WHITEPAPER

Commercial Retrofitting and Net Zero

Exploring challenges and opportunities of innovation and regulation in commercial retrofitting

RetroNetZero
RS&IN

PlanetMark

The RS&IN implementation project

RetroNetZero RS&IN (Retro Net-Zero Buildings Regulatory Science and Innovation Network for unlocking adoption of innovation)

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For commercial property owners, retrofit is no longer a future ambition but an immediate strategic priority, driven by rising energy costs, regulatory pressure, investor scrutiny, and changing tenant expectations.

Executive summary and methodology

Around 80% of the buildings that will exist in 2050 already exist today, meaning that retrofitting our existing building stock is a critical component of the UK achieving its net zero targets, whilst improving resilience and protecting long-term asset value.

Operational energy use accounts for approximately 63% of the built environment's emissions, with commercial buildings responsible for about 23% of these operational emissions.

For commercial property owners, retrofit is no longer a future ambition but an immediate strategic priority, driven by rising energy costs, regulatory pressure, investor scrutiny, and changing tenant expectations. Despite this, commercial retrofit is still often delivered in a fragmented and reactive way, with innovations and regulation often seen as constraints rather than enablers.

This paper presents findings from a roundtable convened by Planet Mark and the RetroNetZero (RNZ) – Regulatory Science and Innovation Network, to explore business' views on innovation and regulation in relation to commercial retrofit. RNZ seeks to enable adoption of innovation to facilitate retrofitting in line with net zero ambitions, through provision of a regulatory science and data network. Until now the RNZ network has predominately focused on domestic retrofit, and the partners felt it was important to convene this roundtable and deliver a whitepaper to explore the opportunities and challenges specific to commercial property.

To explore these issues in depth, the RNZ Commercial Retrofit Roundtable was held over a three-hour, in-person meeting with 15 experts across commercial and domestic retrofit, including asset owners, consultants, contractors and policy specialists. The discussion captured practical experience of delivering retrofit, with a focus on identifying barriers, opportunities and transferable lessons between sectors.

This paper summarises the insights from that discussion. It is intended to inform industry stakeholders, policymakers, and investors, contributing to on-going work on commercial retrofit innovation regulation.

Key findings

Commercial retrofit is dominated by fragmented and reactive interventions, which dilute performance, increase costs, and limit long-term value.

Short-term political, commercial and investment targets continue to undermine strategic, portfolio-level retrofit planning.

Misaligned landlord-tenant incentives is a structural barrier, weakening the business case where costs and benefits fall to different stakeholders.

Effective retrofit tools already exist, but siloed delivery, inconsistent data and risk aversion slow adoption at scale.

Regulations that measure real, in-use performance drive better retrofit outcomes than those based on modelled metrics.

Circular economy approaches offer clear carbon and cost advantages but face big challenges of logistics, liability and contractual constraints rather than technical limits.

Closing education and skills gaps across installers, the supply chain and tenants is essential to improving performance, reducing risks and scaling retrofit delivery.

Strong cross-learning between commercial and domestic retrofit, particularly on holistic planning, incentive alignment and education, offer a clear opportunity to accelerate progress in both sectors.

1

Big picture: The need for a holistic and systemic approach

1.1

Systemic and structural barriers:

The most significant barrier identified by roundtable participants, and echoed across wider industry discussions, is the lack of a holistic approach to commercial retrofitting.

Retrofitting is typically delivered through isolated initiatives, single upgrades, or stand-alone projects, rather than through coordinated, whole-building or portfolio-level strategies that occur as part of existing renewal and refurbishment cycles. This fragmentation often leads to inefficiencies such as new technologies being introduced in a single property rather than across a portfolio, without consideration of how they interact with existing systems, future tenant needs or long-term asset plans. Participants noted that this can increase costs, frustrate tenants, and undermine performance outcomes.

In contrast, a holistic portfolio-wide approach would enable better sequencing of works, economies of scale and more reliable performance outcomes.

