LEADING ROOFING EXCELLENCE

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NFRC Position Paper – UK Net Zero Carbon Buildings Standard

Implications for the UK roofing supply chain

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Introduction

The UK Net Zero Carbon Buildings Standard (UKNZCBS) fundamentally changes how building performance is defined, measured, and verified across the UK built environment. It establishes a consistent, evidence-based framework for determining whether a building is genuinely 'net zero carbon aligned', moving the industry away from aspirational or design-based claims towards demonstrable, in-use performance. Although voluntary, the standard will increasingly become a prerequisite for public projects and is likely to be referenced by architects and specifiers across the industry.

The standard marks an important shift for the roofing sector by recognising roof systems as critical to a building's carbon performance, influencing both upfront embodied carbon and operational energy use. NFRC supports the principles behind the standard, but emphasises that roof system designers and contractors must be involved from the outset to ensure successful delivery.

A Shift from Compliance to Performance

Roofing design has historically been driven by prescriptive requirements, such as achieving target U-values or meeting product certification standards, but the UKNZCBS adjusts this approach. A building's compliance is determined through measured outcomes, including at least 12 months of independently verified operational performance data. A roofing system's thermal performance, airtightness, durability, and integration with other building systems must all be successfully delivered for the building to achieve compliance. What is built, and how it performs in use, is what ultimately matters.

Environmental Product Declarations (EPDs)

The standard will significantly increase the use of verified EPDs. The UKNZCBS aligns closely with the Royal Institution of Chartered Surveyors (RICS) Whole Life Carbon Assessment methodology, which prioritises verified EPDs when calculating embodied carbon. Where product-specific EPDs are unavailable, assessors must use generic default data. Generic values are typically conservative and can produce higher embodied carbon figures, making it harder for projects to meet the standard.

For roofing, this means that without EPDs, the carbon benefits of different insulation types, waterproofing systems, and associated components may not be accurately reflected in assessments. Expanding the availability of verified EPDs across roofing product categories will likely become more important.

Embodied Carbon and Roof Build-Ups

The standard introduces mandatory limits on upfront carbon emissions, making careful specification more important than ever. Flat roof assemblies can contribute significantly to embodied carbon, particularly where multiple layers, high-specification materials, or complex build-ups are involved. Previously accepted specifications should therefore be reviewed critically with the new standard in mind.

Over-specification, whether through unnecessary layers, excessive material use, or overly conservative design assumptions, now carries a measurable carbon penalty. To be very clear, this does not mean anyone should be compromising performance or durability. Rather, a more considered approach is required, in which each component of the roof build-up is justified in terms of its contribution to performance, longevity, and carbon impact. This may involve exploring alternative materials, rationalising layer configurations, and ensuring systems are specified appropriately for their intended use, rather than defaulting to 'belt and braces' solutions.

Insulation: Optimising, Not Maximising

The relationship between insulation and carbon performance is more nuanced under the UKNZCBS than traditional compliance regimes. Increasing insulation thickness reduces operational energy demand and supports energy use intensity targets, but it also increases embodied carbon, particularly for materials with higher manufacturing impacts.

Design teams must therefore consider whole-life performance, balancing operational and embodied carbon rather than focusing on a single metric. The optimal solution is not necessarily the greatest insulation thickness, but the point at which overall lifecycle carbon emissions are minimised.
It is also worth noting that roof performance operates within a wider context: gains achievable at roof level are ultimately constrained by the performance of walls, windows, and other elements. For roofing specifically, thicker insulation build-ups can affect detailing at upstands, parapets, rooflights, and thresholds, and may introduce challenges around fire performance and moisture risk. Early engagement in the design process is essential to address buildability, detailing, and performance holistically.

Waterproofing Systems and Durability

The standard's whole-life carbon approach places greater emphasis on durability and service life. Whilst Version 1 focuses primarily on upfront carbon, future iterations are expected to introduce more explicit whole-life carbon limits. Systems that require frequent replacement or significant intervention over a building's life carry a higher carbon burden, and the standard is clear on this matter.

For waterproofing systems, this reinforces the importance of selecting solutions with proven durability and an appropriate design life for the project. It also underscores the critical role of installation quality. A system that fails prematurely due to poor workmanship not only creates cost and disruption but also generates additional embodied carbon through repair or replacement.

