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Mitsubishi Electric Guide to the UK Net Zero Carbon Buildings Standard (UK NZCBS)

The Future of Low-Carbon HVAC Systems

Information Guide 87

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UK Net Zero Carbon Buildings Standard

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The Future of Low-Carbon HVAC Systems

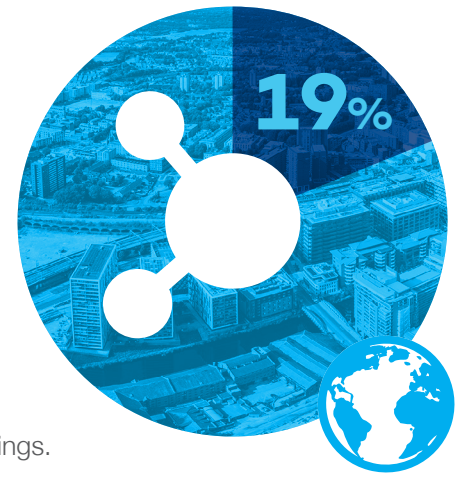
This is an independent guide produced by Mitsubishi Electric to enhance the knowledge of its customers and provide a view of the key issues facing our industry today.

This guide accompanies a series of seminars, all of which are CPD certified.

Contents

Overview and purpose of the UK Net Zero Carbon Buildings Standard

As the UK aims to meet its Net Zero Carbon 2050 goal, reducing emissions in the built environment will be a significant factor for success. The most recent Climate Change Committee Report to Parliament (July 2024) noted that although emissions from buildings are falling, they still represent around **19% of the UK total**.



Building owners and developers are aware of the importance of achieving low-carbon buildings. This is partly driven by legislation such as the Building Regulations and Minimum Energy Efficiency Standards, but also by market demand for sustainable buildings.

However, while there are several accreditations available for sustainable or energy efficient buildings, such as BREEAM or NABERS, there is still no single and agreed definition for a 'Net Zero' building.

This creates a challenge for the construction and property sectors. Without a clear definition, it is difficult to design and construct a new Net Zero building or retrofit an existing building to align with the UK's Net Zero pathway. And for property owners, there is no recognised certification that they can use for marketing a Net Zero building to potential buyers or tenants.

With these issues in mind, several construction industry organisations came together in 2022 to develop an approach that would allow the industry to design, deliver and operate Net Zero buildings. The result is the UK Net Zero Carbon Buildings Standard (UK NZCBS), which launched a Pilot version[1] in September 2024.

The purpose of the Standard is to establish a unified definition for *Net Zero Carbon Aligned Buildings* in the UK, supported by evidence-based reporting. It aims to reduce misleading claims about Net Zero Carbon in buildings and to promote the design, construction, and use of buildings that contribute to the UK's carbon reduction goals.

The UK NZCBS will provide a consistent way to demonstrate how a building aligns with net zero carbon principles, helping the UK real estate sector achieve net zero carbon emissions.

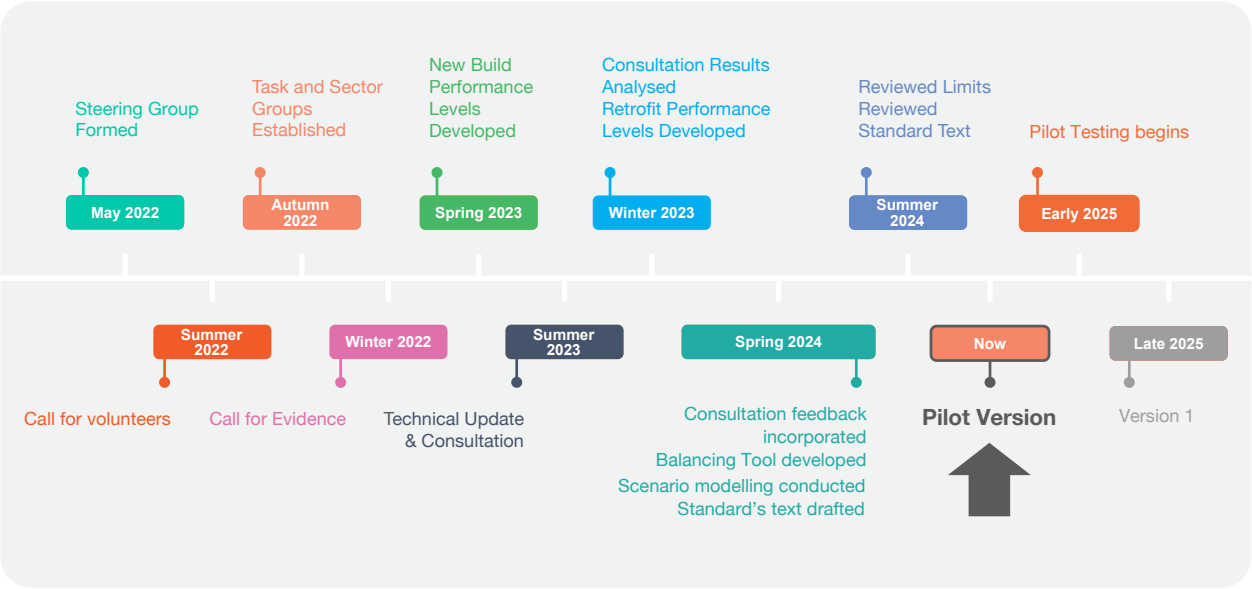
The Standard is aimed at the whole construction sector, since achieving Net Zero in the built environment will require cooperation and information sharing. This includes those involved in the design and delivery of HVAC systems, which will be impacted by several of the Standard's requirements, targets and limits which are discussed in this Guide.

