Verification** – Typically annually thereafter capturing all required operational and embodied carbon data (see section 4.2.4 for when gaps in reporting occur).
2. At the end of a building's first RPEP (see section 4.2.4.1) the claimant/net-zero carbon coordinator will collate all building performance data and relevant reporting evidence for submission (see section 4.2.7 and individual submissions with sections 5.1 to 5.10) and **submit** to the third party verifier/verification team;
3. Within an agreed timespan, verification will occur, during which the verifier/verification team can request further evidence as necessary from the claimant (e.g., the full RICS PS report and accompanying as-built evidence);
4. At the point of a successful verification, the claimant will publicly disclose their performance data to UK NZCBS Ltd by **lodging** their verified performance data via a dedicated NZCBS reporting format within the BECD. They will be able to publicly declare their building in accordance with section 4.3 of the Standard.
5. There will be accompanying documentation that can be published to market the building as having been verified;

6. There will be no interim validation/verification allowed, nor public declaration allowed, at Practical Completion in this version of the Standard. The first verification and public declaration point will be as described above.

The final processes for verification against the Standard, including final timelines (see Figure 7), are being considered and will be communicated in due course.

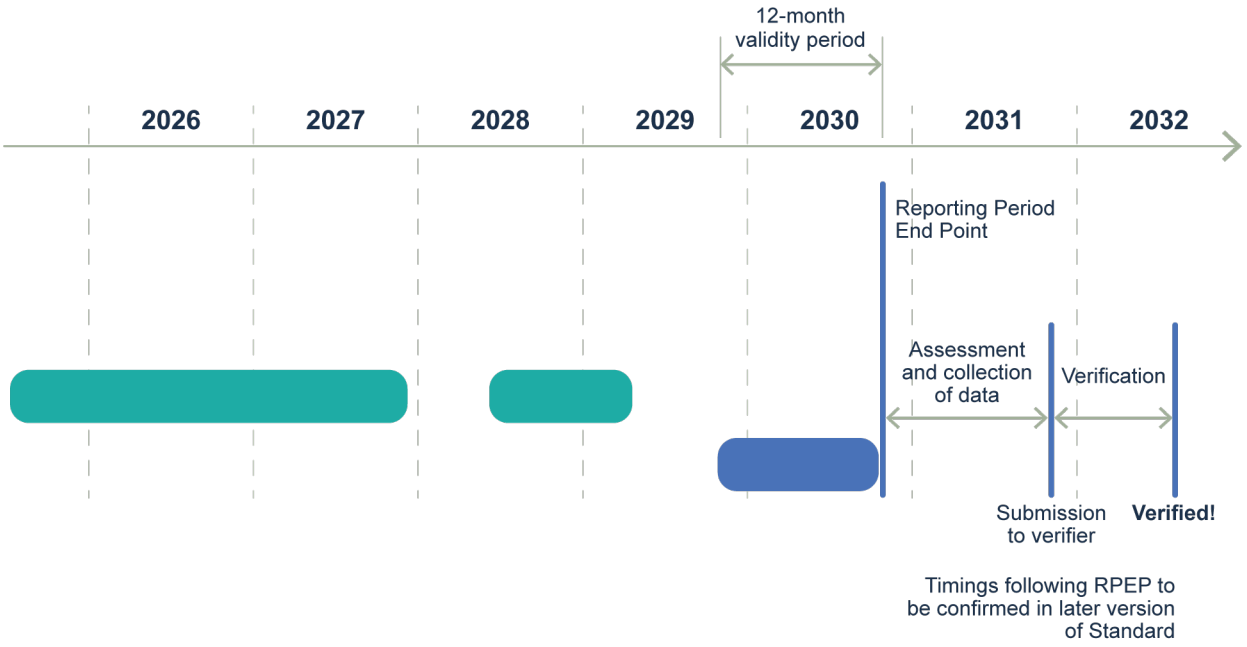


Figure 7 Expected process from RPEP to end of verification process

7. Communication (for information)

Section to be added as part of a future version of this Standard.

Annex A: Limits and targets

A1 Embodied carbon limits

Table EC-1: Upfront carbon limits, New Works

← Date of Commencement on site	Commercial Residential	Culture, Worship & Entertainment		Data Centres	Healthcare	Higher Education	Homes		Hotels	Offices		Retail	School	Science & Technology	Sport & Leisure	Storage & Distribution
	-	General	Performance Spaces	-	-	-	Single family homes	Flats	-	Whole building	Shell and core	-	-	-	-	-
	$kgCO_2e/m^2GIA$															
2025	580	570	855	745	790	640	430	565	670	735	475	715	530	755	820	635
2026	550	540	810	705	750	610	400	525	635	700	450	680	505	715	780	605
2027	525	515	770	670	710	575	375	490	605	660	425	645	480	680	740	570
2028	495	485	725	635	670	545	345	450	570	625	400	610	450	640	695	540
2029	465	460	685	600	635	515	320	420	540	590	380	575	425	605	660	510
2030	435	425	640	555	590	480	290	380	500	550	355	535	395	565	610	475
2031	405	400	595	520	550	445	270	355	470	515	330	500	370	525	575	445
2032	380	375	560	490	515	420	255	335	440	480	310	470	350	495	535	415
2033	350	340	510	445	475	385	235	305	400	440	285	430	320	450	490	380
2034	315	310	465	405	430	350	210	280	365	400	255	390	290	410	445	345
2035	285	280	420	365	390	315	190	250	330	360	230	350	260	370	405	315
2036	260	255	380	330	350	285	175	225	300	325	210	320	235	335	365	280
2037	240	235	350	305	325	265	160	210	275	300	190	295	220	310	335	260
2038	220	215	325	280	300	240	150	195	255	280	180	270	200	285	310	240
2039	200	200	295	260	275	225	135	175	235	255	165	250	185	260	285	220
2040	185	180	270	235	250	205	125	160	215	235	150	225	170	240	260	200
2041	165	165	245	215	225	185	110	145	195	210	135	205	155	215	235	185
2042	150	150	220	195	205	165	100	135	175	190	120	185	140	195	210	165
2043	135	135	200	175	185	150	90	120	155	170	110	165	125	175	190	150
2044	120	120	175	155	165	135	80	105	140	150	95	150	110	155	170	130
2045	105	105	155	135	145	115	70	95	125	135	85	130	100	140	150	115
2046	95	90	135	120	125	105	65	80	105	120	75	115	85	120	130	100
2047	80	80	120	105	110	90	55	70	95	100	60	100	75	105	115	90
2048	70	70	100	90	95	75	45	60	80	85	55	85	65	90	95	75
2049	60	55	85	75	80	65	40	50	65	70	45	70	55	75	80	65
2050	45	45	70	60	65	50	30	40	55	60	35	60	45	60	65	50
For details of Date of Commencement, see section 4.2.6																