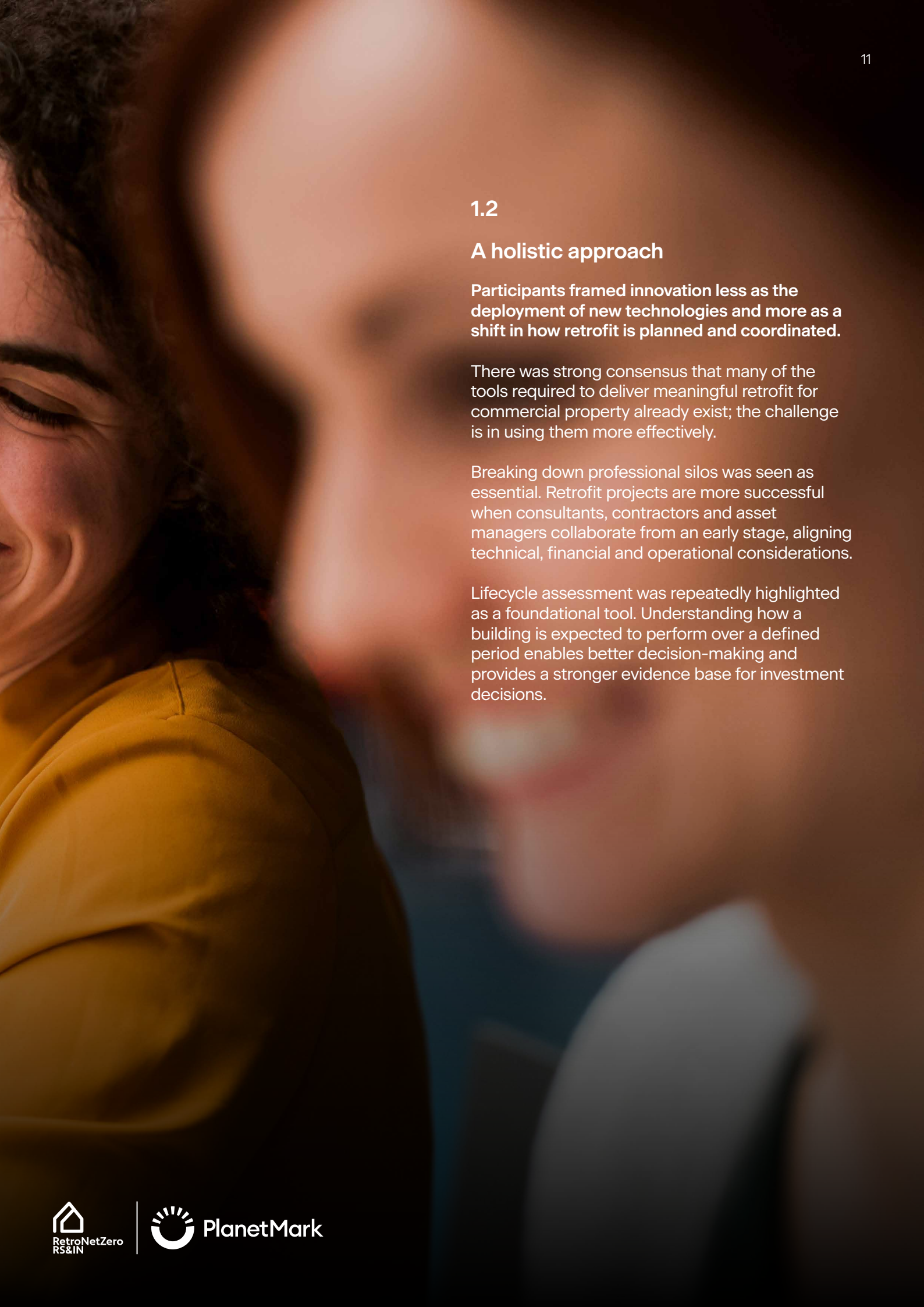
This challenge was closely linked to broader systemic barriers. Inconsistent short term political and commercial targets discourage portfolio-level planning, while existing funding and procurement models tend to reward strategies with short-term gains rather than long term resilience. As a result, retrofit is often treated as a series of tactical and reactive responses rather than as part of a long-term asset strategy.

Participants also connected this issue to the quality of new buildings. Several noted that due to inconsistent policy, standards and general industry practice, new buildings aren't being designed with whole-life performance and adaptability in mind. Consequently, new assets are likely to require retrofitting shortly after completion, reinforcing that cycle of reactive and fragmented action. As one participant noted - if developers still haven't solved building future-proofed or retrofit-ready new buildings, then how much improvement can we hope to make in retrofitting these properties?

Fiscal and policy frameworks were cited as barriers to holistic retrofit. Participants highlighted how tax and incentives have historically favoured demolition and new build over improvement of existing buildings, reinforcing market signals that discourage retrofit. An example is the demolition VAT exemption for new-build domestic properties, whereas retrofitting an existing building attracts 20% VAT. Similarly, short policy cycles, often limited to three or four years, reduce incentives to invest in retrofit strategies whose benefits accrue over time.

Risk aversion also creates a barrier. Even where technologies or systems have been successfully piloted, wider adoption is often slow, with solutions repeatedly tested on a building-by-building basis. This is exacerbated by fragmentation in the smart buildings market, where digital tools operate in silos and lack interoperability, limiting optimisation at a systems or portfolio level.