As the Standard states, it is: **"For anyone who wants to either fund, procure, design, or specify a Net Zero Carbon building and anyone wanting to demonstrate that their building is Net Zero Carbon in accordance with an industry-agreed Standard."**

The Standard has four critical principles behind its development:

- It is science-led: The targets and limits in the Standard are designed to enable the built environment to stay within its share of the UK carbon economy and are aligned with the goal of limiting global average temperature rises to 1.5°C.
- It covers all major building sectors for new-build and refurbishments.
- It takes a top-down and bottom-up approach to setting limits. This means that the limits and targets in the Standard are set to meet national carbon and energy budgets (top-down) but are balanced with real, measured data on what is achievable (bottom-up).
- It is an in-use Standard so buildings can only claim to be Net Zero Carbon aligned once they have been occupied and used for at least one year with measured in-use building performance data. Continued conformity with the Standard is valid for twelve months leading up to the Reporting Period End Point (RPEP). Buildings must thereafter undergo annual re-verification to maintain their claim to be aligned with the UK NZCBS.

The version released in September 2024 is a Pilot based on in-depth research across multiple building types. The diagram below shows the timetable for the Pilot and the next steps leading to the launch of Version 1.



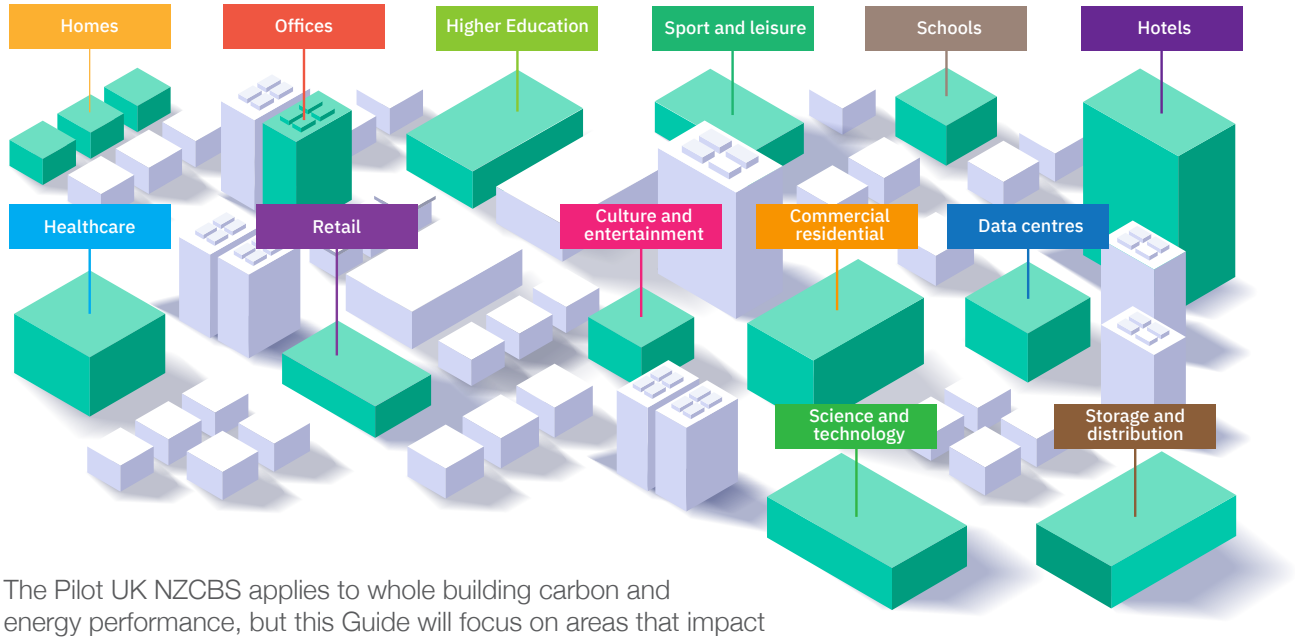
Source: UK Net Zero Carbon Building Standard Pilot Version Overview Document

Overview and purpose of the UK Net Zero Carbon Buildings Standard

The intention is to make the Standard practical and usable. While being aspirational, it is also based on input from professionals across the construction industry. The intended users reflect this collaborative approach: construction clients, designers, contractors, building performance managers, energy assessors and verifiers.