Table EC-2: Upfront carbon limits, Retrofit works

↓ Date of Commencement on site	Commercial Residential	Culture, Worship & Entertainment		Data Centres	Healthcare	Higher Education	Homes		Hotels	Offices		Retail	School	Science & Technology	Sport & Leisure	Storage & Distribution
		General	Performance Spaces				Single family homes	Flats		Whole building	Shell and core					
	$kgCO_2e/m^2GIA$															
2025	460	450	605	525	615	475	270	425	520	600	n/a	500	380	605	655	310
2026	435	425	570	495	585	455	255	395	490	575		475	365	575	620	295
2027	415	405	545	475	555	425	235	370	470	540		450	345	545	590	275
2028	390	385	510	450	525	405	220	340	440	510		425	325	515	555	265
2029	370	365	485	425	495	385	205	315	420	485		400	305	485	525	250
2030	345	335	450	390	460	355	185	285	390	450		375	285	455	485	230
2031	320	315	420	370	430	330	170	270	365	420		350	265	420	460	215
2032	300	295	395	345	405	315	160	255	340	395		330	255	395	430	205
2033	280	270	360	315	370	285	150	230	310	360		300	230	360	390	185
2034	250	245	330	285	335	260	135	210	285	330		275	210	330	355	170
2035	225	220	295	260	305	235	120	190	255	295		245	190	300	325	155
2036	205	200	270	235	275	215	110	170	235	265		225	170	270	295	140
2037	190	185	250	215	255	200	105	160	215	245		205	160	250	270	130
2038	175	170	230	200	235	180	95	150	200	230		190	145	230	250	120
2039	160	160	210	185	215	170	85	135	185	210		175	135	210	230	110
2040	150	145	190	165	195	155	80	120	170	195		160	125	195	210	100
2041	130	130	175	155	180	140	70	110	155	175		145	115	175	190	90
2042	120	120	155	140	160	125	65	105	135	155		130	105	160	170	80
2043	110	110	145	125	145	115	60	90	120	140		115	90	140	155	75
2044	95	95	125	110	130	100	55	80	110	125		105	80	125	140	65
2045	85	85	110	95	115	85	45	75	100	110		95	75	115	120	60
2046	75	75	95	85	100	80	45	60	85	100		80	65	100	105	50
2047	65	65	85	75	90	70	35	55	75	85		70	55	85	95	45
2048	60	55	75	65	75	60	30	45	65	70		60	50	75	80	40
2049	50	45	60	55	65	50	30	40	55	60		50	40	60	65	35
2050	40	40	50	45	55	40	20	30	45	50		45	35	50	55	25
For details of Date of Commencement, see section 4.2.6																

Table EC-3: Upfront carbon limits, Reportable works

← Date of Commencement on site	Commercial Residential	Culture, Worship & Entertainment	Data Centres	Healthcare	Higher Education	Homes	Hotels	Office	Retail	School	Science & Technology	Sport & Leisure	Storage & Distribution
	$kgCO_2e/m^2GIA$												
2025	To be confirmed once sufficient data lodged via the Standard							260	To be confirmed once sufficient data lodged via the Standard				
2026								250					
2027								235					
2028								225					
2029								210					
2030								195					
2031								185					
2032								170					
2033								155					
2034								145					
2035								130					
2036								115					
2037								110					
2038								100					
2039								90					
2040								85					
2041								75					
2042								70					
2043								60					
2044								55					
2045								50					
2046								45					
2047								40					
2048								30					
2049								25					
2050								25					
For details of Date of Commencement, see section 4.2.6													

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

Date of Commencement on site	Commercial Residential	Culture, Worship & Entertainment	Data Centres	Healthcare	Higher Education	Homes	Hotels	Office	Retail	School	Science & Technology	Sport & Leisure	Storage & Distribution
2025	To be confirmed once sufficient data lodged via the Standard												
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													
For details of Date of Commencement, see section 4.2.6													

Upfront carbon limit for renewables

Photovoltaics electricity generation systems: 750 $kgCO_2e/kWp$ limit

Wind turbines and hydroelectric electricity generation systems: No limit

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 section 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 Tables OE-1 to OE-3.

Retrofit "step by step":
Not achieving the end point limit on 1st verification, but with a Retrofit Plan and improvements over time to meet the intermediate limits and the end point limit by 2040.

Retrofit "in one go": *achieving the end point limit from its 1st verification. Limits are fixed based on the time the retrofit commenced onsite i.e. once verified as a Retrofit using the "in one go" limit, a building will retain the same operational energy limit in future verifications.*

New build:
Limits are fixed based on the time the development commenced onsite i.e. once verified as a New Build, a building will retain the same operational limit in future verifications.