Retrofit projects are more successful when consultants, contractors and asset managers collaborate from an early stage, aligning technical, financial and operational considerations.



1.2

A holistic approach

Participants framed innovation less as the deployment of new technologies and more as a shift in how retrofit is planned and coordinated.

There was strong consensus that many of the tools required to deliver meaningful retrofit for commercial property already exist; the challenge is in using them more effectively.

Breaking down professional silos was seen as essential. Retrofit projects are more successful when consultants, contractors and asset managers collaborate from an early stage, aligning technical, financial and operational considerations.

Lifecycle assessment was repeatedly highlighted as a foundational tool. Understanding how a building is expected to perform over a defined period enables better decision-making and provides a stronger evidence base for investment decisions.

2

Barriers to progress in commercial retrofitting

Education and skills gaps were identified as a barrier to effective retrofit delivery.

2.1

Ownership, occupancy and incentives

A core theme throughout the discussions was the misalignment of incentives between landlords and tenants.

In particular, if there is a mismatch between the stakeholder who has control of higher-cost retrofitting like solar panel installation (typically the landlord) and the stakeholder who manages the energy bills and will therefore reap the rewards of lower cost energy (often the commercial tenant), then there is little incentive for the former party to make the investment as the benefits are all gained by the other party.

Participants emphasised that the high turnover of tenants, especially in retail, worsens the situation. Landlords operating on a value-added model often prioritise easy-fixes or quick refurbishment and reletting, which discourages investment in holistic retrofit with longer payback periods. Even in commercial buildings used for offices, where tenants stay for longer, patterns of occupancy can vary significantly reducing the incentive for long-term investment.

These dynamics led to calls for mechanisms such as green leasing to better align landlord and tenant incentives, which is a theme that also applies to domestic retrofit.

2.2

Education

Education and skills gaps were identified as a barrier to effective retrofit delivery.

Participants noted that installers and small businesses are not always trained, accredited, or supported to deliver retrofit measures to the required standard, particularly where projects are complex and require coordination across multiple systems.

This increases the risk of performance gaps between design intent and operational outcomes, potentially reinforcing scepticism about retrofit effectiveness and contributing to broad risk aversion across the supply chain.

3

Innovation in commercial retrofitting

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3.1

Digital tools

Digital tools, such as digital twins, were highlighted as valuable enablers of retrofit.

Digital twins add value by modelling energy efficiency, testing retrofit scenarios, layering climate risk, and prioritising solutions across portfolios. Such tools help asset owners align capital expenditure with expected revenue over time.

However, participants stressed that digital tools are only as effective as the data that is being input, emphasising the need for better data quality and education around data gathering.