The team behind the UK NZCBS has emphasised that they do not intend this to become a British Standard. Instead, it will be an open assessment and verification tool. This will maximise its impact on the built environment.

The UK NZCBS Pilot is also widely applicable across many types of building, whether new-build or existing:



The Pilot UK NZCBS applies to whole building carbon and energy performance, but this Guide will focus on areas that impact the specification, design, installation and operation of HVAC systems.

A Standard built through cooperation

The UK Net Zero Carbon Buildings Standard is a truly collaborative piece of work. The organisations involved in its development reflect the entire construction supply chain:

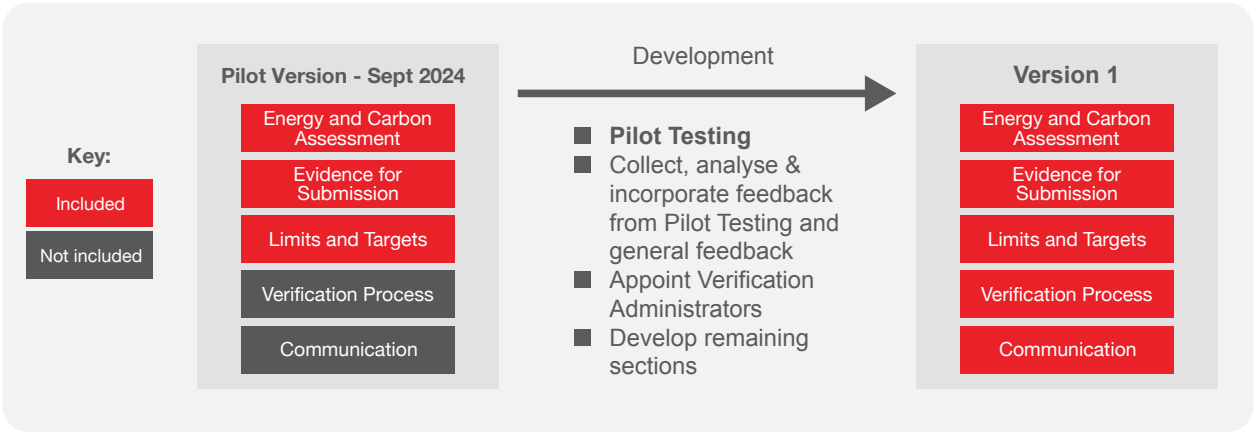
- Better Buildings Partnership (BBP)
- BRE
- Carbon Trust
- Chartered Institution of Building Services Engineers (CIBSE)
- The Institution of Structural Engineers
- LETI (Low Energy Transformation Initiative)
- Royal Institute of British Architects (RIBA)
- Royal Institution of Chartered Surveyors (RICS)
- UK Green Building Council (UK GBC)
- Property Industry Alliance (PIA)
- Institution of Civil Engineers (ICE)

Along with these bodies, other organisations have contributed their support, including **Mitsubishi Electric** which is a Gold Level Sponsor of the Standard.

Using the Standard Pilot version

Although it has been launched as a Pilot version, the UK NZCBS is ready for use. It provides the technical specification for achieving a Net Zero building, which can be adopted now onto projects and project briefs. The team behind its development is keen to start gathering feedback on the Pilot to move forward to develop and launch Version 1 later in 2025.

The diagram below illustrates what is included in the Pilot, and what has yet to be added. It also highlights the importance of industry feedback to the project. The Pilot Testing programme will begin in early 2025 where projects will be selected for testing (see our References section for a link to the website).



Source: UK Net Zero Carbon Building Standard Pilot Version Overview Document

Projects and assets which use the Pilot version will be considered ready for verification once this is available.

When putting the Standard into action, it is important to note its use of language. It contains four types of content: **Requirement, Recommendation, Permission and Informative Content.**

The table below shows the significance of each of these categories.

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' or 'may' are not used; or content prefixed with 'Note;' or for whole sections of Informative Content, the heading will state 'For Information.'

Using the Standard Pilot version

The Standard's requirements fall into three categories: **Limits, Targets and Reporting Requirements.** The table below shows an overview of pass/fail requirements and the reporting requirements for each.