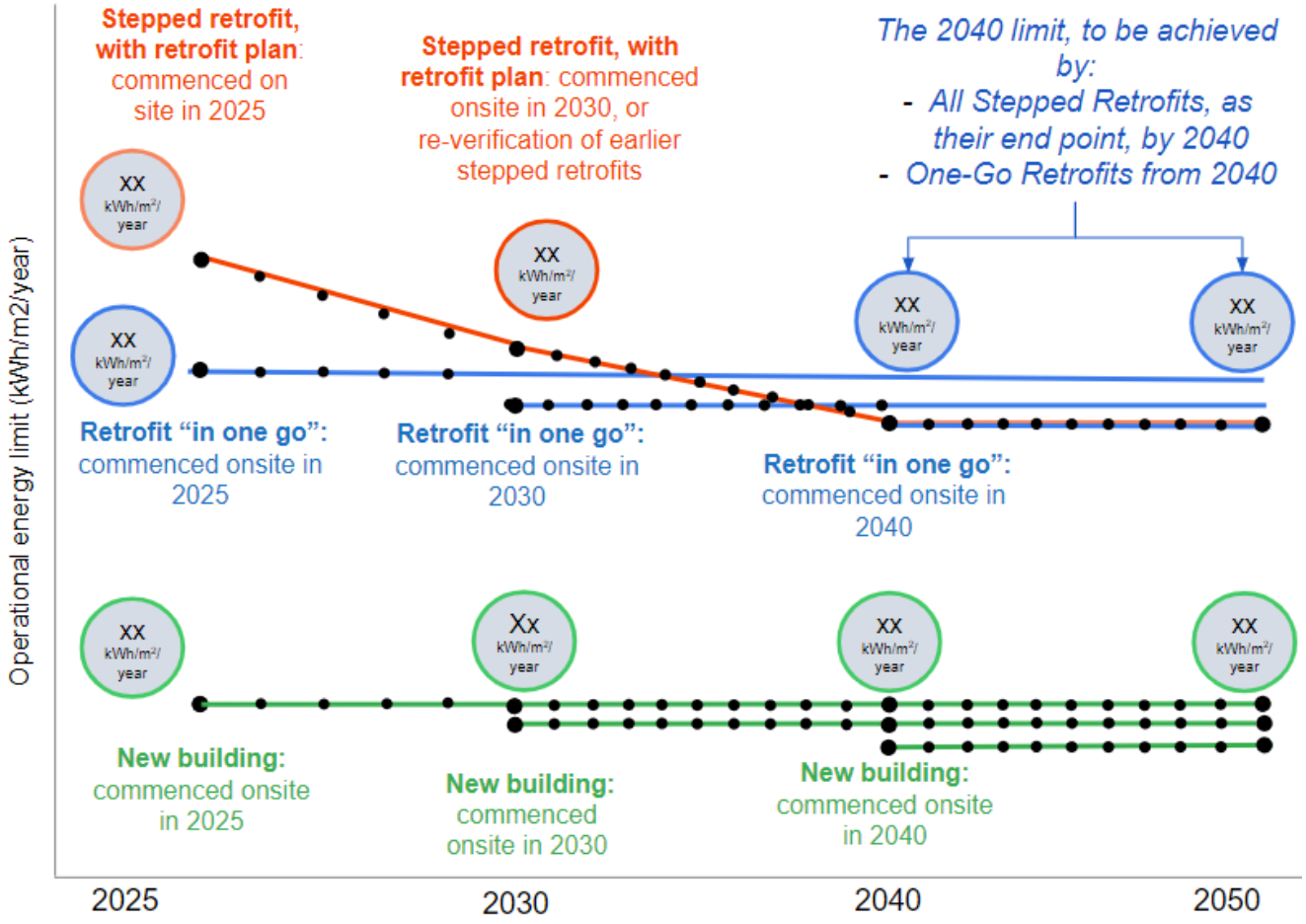


Figure 8 Approach taken to operational energy limits (for information)

Table OE-1: Energy use intensity limits, New Building

↓ Date of Commencement on site	**Commercial Residential**		**Culture & Entertainment**			**Data Centres**		**Healthcare**	**Higher Ed.**	**Homes**		**Hotels**	**Offices** (either /GIA or /NIA metrics may be used)				**Retail**						**Schools**			**Science & Tech.**	**Sport & Leisure**			**Storage & Distribution**		
	Student resi.	Care homes	Performance	Collection	Archives	Low utilisation	High utilisation	-	-	Single family homes	Flats	-	General		Call Centres		Trading Floors		Supermarket	High street retail, dept. store	F&B without catering[a]	F&B with catering[b]	Landlord areas[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	As per NHS-NZ Standard	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/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	kWh/m²GIA/yr
2025	75	150	80	60	5	1.4	1.2		100	45	40	125	85	107	127	159	147	184	200	70	215	380	55	80	50	45	60	305	80	350	150	35	80	160
2026	74	147	79	59	5	1.4	1.2		98	45	40	122	83	104	123	154	143	179	194	68	209	370	54	78	50	45	59	297	79	344	148	34	78	154
2027	72	144	77	58	5	1.39	1.19		95	44	40	119	80	100	119	149	138	173	188	66	202	359	53	75	49	44	58	289	78	337	145	33	75	148
2028	70	140	75	56	5	1.38	1.18		92	43	39	116	77	97	115	144	133	167	182	63	195	348	52	72	48	43	57	280	76	330	142	32	72	141
2029	69	137	74	55	5	1.38	1.18		90	43	39	113	75	94	111	139	128	160	176	61	189	338	51	70	48	43	56	272	75	324	140	31	70	135
2030	67	134	72	54	5	1.37	1.17		87	42	39	110	72	90	106	133	123	154	170	59	182	327	50	67	47	42	55	264	74	317	137	30	67	129
2031	65	130	70	52	5	1.36	1.16		84	41	38	107	69	87	102	128	118	148	164	56	175	316	49	64	46	41	54	255	72	310	134	29	64	122
2032	64	127	69	51	5	1.36	1.16		82	41	38	104	67	84	98	123	113	142	158	54	169	306	48	62	46	41	53	247	71	304	132	28	62	116