3.2

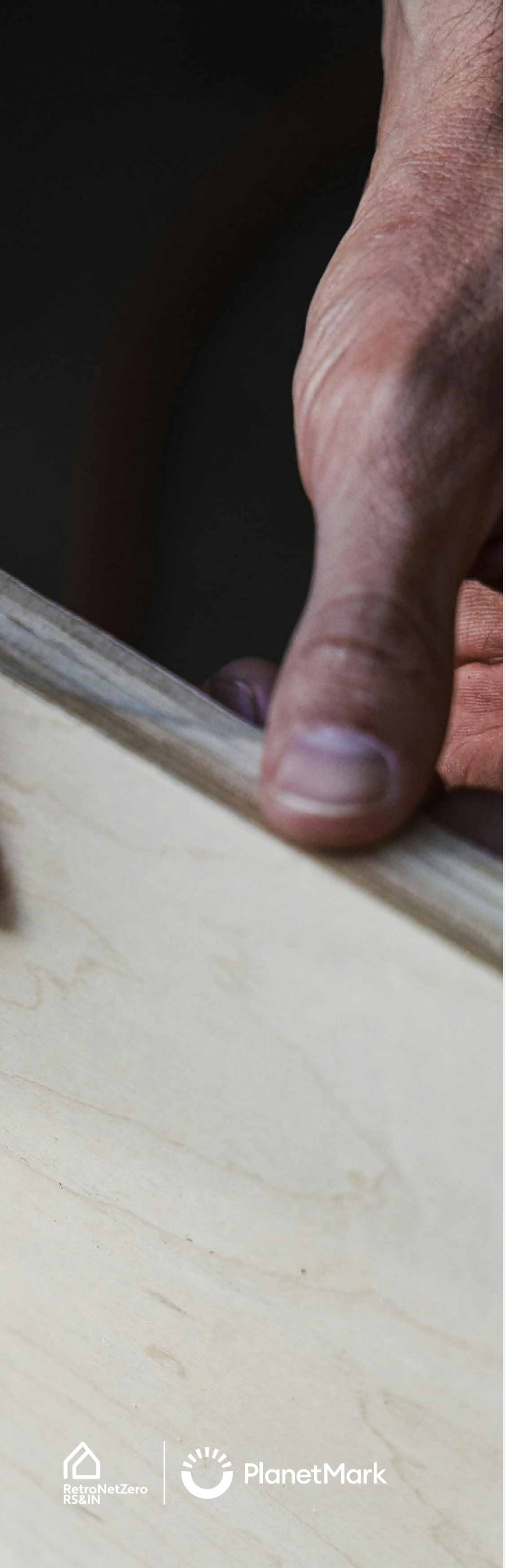
Commercial retrofit solutions registry

Participants proposed the creation of a retrofit solutions registry to build confidence and accelerate adoption of proven innovations.

Such a registry could track which technologies and innovations have been piloted, installed and tested, alongside evidence of in-use performance.

By documenting such experiences, the registry could reduce the need for repeated piloting, support knowledge-sharing across projects, and enable more informed decision-making. Over time, this could help de-risk investment, encourage wider uptake of effective solutions, and accelerate market transformation.

Examples of creative re-use projects such as Plymouth University's use of surplus plywood to support a mushroom growing project that will last for 10 years are proof of the potential for creative solutions and innovations to such barriers.



3.3

Circular economy and material re-use

Material re-use was discussed as both a carbon and cost reduction opportunity, but one that remains difficult to scale.

Participants mainly focused on the strip-out phase of retrofit, noting that materials are often discarded due to logistical and contractual barriers rather than technical limitations.

Tight timelines and a lack of incentives to recover, store or re-use materials mean that components are frequently treated as waste. The cost of storage was identified as the single largest barrier, alongside concerns around warranties, liability and improper removal or storage.

Nonetheless, initiatives such as the Material Index Exchange Marketplace and case studies from Finishes and Interiors Sector (FIS) are useful tools for those already engaging or wishing to engage in circular economy. Examples of creative re-use projects such as Plymouth University's use of surplus plywood to support a mushroom growing project that will last for 10 years are proof of the potential for creative solutions and innovations to such barriers.

4

Regulation and compliance

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4.1

Current regulatory drivers

Participants described a crowded and sometimes confusing regulatory landscape, shaped by overlapping standards, certifications and reporting requirements.

While regulation has played an important role in driving awareness of retrofit, participants noted persistent gaps between regulatory intent and actual performance.

Frameworks focused on operational, in-use performance were seen as more effective than those based on modelled outcomes. The National Australian Built Environment Rating System (NABERS) was highlighted as a leading example, providing clear, comparable results to owners, tenants and investors.

By contrast, Energy Performance Certificates (EPCs) were widely criticised for failing to reflect actual building performance, limiting their usefulness in driving retrofit decisions.

The UK Net Zero Carbon Building Standard (UK NZCBS) was viewed as a potential market-shaping standard. Although participants acknowledged the challenges of meeting its requirements under the current pilot, it was seen as driving higher quality data, clearer benchmarks, and greater consistency. However, careful integration with existing policy frameworks was emphasised to avoid confusion and duplication.

Participants also discussed the influence of other regulations and standards including the Building Safety Act and Awaab's Law, particularly in relation to legacy buildings and health and safety risks.

Other standards, regulations, certifications and private initiatives discussed included:

1	Energy Savings Opportunities Scheme
2	Streamlined Energy and Carbon Reporting
3	Minimum Energy Efficiency Standard
4	PAS 2030 – Installation of Energy Efficiency Measures in Existing Dwellings
5	PAS 2038 – Retrofitting non-domestic buildings for improved energy efficiency
6	BREEAM In Use
7	Fitwel
8	WELL Building Standard

Despite the breadth of regulation, participants expressed concern about the inconsistency and duplication, noting that conflicting guidance can complicate strategy, increase costs and undermine confidence.


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Maintaining the integrity of best-practice standards was identified as a key challenge.

4.2

Regulatory process and progress

Regulation was described as evolving slowly, with policymakers requiring repetitive and extensive evidence.

While this evidence-led approach is understandable, participants expressed concern that it delays action in a context where many retrofit solutions are already proven and under-used.

The “conveyor-belt” model (Hale, 2021), where industry standards progress from voluntary guidance to regulation, was broadly supported. Participants raised concerns about dilution of requirements as it moves through this process, particularly where lobbying or vested interests are involved. Maintaining the integrity of best-practice standards was identified as a key challenge.