Limit / Target	Pass / Fail Metrics	Reporting Requirements
Embodied carbon	Upfront carbon limits	■ Life cycle embodied carbon ■ Upfront carbon with generic material specifications (i.e. the standard permits use of TM65 in the absence of Environmental Product Declarations (EPDs)
Operational energy	Energy Use Intensity (EUI) limits	■ Annual operational carbon emissions intensity
On-site renewable electricity generation target	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 that no fossil fuel is used 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 for heat/cooling supplied	■ Energy used by the district energy scheme ■ Carbon emissions associated with heat/cooling 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	
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
OPTIONAL: Carbon offsetting		

The Standard provides targets and limits for each of these requirements, across the different building types it covers. An important point to note is that the targets are not static but are intended to be raised or lowered (in the case of limits) each year.

For example, Annex A (Table OE-1) sets out the lifetime Energy Use Intensity limit for a new generic office building. For a building constructed in 2025, the EUI limit is 85 kWh/m^{2}GIA/yr (kilowatt hours per m^2 of gross internal area per year). By 2028, the EUI limit for a new-build office reduces to 77 kWh/m^{2}GIA/yr and reaches 67 kWh/m^{2}GIA/yr for office buildings constructed in 2032.

The Standard requires that the pass/fail metrics for a project should be applied in the year construction commences. So, if design starts in 2030, but works commence in 2031 then the limits and targets for 2031 are applicable. Designers are therefore recommended to work to the limits required for the year that construction is expected to commence, and to include contingencies where this is not known.

One of the most important aspects of the Standard is that a key metric for energy use is metered data. This is to ensure that calculations for operational carbon emissions are accurate and based on actual building performance.

Implications for HVAC system design, installation and operation

It is clear from the list of limits and targets that HVAC systems will play a key role in achieving a Net Zero Carbon building. The Standard therefore impacts their specification, design, installation and operation in significant ways.

The Pilot version of the Standard does not currently provide all figures for targets and limits. For example, heating and cooling limits for most building types are not yet provided. The intention is to add these as more data is logged.

The list below highlights the main areas of the Standard that impact decisions around the design, specification and installation of HVAC systems, either directly or indirectly.

Operational energy and embodied carbon

As noted above, the Standard sets operational energy limits, measured as Energy Use Intensity (or Power Usage Effectiveness for data centres). This metric will be reported as annual EUI and then converted into an annual operational carbon emissions intensity per m^2 of GIA.

An important point here is that the pass/fail metric remains EUI. The conversion to operational carbon emissions is a secondary step, and one that will be impacted by changing conversion factors (for example as the UK electricity grid uses more renewable generation). On the Standard Pro Forma which is downloadable from the UK NZCBS website, assessors are asked to provide the carbon conversion they are using.

The limits will impact decisions on HVAC systems, with a focus on optimising energy use over the long-term. Considerations not only include the efficiency of HVAC equipment but also the application of techniques such as heat recovery in systems to reduce energy use overall.

Set against these decisions is the issue of embodied carbon in HVAC systems. The Pilot Standard focuses on ‘up front’ carbon. This is the measure of greenhouse gas emissions associated with construction products and processes up to the point of practical completion. However, the Pilot also requires the calculation of life cycle embodied carbon (LCEC). This measure will be added to future versions of the Standard as more information is gathered from test projects.

There is a note in the Standard covering the calculation of embodied carbon for MEP (mechanical, electrical, plumbing) equipment. The hierarchy of data sources on embodied carbon starts with the Environmental Product Declaration (EPD). Since these are not yet available for all products, the Standard points to CIBSE TM65 as the methodology for calculating embodied carbon.

For items costing more than 1% of the cost of building, TM65 Mid-Level Calculations should be used. For items costing less than 1% of the cost of the building, TM65 Basic Calculation can be applied.

For HVAC systems designers, balancing the embodied carbon of systems against their operational energy use will be a key factor in making decisions. The critical question will be whether a system with a higher up-front carbon footprint offsets this by being more energy efficient. This highlights the importance of considering the trade-off between embodied carbon and operational energy when making decisions on HVAC system design.

No fossil fuels

The Standard's 'No fossil fuels' rule highlights that electric solutions for heating and hot water are an absolute requirement for buildings aiming to achieve the Standard. We can therefore expect to see the increasing electrification of new and existing buildings, as well as the replacement of existing fossil fuel heating and hot water systems with low-carbon alternatives such as heat pumps.

Refrigerant GWP limits

Limits on refrigerants are also included in the Standard which requires the assessment of all fixed air conditioning, heat pumps and other fixed refrigeration systems (e.g. cold storage). It excludes refrigeration equipment used in industrial processes.

The Pilot Standard highlights that the scope of refrigerant 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."