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

For details of Date of Commencement, see section 4.2.6

← Date of Commencement on site	Commercial Residential		Culture & Entertainment			Data Centres		Healthcare	Higher Ed.	Homes		Hotels	Offices (either /GIA or /NIA metrics may be used)				Retail						Schools			Science & Tech	Sport & Leisure			Storage & Distribution		
	Student resi.	Care homes	Performance	Collection	Archives	Low utilisation	High utilisation		-	Single family homes	Flats	-	General		Call Centres		Trading Floors		Supermarket	High street retail, dept. store	F&B without catering[a]	F&B with catering[b]	Landlord areas[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	As per NHS-NZ Standard	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/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	kWh/m²GIA/yr
2033	62	124	67	50	5	1.35	1.15		79	40	38	101	64	80	94	118	109	137	152	52	162	295	47	59	45	40	52	239	70	297	129	27	59	110
2034	60	120	65	48	5	1.34	1.14		76	39	37	98	61	77	90	113	104	130	146	49	155	284	46	56	44	39	51	230	68	290	126	26	56	103
2035	59	117	64	47	5	1.34	1.14		74	39	37	95	59	74	85	107	99	124	140	47	149	274	45	54	44	39	50	222	67	284	124	25	54	97
2036	57	114	62	46	5	1.33	1.13		71	38	37	92	56	70	81	102	94	118	134	45	142	263	44	51	43	38	49	214	66	277	121	24	51	91
2037	55	110	60	44	5	1.32	1.12		68	37	36	89	53	67	77	97	89	112	128	42	135	252	43	48	42	37	48	205	64	270	118	23	48	84
2038	54	107	59	43	5	1.32	1.12		66	37	36	86	51	64	73	92	84	105	122	40	129	242	42	46	42	37	47	197	63	264	116	22	46	78
2039	52	104	57	42	5	1.31	1.11		63	36	36	83	48	60	69	87	79	99	116	38	122	231	41	43	41	36	46	189	62	257	113	21	43	72
2040	50	100	55	40	4	1.3	1.1		60	35	35	80	45	57	64	80	74	93	110	35	115	220	40	40	40	35	45	180	60	250	110	20	40	65
2050	50	100	55	40	4	1.3	1.1		60	35	35	80	45	57	64	80	74	93	110	35	115	220	40	40	40	35	45	180	60	250	110	20	40	65

[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] in this Pilot version, this is only for use in commercial centres / shopping centres, to create area-weighted whole building limits, using the landlord areas and retail mix
For details of Date of Commencement, see section 4.2.6

Table OE-2: Energy use intensity limits, Existing Building with One-Go Retrofit

↓ Date of Commencement on site	**Commercial Residential**		**Culture & Entertainment**			**Data Centres**		**Healthcare**					**Higher Ed.**	**Homes**		**Hotels**	**Offices** (either /GIA or /NIA metrics may be used)						**Retail**						**Schools**			**Science & Tech.**	**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		Call Centres		Trading Floors		Supermarket	High street retail, Department store	F&B without catering [a]	F&B with catering [b]	Landlord areas [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/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	kWh/m²GIA/yr
2025	110	220	130	100	10	1.4	1.2	258	140	162	166	182	130	75	65	180	100	125	191	239	220	275	230	90	250	450	80	100	90	85	95	360	210	500	280	35	100	230
2026	108	216	128	98	10	1.4	1.2	259	140	163	167	182	127	74	65	176	97	122	187	234	216	270	224	87	243	438	79	97	89	84	94	351	206	490	275	34	97	221
2027	106	211	125	96	10	1.39	1.19	259	140	163	167	182	123	73	64	172	94	118	183	229	211	264	217	84	236	425	77	94	88	83	92	341	202	480	270	33	94	211
2028	103	206	122	93	10	1.38	1.18	259	140	163	167	182	119	72	64	168	91	114	179	224	206	258	210	81	228	412	75	90	86	81	90	331	198	470	264	32	90	201
2029	101	202	120	91	10	1.38	1.18	259	140	163	167	182	116	71	63	164	88	110	174	218	201	252	204	78	221	400	74	87	85	80	89	322	194	460	259	31	87	192
2030	99	197	117	89	9	1.37	1.17	259	140	163	167	182	112	70	63	160	85	107	170	213	196	245	197	75	214	387	72	84	84	79	87	312	190	450	254	30	84	182
2031	96	192	114	86	9	1.36	1.16	259	140	163	167	182	108	69	62	156	82	103	166	208	191	239	190	72	206	374	70	80	82	77	85	302	186	440	248	29	80	172
2032	94	188	112	84	9	1.36	1.16	259	140	163	167	182	105	68	62	152	79	99	162	203	186	233	184	69	199	362	69	77	81	76	84	293	182	430	243	28	77	163

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

For details of Date of Commencement, see section 4.2.6

← Date of Commencement on site	Commercial Residential		Culture & Entertainment			Data Centres		Healthcare					Higher Ed.	Homes		Hotels	Offices (either /GIA or /NIA metrics may be used)				Retail						Schools			Science & Tech.	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		Call Centres		Trading Floors		Supermarket	High street retail, Department store	F&B without catering [a]	F&B with catering [b]	Landlord areas [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/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	kWh/m²GIA/yr
2033	92	183	109	82	9	1.35	1.15	259	140	163	167	182	101	66	61	148	76	95	157	197	182	228	177	66	192	349	67	74	80	75	82	283	178	420	238	27	74	153
2034	89	178	106	79	9	1.34	1.14	259	140	163	167	182	97	65	61	144	73	92	153	192	177	222	170	63	184	336	65	70	78	73	80	273	174	410	232	26	70	143
2035	87	174	104	77	8	1.34	1.14	259	140	163	167	182	94	64	60	140	70	88	149	187	172	215	164	60	177	324	64	67	77	72	79	264	170	400	227	25	67	134
2036	85	169	101	75	8	1.33	1.13	259	140	163	167	182	90	63	60	136	67	84	145	182	167	209	157	57	170	311	62	64	76	71	77	254	166	390	222	24	64	124
2037	82	164	98	72	8	1.32	1.12	259	140	163	167	182	86	62	59	132	64	80	140	175	162	203	150	54	162	298	60	60	74	69	75	244	162	380	216	23	60	114
2038	80	160	96	70	8	1.32	1.12	259	140	163	167	182	83	61	59	128	61	77	136	170	157	197	144	51	155	286	59	57	73	68	74	235	158	370	211	22	57	105
2039	78	155	93	68	8	1.31	1.11	259	140	163	167	182	79	60	58	124	58	73	132	165	152	190	137	48	148	273	57	54	72	67	72	225	154	360	206	21	54	95
2040	75	150	90	65	7	1.3	1.1	258	140	162	166	182	75	58	57	120	55	69	127	159	147	184	130	45	140	260	55	50	70	65	70	215	150	350	200	20	50	85
2050	75	150	90	65	7	1.3	1.1	258	140	162	166	182	75	58	57	120	55	69	127	159	147	184	130	45	140	260	55	50	70	65	70	215	150	350	200	20	50	85