In this context, quality assurance, competent installation, and adherence to industry and manufacturer guidance are now directly linked to carbon performance. Getting it right first time is essential, as rework and defects carry both environmental and commercial consequences. This makes recognised markers of contractor quality, such as NFRC and NFRC CPS accreditation, all the more significant.

Roofs as Multi-Functional Assets

The UKNZCBS requires buildings to incorporate on-site renewable energy generation where feasible, typically through photovoltaic systems. This elevates the roof from a passive element to an active energy-generating platform.

Roofs are increasingly required to serve multiple functions simultaneously, including waterproofing, insulation, drainage, plant support, and energy generation. This introduces additional complexity around structural loading, waterproofing interfaces, fire performance, and maintenance access. Effective coordination between disciplines is essential, and roofing contractors are essential contributors to early discussions. An early collaborative approach helps to identify and resolve conflicts before construction begins. Ensuring PV systems are integrated without compromising the integrity or longevity of the waterproofing system is a key consideration, especially under the Future Homes Standard. As more elements are introduced to the roof space, collaboration and coordination have never been more important.

Increased Rooftop Plant and Services

The transition away from fossil fuel-based heating will drive greater use of electrically powered plant, such as air source heat pumps, much of which will be located at roof level. This will result in increased plant density, additional penetrations, and more complex service interfaces.

On roofs, this places greater emphasis on robust detailing, load assessment, and maintenance planning. The interface between plant supports, waterproofing systems, and insulation must be carefully managed to avoid compromising performance. Access for inspection and maintenance must be considered at the design stage, as it has a direct bearing on both safety and long-term durability.

Drainage, Blue Roofs, and Climate Resilience

Although not yet fully codified within the standard, there is a clear direction of travel towards greater integration of climate resilience measures, including water management and attenuation. Blue roofs and other SuDS-aligned solutions are likely to become increasingly important, both in managing peak rainfall events and in supporting wider environmental objectives.

Designing and installing such systems requires a clear understanding of drainage behaviour, loading conditions, and system integration, further reinforcing the roof's role as a key contributor to overall building and site performance.

Verification, Evidence, and Accountability

A defining feature of the UKNZCBS is its requirement for independent verification based on measured performance data. Buildings cannot claim alignment with the standard until sufficient operational data has been collected and assessed.

This introduces a new level of accountability across the supply chain. Where buildings fall short of performance targets, scrutiny will likely focus on the building fabric and poor performance may be linked back to the contractor. Roofing contractors must be able to comfortably demonstrate that systems have been installed in accordance with design intent and manufacturer requirements. Maintaining clear records of materials, installation processes, and quality checks will become increasingly important. This aligns closely with the principles of the 'golden thread' under the Building Safety Act, reinforcing the need for transparency, traceability, and competence throughout the supply chain.

Conclusion

The UK Net Zero Carbon Buildings Standard represents a fundamental shift in how building performance is defined and delivered. For the roofing sector, it brings both increased responsibility and significant opportunity.

Roof systems are now recognised as critical to achieving net-zero carbon outcomes. Their design, specification, and installation influence not only a building's immediate performance but its long-term environmental impact. Roofs are performance-critical systems that must be designed, installed, and evidenced accordingly.

By engaging early in the design process, adopting a performance-led approach, and maintaining high standards of workmanship and documentation, roofing contractors can play a leading role in delivering the next generation of low-carbon buildings.

Actions the industry can take:

Architects and clients should engage roofing contractors and suppliers early in the design process to optimise roof build-ups, reduce embodied carbon, and coordinate integration with other rooftop elements like PV systems, plant, and drainage strategies. This avoids late design changes that can compromise performance and buildability.

Designers (including specialist engineers and system designers) should adopt a performance-led approach that considers whole-life carbon, durability, and buildability. They should actively seek input from roofing specialists when developing specifications. Prescriptive or standardised details developed without coordination across the design team may increase embodied carbon, create buildability challenges, or compromise long-term performance. Collaborative design between lead designers, specialist designers, and roofing system providers is essential to ensure roof systems support verified building performance.

Contractors should maintain high standards of workmanship to ensure roof systems perform as designed. Installation quality directly influences thermal performance, durability, and whole-life carbon outcomes. This should be supported by robust quality assurance, including inspection and testing where appropriate, and clear documentation of materials, installation, and any design interfaces. Demonstrating that installed systems align with design intent will be increasingly important in supporting verified building performance and reducing the risk of rework or premature replacement.