The Standard sets a Global Warming Potential (GWP) limit for all in-scope refrigerant systems at 677 $kgCO_2e/kg$. This limit corresponds to the current GWP for R32 under UK Greenhouse Gas reporting (figures can be found in the UK Greenhouse Gas reporting documentation[2]). Furthermore, that GWP limit of 677 $kgCO_2e/kg$ will change if the GWP for R32 alters in future.

Exceptions to this requirement are systems installed before the release of the Standard, and where no works are conducted on the refrigeration system since the release of the Standard. This exclusion applies where the Reporting Period End Point (RPEP) occurs prior to the 1st January 2030.

It is important for specifiers and installers to note the source of GWP figures in the Standard to avoid confusion.

Most HVAC manufacturers report the GWP of their refrigerants as defined under the F Gas Regulations, not the UK Greenhouse Gas Reporting methodology. It will therefore be important to check that you are looking at the correct figure when designing and installing refrigerant-using systems.

Implications for HVAC system design, installation and operation

Refrigerant leakage reporting and measurement

In addition to GWP limits, the Standard also requires that refrigerant leaks are both reported and measured. This goes beyond the F Gas rules for annual leak checks which do not require the recording of leaks.

Working to the UK NZCBS means that refrigerant loss must be measured either by removing all refrigerant from a system and measuring it against the original amount, or that systems are topped up and the additional refrigerant amount is noted and recorded.

Connection to district heating and cooling networks

Where buildings connect to district heating or cooling networks, they must be assessed for operational energy use, carbon emissions and the carbon content of the heating and/or cooling provided by the network. This applies to new and existing buildings and the assessment includes the network itself.

The Standard requires heat meters at the connection to the building. It sets out a carbon calculation method to attribute emissions to heat drawn from the network.

However, the Standard establishes that heat or cooling rejected by other users ("from industrial processes or cooling and refrigeration") shall be attributed zero emissions. Emissions associated with the energy used for the distribution and extraction of energy from recovered heating or cooling will be measured.

This seems to point to ambient heat loops or low-temperature heat networks providing a potential low-carbon heat solution for the future.

To meet the requirements of the Standard, new district heating and cooling networks are not permitted to use fossil fuels. However, many existing district heating and cooling networks still rely on fossil fuels as their energy source.

Buildings connecting to these would not meet the Standard's requirement to be 'fossil fuel free'. It is particularly problematic in locations where new buildings are required by local planning rules to connected to these networks.

To address this issue, the Pilot Standard includes a note that connection is permitted if the network has a clear and very detailed plan to transition away from fossil fuels by 2040.

Controls and monitoring

While the Pilot Standard makes no direct reference to a requirement for building controls, there is no doubt that its focus on monitoring actual energy use makes them a critical technology.

For HVAC systems, controls not only allow building managers to understand how and where energy is being used in the system, but also to optimise the application of heating and cooling in the building.

As the Standard requires annual assessments to ensure a building is meeting its EUI targets, managing the use of HVAC systems will support more energy efficient long-term building operation.

Retrofitting to the UK Net Zero Carbon Buildings Standard

The UK NZCBS is applicable to both new-build and retrofit/refurbishment projects. The standard distinguishes between these project types and provides specific requirements for each. HVAC system choice for new buildings and retrofit projects will be impacted by the UK NZCBS from the point of view of both embodied and operational carbon calculations.

The UK NZCBS classifies projects into different "building types" and "works types":

Building Types:

These typically determine the operational assessment requirements and limits, distinguishing between New Buildings (where a significant portion of the floor area is new) and Existing Buildings (all other buildings).

Works Types:

These define the embodied carbon assessment requirements and limits, categorising projects as New Works, Retrofit Works, Reportable Works, or Non-Reportable Works, based on the scale and nature of construction activities.