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

For details of Date of Commencement, see section 4.2.6

Table OE-3: Energy use intensity limits, Existing Building with Stepped Retrofit

↓ Date of Commencement on site	**Commercial Residential**		**Culture & Entertainment**			**Data Centres**		**Healthcare**					**Higher Ed.**	**Homes**		**Hotels**	**Offices** (either /GIA or /NIA metrics may be used)						**Retail**						**Schools**			**Science & Tech.**	**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		Call Centres		Trading Floors		Supermarket	High street retail, dept. store	F&B without catering [a]	F&B with catering [b]	Landlord areas [c]	Retail warehouse	Early years	Primary	Secondary incl. SEN	-	Dry	Wet	Fitness	Unconditioned storage	Conditioned storage	Cold store
	kWh/m^{2}GIA/yr	kWh/m^{2}GIA/yr	kWh/m^{2}GIA/yr	kWh/m^{2}GIA/yr	kWh/m^{2}GIA/yr	PUE	PUE	kWh/m^{2}GIA/yr	kWh/m^{2}GIA/yr	kWh/m^{2}GIA/yr	kWh/m^{2}GIA/yr	kWh/m^{2}GIA/yr	kWh/m^{2}GIA/yr	kWh/m^{2}GIA/yr	kWh/m^{2}GIA/yr	kWh/m^{2}GIA/yr	kWh/m^{2}GIA/yr	kWh/m^{2}NIA/yr	kWh/m^{2}GIA/yr	kWh/m^{2}NIA/yr	kWh/m^{2}GIA/yr	kWh/m^{2}NIA/yr	kWh/m^{2}GIA/yr	kWh/m^{2}GIA/yr	kWh/m^{2}GIA/yr	kWh/m^{2}GIA/yr	kWh/m^{2}CPA/yr	kWh/m^{2}GIA/yr	kWh/m^{2}GIA/yr	kWh/m^{2}GIA/yr	kWh/m^{2}GIA/yr	kWh/m^{2}GIA/yr	kWh/m^{2}GIA/yr	kWh/m^{2}GIA/yr	kWh/m^{2}GIA/yr	kWh/m^{2}GIA/yr	kWh/m^{2}GIA/yr	kWh/m^{2}GIA/yr
2025	135	290	165	125	20	1.4	1.2	293	159	185	189	206	160	95	85	220	120	150	207	259	238	298	410	120	310	510	100	155	120	110	110	560	300	650	400	70	155	300
2026	131	281	160	121	20	1.4	1.2	291	158	184	188	205	155	93	84	214	116	145	202	253	233	292	392	115	299	494	97	148	117	107	108	537	290	630	387	67	148	286
2027	127	272	155	117	19	1.39	1.19	289	157	182	186	204	149	91	82	207	112	140	197	247	227	284	373	110	288	477	94	141	114	104	105	514	280	610	374	64	141	272
2028	123	262	150	113	18	1.38	1.18	287	156	181	185	202	143	88	80	200	107	134	191	239	220	275	354	105	276	460	91	134	110	101	102	491	270	590	360	60	134	257
2029	119	253	145	109	17	1.38	1.18	284	154	179	183	200	138	86	78	194	103	129	186	233	214	268	336	100	265	444	88	127	107	98	100	468	260	570	347	57	127	243
2030	115	244	140	105	16	1.37	1.17	282	153	178	182	199	132	83	76	187	99	124	181	227	208	260	317	95	254	427	85	120	104	95	97	445	250	550	334	54	120	229
2031	111	234	135	101	15	1.36	1.16	280	152	176	180	197	126	81	74	180	94	118	175	219	202	253	298	90	242	410	82	113	100	92	94	422	240	530	320	50	113	214
2032	107	225	130	97	14	1.36	1.16	277	151	175	179	195	121	78	72	174	90	113	170	213	196	245	280	85	231	394	79	106	97	89	92	399	230	510	307	47	106	200

[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] in this Pilot version, this is only for use in commercial centres / shopping centres, to create area-weighted whole building limits, using the landlord areas and retail mix
For details of Date of Commencement, see section 4.2.6