4.3

Regulatory opportunities to accelerate retrofit

There was strong consensus that mandatory whole-life carbon assessments for all new buildings and major retrofits would significantly improve decision-making.

However, participants stressed that regulation alone is insufficient; planning officers and regulators must be trained to interpret performance data to avoid a tick-box approach.

More broadly, participants argued that regulation would be most effective where it provides long-term clarity, prioritises in-use performance, and aligns with financial and investment drivers. In this context, regulation was seen not just as a constraint, but as a potential enabler of more holistic, system-level retrofit approaches.

5

Cross-learning between commercial and domestic retrofit

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One of the goals of the roundtable was to understand more about the cross-learning opportunities between commercial and domestic retrofit in terms of innovation and regulation.

5.1

Adopting a holistic, whole-building approach

The most significant area of cross-learning identified was the need of a holistic approach.

In both sectors, retrofit is commonly delivered through isolated measures rather than coordinated, whole-building, portfolio-wide strategies. While scale and delivery mechanisms differ, participants agreed that integrated planning is essential.

5.2

Bridging the landlord-tenant incentive gap

Misaligned incentives between owners and occupants were identified as a shared challenge.

In the commercial sector, limited engagement from asset owners can leave tenants bearing operational costs and sub-optimal conditions. Similar tensions exist in domestic rental sector.

Participants emphasised the need for greater engagement from landlords and asset owners, driven by tenant expectations, regulatory pressure and investor scrutiny. At the same time, tenants have a role to play in maintaining retrofit measures and reporting on performance benefits.

Improved communication and data-sharing were seen as critical to demonstrating value in practice. By evidencing cost savings and comfort improvements, tenants can strengthen the case for further investment, while owners can use this data to support more strategic, long-term retrofit planning.

Ensuring that retrofit professionals understand buildings as integrated systems was seen as essential to avoiding performance gaps and unintended consequences.

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5.3

Addressing the education and skills gap

Education and skills gap were identified as a critical issue across both sectors.

Ensuring that retrofit professionals understand buildings as integrated systems was seen as essential to avoiding performance gaps and unintended consequences.

Participants also highlighted the importance of educated occupants. Retrofit results depend in part on how buildings are used and maintained, making occupant understanding and engagement critical to success.

Finally, continued education among investors and asset owners was seen as vital to building confidence in retrofit performance, reducing perceived risk, and supporting the scaling of retrofit across both commercial and domestic sectors.

RetroNetZero Partners

This report was developed by Planet Mark as part of the RetroNetZero RS&IN (Retrofit Net-Zero Buildings - Regulatory Science and Innovation Network for unlocking adoption of innovation) project, which is funded by Innovate UK: Regulatory Science & Innovation Networks (Project 10139469). The consortium, led by BRE, includes Planet Mark, the National Retrofit Hub, Construction Products Association, National Energy Foundation and Constructing Excellence.

BRE:

- BRE is a world leading, multi-disciplinary, building science centre with a mission to improve buildings and infrastructure, through cutting-edge research and knowledge generation.
- BRE maintains a range of products, services, standards and qualifications that are used around the world to bring about positive change in the built environment.

Constructing Excellence:

- Constructing Excellence is a place for leading organisations and individuals with a role in shaping and delivering a better built environment to come together, share knowledge, insight and approaches.
- The insight gained enables them to implement solutions that will improve the performance of their businesses, their projects and the built environment.

Construction Products Association:

- The Construction Products Association (CPA) is the overarching trade association for construction product manufacturers and suppliers
- CPA's membership network comprises both companies and 40 product sector trade associations – ceramics, timber, roofing, aggregates, windows, steel etc

National Energy Foundation

National Energy Foundation:

- The National Energy Foundation (NEF) is a registered charity established in1988, based in Milton Keynes
- Our focus is domestic retrofit and we have two core aims, Facilitating reduction of household emissions and Alleviation of fuel poverty through 'Affordable Warmth' initiatives

NATIONAL RETROFIT HUB

National Retrofit Hub:

- The National Retrofit Hub is nonprofit collaborative organisation that brings together all those involved in the retrofit sector to share their expertise and work together to enable the local delivery of retrofit at scale in line with a National Retrofit Strategy
- Our mission is for existing buildings to meet the health & wellbeing needs of all people and contribute to achieving the UK's energy security and Net Zero targets

PlanetMark

Planet Mark:

- Planet Mark is an internationally-recognised sustainability certification and net zero consultancy for organisations and the built environment. For over a decade, we have supported 700+ organisations to radically reduce carbon emissions, create operational efficiencies and work towards the global transition to net zero

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