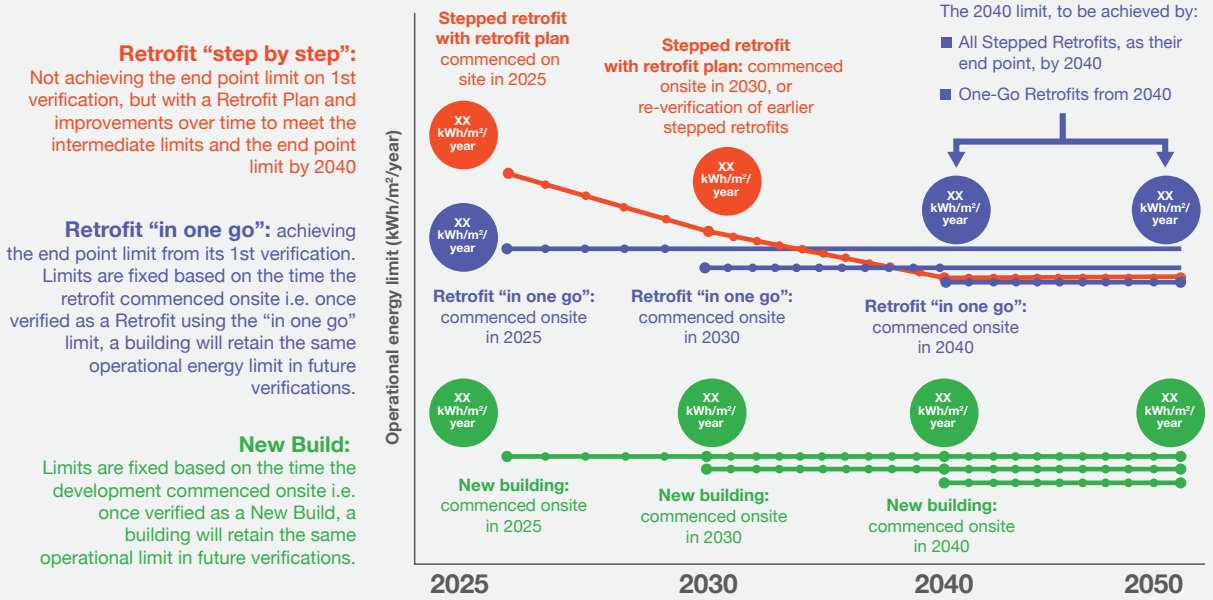
The Standard acknowledges that a building's type can change over time, for example, a new building can have retrofit works applied to it later. This flexibility allows the UK NZCBS to accommodate a wide range of project scenarios, including both new construction and various scales of refurbishment.

There are some specific requirements for retrofit projects:

Embodied carbon limits: Separate upfront carbon limits are provided for New Works and Retrofit Works. This differentiation recognises the unique challenges and opportunities for reducing embodied carbon in refurbishment projects.

Operational energy limits: Existing buildings undergoing retrofit must either meet a "One-Go Retrofit" energy use intensity limit or a less stringent "Stepped Retrofit" limit along with a retrofit plan outlining a pathway to meet stricter limits by 2040.

The diagram below illustrates how operational energy limits are treated for One-Go and Stepped retrofit projects. The green line shows the limits for new-build projects. The aim is for Stepped retrofit approaches to set 2040 as an end goal for achieving the required operational energy limit for their building type.



Source: UK Net Zero Carbon Building Standard Pilot; Annex A page 93

Retrofitting to the UK Net Zero Carbon Buildings Standard

The requirement for a retrofit plan in certain cases demonstrates the UK NZCBS's focus on a phased approach to improving the energy performance of existing buildings. This plan must outline retrofit steps, demonstrate compliance with future energy limits, and include an assessment of the embodied carbon associated with those future works.

On-site renewable electricity generation targets for retrofit projects take into account the constraints of retrofit by allowing reduced renewable energy generation targets for existing buildings based on factors like access, structural capacity, and the presence of existing equipment.

The UK NZCBS is designed to be applied to both new-build and retrofit/refurbishment projects. By categorising projects into different building and works types and establishing specific requirements for each, the standard provides a comprehensive framework for assessing and reducing carbon emissions across the entire building lifecycle, encouraging a holistic approach to Net Zero carbon in the built environment.

The diagram below shows the Standard's approach to limit setting for new-build and retrofits:

	Operational Energy	Upfront Carbon
New build	■ To incentivise low-energy buildings ■ Limits to be achievable but ambitious LIMITS = Best Practice at time of construction.	■ To incentivise low upfront carbon ■ Limits to be achievable but ambitious LIMITS: Best practice at time of construction.
Existing buildings / retrofit	■ To incentivise low energy buildings ■ Limits to be achievable by most buildings once retrofitted to encourage mass rollout LIMITS = Ultimately, by 2040 buildings must meet the equivalent of a Medium Retrofit. As an option, this can be met in steps with less onerous early steps if buildings have a Retrofit Plan.	■ To prohibit the highest upfront carbon retrofits ■ To encourage retrofit LIMITS = Typical Practice (i.e. Best Practice but assuming a lot of works) at the time of the works.

Client engagement and best practice

Client engagement with the UK Net Zero Carbon Buildings Standard is a critical element of success. If clients want to aim for UK NZCBS verification, then this needs to be made clear at the design stage of any new-build or retrofit project.