← Date of Commencement on site	Commercial Residential		Culture & Entertainment			Data Centres		Healthcare					Higher Ed.	Homes		Hotels	Offices (either /GIA or /NIA metrics may be used)						Retail						Schools			Science & Tech.	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		Call Centres		Trading Floors		Supermarket	High street retail, dept. store	F&B without catering [a]	F&B with catering [b]	Landlord areas [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/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	kWh/m²GIA/yr
2033	103	216	125	93	14	1.35	1.15	275	149	173	177	194	115	76	71	167	86	108	165	207	190	238	261	80	220	377	76	99	94	86	89	376	220	490	294	44	99	186
2034	99	206	120	89	13	1.34	1.14	273	148	172	176	192	109	73	69	160	81	102	159	199	184	230	242	75	208	360	73	92	90	83	86	353	210	470	280	40	92	171
2035	95	197	115	85	12	1.34	1.14	270	147	170	174	190	104	71	67	154	77	97	154	193	178	223	224	70	197	344	70	85	87	80	84	330	200	450	267	37	85	157
2036	91	188	110	81	11	1.33	1.13	268	146	169	173	189	98	68	65	147	73	92	149	187	172	215	205	65	186	327	67	78	84	77	81	307	190	430	254	34	78	143
2037	87	178	105	77	10	1.32	1.12	266	144	167	171	187	92	66	63	140	68	85	143	179	166	208	186	60	174	310	64	71	80	74	78	284	180	410	240	30	71	128
2038	83	169	100	73	9	1.32	1.12	263	143	166	170	185	87	63	61	134	64	80	138	173	160	200	168	55	163	294	61	64	77	71	76	261	170	390	227	27	64	114
2039	79	160	95	69	8	1.31	1.11	261	142	164	168	184	81	61	59	127	60	75	133	167	154	193	149	50	152	277	58	57	74	68	73	238	160	370	214	24	57	100
2040	75	150	90	65	7	1.3	1.1	258	140	162	166	182	75	58	57	120	55	69	127	159	147	184	130	45	140	260	55	50	70	65	70	215	150	350	200	20	50	85
2050	75	150	90	65	7	1.3	1.1	258	140	162	166	182	75	58	57	120	55	69	127	159	147	184	130	45	140	260	55	50	70	65	70	215	150	350	200	20	50	85

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For details of Date of Commencement, see section 4.2.6

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

↓ Date of Commencement on site	Commercial Residential		Culture & Entertainment			Data Centres		Healthcare	Higher Education	Homes		Hotels	Offices	Retail					Schools			Science & Technology	Sport & Leisure			Storage & Distribution		
	Student residential	Care homes	Performance	Collection	Archives	Low utilisation	High utilisation			Single family homes	Flats			Supermarket	High street retail unit and Department store	F&B without catering [a]	F&B with catering [b]	Landlord areas [c]	Retail warehouse	Early years	Primary	Secondary incl. SEN	-	Wet	Dry	Fitness	Unconditioned storage	Conditioned storage	Cold store
	kWh/m²GIA/year					n/a		To be confirmed once sufficient data lodged via the Standard		kWh/m²GIA/year		To be confirmed once sufficient data lodged via the Standard																	
2025	15	15	15	15	15					20	15																		
2026	15	15	15	15	15					20	15																		
2027	15	15	15	15	15					20	15																		
2028	15	15	15	15	15					20	15																		
2029	15	15	15	15	15					20	15																		
2030	15	15	15	15	15					20	15																		
2031	15	15	15	15	15					20	15																		
2032	15	15	15	15	15					20	15																		

[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] in this Pilot version, this is only for use in commercial centres / shopping centres, to create area-weighted whole building limits, using the landlord areas and retail mix
For details of Date of Commencement, see section 4.2.6

↓ Date of Commencement on site	Commercial Residential		Culture & Entertainment			Data Centres		Healthcare	Higher Education	Homes		Hotels	Offices	Retail						Schools			Science & Technology	Sport & Leisure			Storage & Distribution		
	Student residential	Care homes	Performance	Collection	Archives	Low utilisation	High utilisation			Single family homes	Flats				Supermarket	High street retail unit and Department store	F&B without catering [a]	F&B with catering [b]	Landlord areas [c]	Retail warehouse	Early years	Primary	Secondary incl. SEN	-	Wet	Dry	Fitness	Unconditioned storage	Conditioned storage
	kWh/m²GIA/year									kWh/m²GIA/year																			
2033	15	15	15	15	15	n/a		To be confirmed once sufficient data lodged via the Standard		20	15	To be confirmed once sufficient data lodged via the Standard																	
2034	15	15	15	15	15					20	15																		
2035	15	15	15	15	15					20	15																		
2036	15	15	15	15	15					20	15																		
2037	15	15	15	15	15					20	15																		
2038	15	15	15	15	15					20	15																		
2039	15	15	15	15	15					20	15																		
2040	15	15	15	15	15					20	15																		

[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] in this Pilot version, this is only for use in commercial centres, to create area-weighted whole building limits, using the landlord areas and retail mix
For details of Date of Commencement, see section 4.2.6

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/m²** building footprint / year • for all other building types: minimum **30 kWh/m²** building footprint / year
B. Middle and North England, Northern Ireland, Wales	• for Single Family Homes, and single-storey Storage and Distribution: minimum **65 kWh/m²** building footprint / year • for all other building types: minimum **40 kWh/m²** building footprint / year
C. South England*	• for Single Family Homes, and single-storey Storage and Distribution: minimum **75 kWh/m²** building footprint / year • for all other building types: minimum **45 kWh/m²** 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 Solar PV, see section 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 to the current GWP for R32. If the GWP value for R32 changes in the future, 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/pilotversion

Annex C: Principles of equivalence (for information)

C.1 Introduction

The Standard sets requirements for buildings related to measured and/or assessed building data. Since a number of built environment assessment methodologies (henceforth collectively referred to as 'standards/schemes') are also driving buildings towards Net Zero Carbon, or adjacent goals, it is possible that achievement of an existing scheme/standard could be used as evidence to support a building meeting the specific requirements of the Standard.

This Annex sets out how built environment standards/schemes can demonstrate that meeting their requirements is equivalent to meeting specific aspects of the Standard. Over time, this Annex will be updated to contain a schedule of standards/schemes that have demonstrated equivalence, including details of aspects with which they are equivalent.

C.2 Relevance of this Annex

This Annex is likely to be of interest to representatives from Built Environment standards/schemes interested in aligning with the UK Net Zero Carbon Buildings Standard. Representatives from standards/schemes are invited to apply to demonstrate equivalence following the process defined in section C.5. Standards/schemes that are deemed to successfully demonstrate equivalence with the Standard, based on the requirements of section C.3, will be added to a schedule of equivalent standards/schemes (see Table 21).