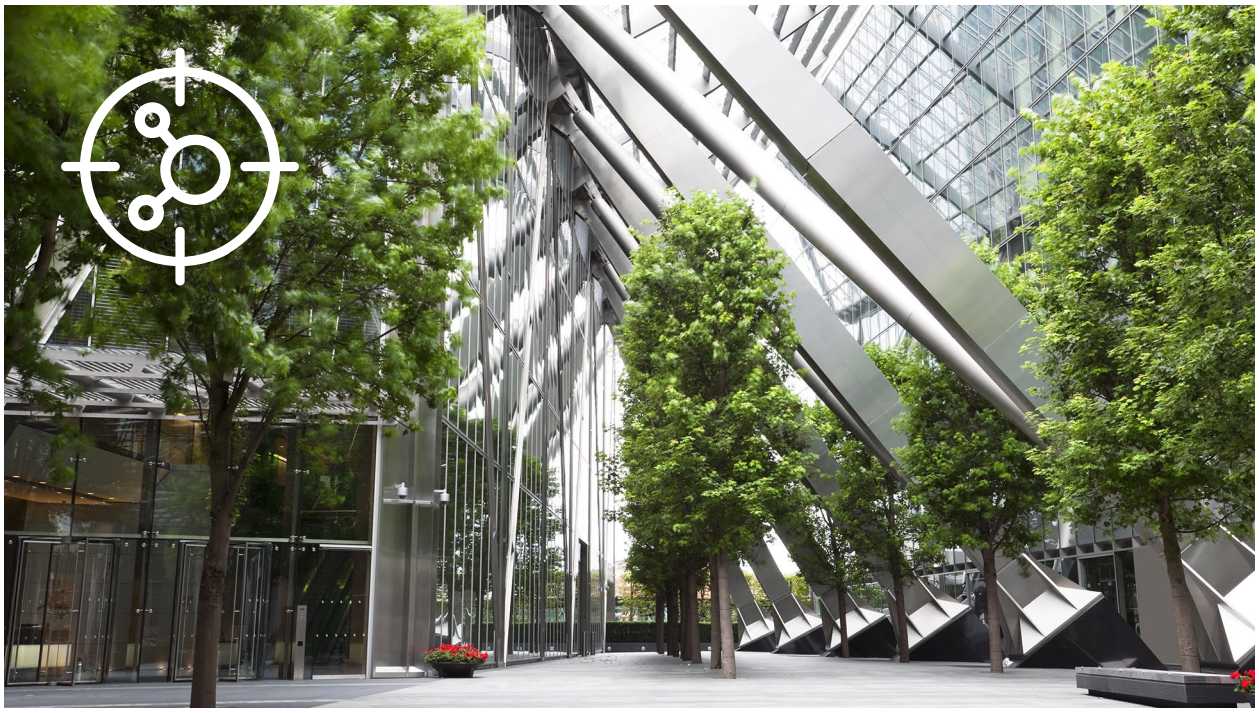
Early specification allows design teams to incorporate the Standard's requirements from the initial design stages. This proactive approach can prevent costly retrofits or redesigns later in the project lifecycle. In addition, prompt engagement with the Standard enables informed decisions regarding the selection of low-carbon materials and systems, contributing to a lower embodied carbon footprint.

There are also benefits for clients targeting Net Zero. Specifying UK NZCBS compliance is more likely to attract design and construction teams experienced in delivering low-carbon buildings. This alignment of goals and expertise can lead to a smoother and more successful implementation of the Standard.

Achieving a Net Zero building or retrofit can be challenging. While not mandatory, the Standard offers advice on appointing experts who can offer guidance across the project.

For example, a Net Zero Carbon Coordinator would ideally be appointed early on and tasked with advising the client and design team on UK NZCBS compliance. They would also coordinate the collection and submission of data for verification. The use of qualified professionals to carry out Whole Life Carbon assessments is also recommended by the Standard.

Overall, the Standard focuses on the long-term performance of a building, so clients should be prepared to commit to this approach from the outset and well into the future.



Next steps - beyond the Pilot

The UK Net Zero Carbon Buildings Standard (UK NZCBS) is a new Standard in Pilot form. The aim of the Pilot is to encourage industry participation and feedback. This is not only to collect data to set limits and targets for different building types, but also to raise any issues with methodologies used in the Pilot.

There are already some updates on the horizon. The Pilot highlights some important areas where the industry can expect future developments:

- **Inclusion of life cycle embodied carbon limits:** The Pilot focuses on upfront carbon emissions. There are plans to incorporate limits for life cycle embodied carbon emissions. This means that eventually the Standard will address the carbon footprint of materials from cradle to grave.
- **Expansion of space heating and cooling limits:** The Pilot version includes these limits for certain sectors and building types. The Standard aims to expand this to encompass more sectors and building types in the future.
- **Addition of electricity demand management limits:** Currently, the pilot version doesn't have limits for electricity demand management. Future iterations aim to introduce these, likely addressing peak demand reduction and load shifting.
- **Refinement of energy performance metrics:** The Pilot acknowledges the need to enhance energy performance metrics to reflect energy use intensity more comprehensively. This includes considering areas currently classified as Additional Use Areas.
- **Incorporation of delineation options:** Future versions intend to incorporate options for delineating responsibilities within buildings, such as separate assessments for base build and tenanted spaces.