C.3 Demonstrating Equivalence

For a standard/scheme to be deemed "equivalent" to a specific aspect of the UK Net Zero Carbon Buildings Standard, both its requirements and its level of verification for that requirement need to be equivalent to the Standard's requirements and level of verification. Agreement on demonstration of equivalence will need to be reached on an individual basis for each standard/scheme, and may be subject to conditions. Standards/schemes will need to provide evidence to support the proposed equivalence, and will need to secure agreement from the Standard's technical team. For this version of the Standard the verification requirements are not detailed, therefore demonstrating equivalence with this aspect will only be possible once it becomes available.

Standards/schemes do not need to demonstrate equivalence with all the Standard's requirements, but can select those which are relevant. Equivalence to the Standard will need to be demonstrated separately for each relevant requirement, and its associated verification process.

Standards/schemes will need to evidence their equivalence separately for new buildings/works and for existing buildings or retrofit works, as the Standard's requirements for these are different.

Standards/schemes will need to state the specific sector(s) / subsector(s) with which they are seeking to demonstrate equivalence, and demonstrate equivalence with the relevant metrics and requirements within those sector(s) / subsector(s).

Equivalence is tied to a specific version of the Standard, and a specific version of the standard/scheme in question. Equivalence will need to be updated as new versions of the Standard and/or standard/scheme are published, otherwise it will elapse. Any conditions related to using a standard/scheme for equivalence will be recorded in Table 21, and must be taken into consideration when using a standard/scheme as evidence of meeting an aspect of the Standard.

C.4 Considerations for buildings using equivalent standards/schemes as evidence

Buildings/applicants using a given standard/scheme to demonstrate conformity with an aspect of the Standard (where it has been agreed and is listed in Table 21) can use achievement of the standard/scheme as evidence for the specific requirement, but will still need to meet the other requirements (i.e. those not covered by equivalence) independently.

Buildings seeking to continue to claim conformity with the Standard over time will need to secure ongoing verification as outlined in section 4.2.4. Under their own requirements, some standards/schemes might not require re-verification in this way. However, buildings seeking re-verification against the Standard will need to re-verify within the Standard's defined time periods as noted in section 4.2.4, either using the Standard's methodology, or through re-verifying against the standard/scheme for the new time period.

C.5 Process to apply for and demonstrate equivalence

Standards/schemes seeking to demonstrate equivalence with the UK Net Zero Carbon Buildings Standard can propose to do so using the following steps:

1. Fill out Table 20 to communicate what equivalence is being sought, and the technical basis of the proposed equivalence
2. Submit this to the Standard's technical team via equivalence@nzcbuildings.co.uk
3. Equivalence will then be reviewed and, if possible, agreed between the standard/scheme's representatives and the Standard's technical team
4. A successful demonstration that the requirements are met will result in an update to this Annex to include the scheme/standard, aspects of the Standard for which it has demonstrated equivalence, and any modifications or conditions, in Table 21.

Table 20 Technical requirements for schemes to demonstrate equivalence

Scope of Equivalence		
Aspect	**The UK Net Zero Carbon Buildings Standard's Approach**	**The Applicant Standard/Scheme's proposed scope of equivalence**
Scheme name and version number	Pilot Version	
Sectors covered by the equivalence	For a list of sectors see section 4.2.2.	List the sector(s) or subsector(s) for which the scheme is seeking to demonstrate equivalence.

Building types and works types covered by the equivalence	For a list of building types and works types (e.g., New Building, New Works, Existing Building, Retrofit Works) see section 4.2.1.	List the building types and works types for which the scheme is seeking to demonstrate equivalence.
Technical basis of equivalence – outcome requirements		
Aspect	**Requirement for equivalence with the Standard**	**Basis of Equivalence**
		To be filled out for Applicant Scheme/Standard for each area where equivalence is being proposed. Provide information for each sector/subsector, and building types/works types where the requirements for these vary.
Embodied carbon	Equivalent upfront carbon limit, see section 5.1.6.2.	Explain how the upfront carbon limits are equivalent to the Standard's for the relevant sectors and building types/works types; Explain any detailed points that may need discussion.
	Equivalent upfront carbon scope, see section 5.1.2.4.	Explain how the scope of included carbon modules is equivalent to the Standard's requirement for the relevant sectors and building types/works types; Explain any detailed points that may need discussion.
Operational Energy	Equivalent energy use intensity limit, see section 5.2.6.1	Explain how the energy use limit is equivalent to the Standard's requirement for the relevant sectors and building types/works types; Unless equivalence is also achieved for District Heating / Cooling Networks (see details below), this would only provide equivalence for buildings with on-site systems; Explain any detailed points that may need discussion.
	Equivalent scope of energy supplies included (all energy supplies to be included, including those from on-site renewable energy systems). See sections 5.2.1 and 5.2.3.	Explain how the scope of included energy supplies is equivalent to the Standard's requirement for the relevant sectors and building types/works types;

		Explain any detailed points that may need discussion.
	Equivalent scope of energy uses covered (i.e. most included, except exclusions agreed within the Standard), see section 5.2.1.2.	Explain how the scope of included energy uses is equivalent to the Standard's requirement for the relevant sectors and building types/works types; Explain any detailed points that may need discussion.
On-site renewable electricity generation	Equivalent target for annual on-site renewable electricity generation, see section 5.3.5.1.	Explain how the on-site renewable electricity generation requirement is equivalent to the Standard's requirement for the relevant sectors and building types/works types; Explain any detailed points that may need discussion.
Fossil Fuel Use on Site	No fossil fuel use on site, except agreed exemptions as noted in section 5.5.1.	Explain how the scheme prohibits the use of fossil fuels on site in equivalence with the Standard for the relevant sectors and building types/works types; Explain any detailed points that may need discussion.
District Heating and cooling Networks	Equivalent approach to energy use limits in district heating and cooling networks, including boundaries and allocation of energy use, see section 5.7.6.	Explain how the approach to energy use in district heating and cooling networks is equivalent to the Standard's requirement for the relevant sectors and building types/works types; Explain any detailed points that may need discussion.
	Equivalent limits to carbon emissions associated with heat/coolth supplied for existing district heating and cooling networks, see section 5.7.6.1.	Explain how the scheme limits fossil fuel use in existing district heating schemes in equivalence with the Standard for the relevant sectors and building types/works types; Explain any detailed points that may need discussion.
Refrigerant Global Warming Potential (GWP)	Equivalent limit on refrigerant GWP, see section 5.9.6.	Explain how the refrigerant GWP limit is equivalent to the Standard's requirement for the relevant sectors and building types/works types;

		Explain any detailed points that may need discussion.
Carbon Reporting	Reporting requirements for the following: Upfront embodied carbon 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 - Kyoto products only (see section 5.9.3).	Explain how the reporting is equivalent to the Standard's requirement for each relevant carbon source.
Technical basis of equivalence – verification		
The detailed verification requirements of the Standard are not yet available. The Standard's technical team will work with standards/schemes seeking equivalence as these requirements evolve.		

Table 21 Schedule of equivalent standards/schemes

Standard/Scheme
There are currently no standards/schemes that have demonstrated equivalence. This Annex will be updated with a table upon successful demonstration of equivalence with a standard/scheme.

NOTE Engagement with the NABERS UK scheme is already under way, and applications are open for other standards/schemes to propose equivalence using the process outlined in section C.5.

Annex D: Roles and responsibilities (for information)

The delivery of 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 22 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'.
Net-Zero Carbon Coordinator	This is not a mandatory role within the Standard, however it is recommended that a NZC 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. The NZC 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 lifecycle 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: 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 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 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), but interface 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. 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: • 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. • 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). 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/organisation to which the claimant/NZC Coordinator will submit reporting data to for verification. The skills and qualifications of verifiers will be set out in the future verification section.
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.

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:

- Ability to construct a thermal simulation in an appropriate simulation package (e.g., IES, TAS, DesignBuilder)
- Demonstrable experience undertaking CIBSE TM54, NABERs Design for Performance modelling, CIBSE 61-63 or Display Energy Certificate assessments relating to in-use energy performance
- Ability to identify performance risks that are likely to emerge for the types of building, services and technology covered by their modelling.

Annex E: Contributors (for information)

Technical Steering Group

Jane Anderson (WLCN)

Will Arnold (IStructE)

Clara Bagenal George (LETI) – Chair May 2022 - December 2023

Adam Baranowski (BBP)

Julie Godefroy (CIBSE)

Jess Hrivnak (RIBA)

Christine Pout (BRE)

Tom Wigg (UKGBC)

Katie Clemence-Jackson – Chair December 2023 - October 2024

Matthew Collins (RICS) – May 2022 – August 2023

Nektarios Gkanis (Carbon Trust) – May 2022 - February 2024

Fabrizio Varriale (RICS) August 2023 - present

Sam Wallis February 2024 – present

Governance Board

Chair – David Partridge (Related Argent)

Founding Members

BBP – Sarah Ratcliffe

BRE – Jonathan Rickard

CIBSE – Anastasia Mylona, previous members Hywel Davies & Fiona Cousins

IStructE – Patrick Hayes

LETI – Chris Twinn

RIBA – Judit Kimpian, previous member Duncan Baker-Brown

RICS – Charlotte Neal & Amit Patel

UKGBC – Smith Mordak, previous member Julie Hirigoyen

Observer Members

ICE – Lewis Barlow, previous member David Porter

PIA – Bill Hughes

RIAS – Angel Morales-Aguilar, Chris Stewart

Management, Administrative and Technical Support

Rosie Bard (Orms) – Technical Project Manager, Jan 2024 - Oct 2024

Zoe Black (RIAS) – Project Administrator

Issy Budd (WASPS Studios) – Project Administrator Dec 2023 - Feb 2024

Ellie Burkill (XCO2) – Additional Project Management Support

Faidon Christodoulou – Sector Group Project Manager 2022 - 23

Katie Clemence-Jackson (QODA Consulting) – Technical Project Manager, Jan 2023 – Dec 2024

Daniel Doran (Lifecycle Sustainability) – Technical Writer

Ciara Durkin (Laing O'Rourke) – Technical Secretariat

Gilbert Lennox-King (Construction Carbon) – Interim Project Manager Sep - Dec 2022

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Comms and Stakeholder Engagement Support

Panos Balalas (CIBSE) – Comms support

Matt Broad (Arup) – Communications Lead 2022 - 23

Lesley Graham (RICS) – Graphic Design

Mina Hasman (SOM) – Stakeholder Engagement Lead

Samuel Leeson (RIBA) – Public Affairs

Phoebe MacDonald (RIBA) – Public Affairs

Ruby Oshea (RIBA) – Press Release Coordination

Julia Skeete (SOM) – Stakeholder Engagement Lead

Lynn Urbanik (Passivhaus Trust) – Communications Manager 2024

Lucy Whitman (CIBSE) – Comms support

Task Group 1a – Operational Energy

Julie Godefroy – Head of Net Zero Policy – CIBSE (Task Group Chair)

Adam Baranowski – Climate Change Lead – BBP (Task Group Sub-chair)

Alexia Sofia Charisi – Associate – Savills Earth

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Colin Rees – Associate Director – IES

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NOTE Individuals contributed their expertise to the development of the Standard, however final decisions were made by consensus, thus not all views may be represented in the final output.

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Founding members:
Better Buildings Partnership
Building Research Establishment Ltd
Carbon Trust
Chartered Institute 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

Please access our website for the latest updates and developments
nzcbuildings.co.uk
https://www.linkedin.com/company/uk-nzc-buildings-standard