An important future development is that the UK NZCBS will engage closely with existing building certification schemes. This will help to ensure that building developers and owners are not faced with the task of undergoing more assessment than necessary.

For example, the Standard development team is already engaged the NABERS scheme. The goal is to agree a NABERS rating which will indicate the building meets the UK NZCBS requirements on metered data and operational energy targets.

The Future of UK Net Zero Carbon Buildings

The UK Net Zero Carbon Buildings Standard (UK NZCBS) is likely to have significant impacts on the UK built environment, driving a transition towards more sustainable and low-carbon buildings.

The primary objective of the UK NZCBS is to provide a unified definition of "Net Zero Carbon Aligned Buildings" and encourage their development. This will see a surge in the construction of new buildings designed and built to meet the Standard's requirements.

The Standard's applicability to retrofit and refurbishment projects will encourage the improvement of existing buildings to align with Net Zero carbon principles.

The UK NZCBS provides pathways for existing buildings to achieve Net Zero carbon, either through a "One-Go Retrofit" or a phased "Stepped Retrofit" approach. This is expected to encourage building owners to invest in retrofitting measures to improve the energy and carbon performance of their assets, contributing to a significant reduction in the carbon footprint of the existing building stock.

The Standard mandates a Whole Life Carbon Assessment (WLCA) for projects, emphasising the importance of considering carbon emissions throughout a building's entire lifecycle. This is expected to promote a more integrated approach to building design, considering both upfront embodied carbon (from material production and construction) and operational carbon (from energy use during a building's operation).

The Standard's focus on reducing operational energy and phasing out fossil fuels will drive the adoption of energy-efficient HVAC systems. This includes a shift towards all-electric systems powered by renewable energy sources, such as heat pumps and solar panels. The Standard also promotes the use of low-GWP refrigerants in HVAC systems, further reducing the environmental impact.

The UK NZCBS represents a significant step towards decarbonising the UK built environment. By establishing clear standards, promoting best practices, and encouraging innovation, the Standard will drive substantial change in the way buildings are designed, constructed, and operated, contributing to the UK's Net Zero 2050 goal.

Further Reading

Mitsubishi Electric CPD Guide to Operational Carbon in New and Existing Buildings

https://library.mitsubishielectric.co.uk/pdf/book/Issue_83_-_Operational_Carbon_in_New_and_Existing_Buildings

Mitsubishi Electric CPD Guide Embodied Carbon

https://library.mitsubishielectric.co.uk/pdf/book/Embodied_Carbon_CPD_Guide

Mitsubishi Electric CPD Guide to Whole Life Carbon in the Built Environment

https://library.mitsubishielectric.co.uk/pdf/book/Issue_81_-_Whole_Life_Carbon_in_the_Built_Environment

Mitsubishi Electric CPD Guide to the UK Net Zero 2050 Roadmap and the Built Environment CPD

https://library.mitsubishielectric.co.uk/pdf/book/Issue_75_UK_Net_Zero_2050_Roadmap_and_the_Built_Environment

References

1. **Net Zero Carbon Building Standard (Pilot)**

   https://www.nzcbuildings.co.uk/pilotversion

2. **UK Greenhouse Gas Reporting: Conversation Factors 2024**

   https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2024

To receive a CPD seminar on 'The UK Net Zero Carbon Buildings Standard (UK NZCBS) - The Future of Low-Carbon HVAC Systems', you can call your Mitsubishi Electric Regional Sales Office to arrange an in-house presentation of this information.

If you would like to receive invitations to future CPD events, please email **livingenvironmentalsystems@meuk.mee.com**

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Note: The fuse rating is for guidance only and please refer to the relevant databook for detailed specification. It is the responsibility of a qualified electrician/electrical engineer to select the correct cable size and fuse rating based on current regulation and site specific conditions. Mitsubishi Electric's air conditioning equipment and heat pump systems contain a fluorinated greenhouse gas, R410A (GWP:2088), R290 (GWP:3), R32 (GWP:675), R407C (GWP:1774), R134a (GWP:1430), R513A (GWP:631), R454B (GWP:466), R454C (GWP:148), R1234ze (GWP:7) or R1234yf (GWP:4). *These GWP values are based on Regulation (EU) No 517/2014 from IPCC 4th edition. In case of Regulation (EU) No.626/2011 from IPCC 3rd edition, these are as follows. R410A (GWP:1975), R32 (GWP:550), R407C (GWP:1650) or R134a (GWP:1300).

Effective as of January 2025

Green Gateway greengateway.mitsubishielectric.co.uk