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RISE Discoveries

Editorial: Deterioration of retrofit podcast

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Unpacking the deterioration of retrofit

Jonathan Newton of RISE recently spoke with Dr Martin Fletcher, Senior Research Fellow at the Leeds Sustainability Institute, about a pressing but underexplored challenge in energy efficiency: retrofit deterioration.

Beyond the upgrade: Why retrofitting needs re-examination

At Leeds Beckett University, the Leeds Sustainability Institute has spent three decades evaluating building performance. Their focus spans behaviour, building systems, and the surrounding environment. Dr. Fletcher, in particular, works with social housing providers to evaluate retrofit works—gathering pre- and post-installation data to fully understand how upgrades perform under real-world conditions.

What is retrofit deterioration?

Retrofit deterioration refers to the decline in performance of retrofit improvements over time. Factors such as shifting occupant behaviour, poor installation, unexpected weather conditions, or gradual material failure can all lead to reduced energy savings—undermining initial expectations.

Why it matters

The rationale behind retrofitting is twofold: reducing household energy bills and cutting carbon emissions. In the UK, domestic heating remains one of the largest sources of emissions. Effective retrofitting protects households from fuel poverty and helps meet the nation's net zero targets.

However, when retrofit performance deteriorates, both goals are compromised. Unfortunately, deterioration remains under-researched. Without reliable data, it's hard to assess how widespread the issue is or what kind of impact it has on national energy goals.

Digging into the data deficit

To tackle this knowledge gap, the Leeds Sustainability Institute is collaborating with the Department of Energy Security and Net Zero on the Deterioration of Retrofit Performance (DRIP) project. In its first phase, DRIP scoured existing academic studies and grey literature—including government and industry reports—to assess retrofit degradation in loft, solid wall, and cavity wall insulation.

Key findings? The UK data pool is shallow. Much of the available research is international, lacks consistency across materials and regions, and leans heavily on laboratory testing rather than long-term, in-situ studies.

> "The big picture finding is that there's a lot of information gaps out there," says Dr Fletcher.

Understanding severity and scale

Given these gaps, DRIP proposes two urgent avenues: improve the **severity** data by building a library of naturally aged materials, and expand our sense of **scale** by collecting data from professionals already witnessing deterioration during property visits.

Expert insights: How retrofits fail

In response to limited data, the team gathered expert consensus through a workshop and Delphi study. They identified three key deterioration modes:

- **Accidental damage**: External forces, such as residents disrupting insulation or wildlife interfering with materials.
- **Material degradation**: Even perfect installations can degrade—crumbling, blowing, or settling over time.
- **Design and installation quality**: This is the most avoidable and impactful cause. Poor specifications and rushed installations almost guarantee early deterioration. Solutions might include protective boarding in lofts to prevent damage from stored items.

Moisture plays a central role across all types. Managing how it moves through a building—via proper ventilation, sealants, and system-wide design—is essential to reducing the risk of failure.

What can be done

For property owners and housing managers, the first defence is quality: ensuring careful design, specification, and installation. Ongoing maintenance is also crucial. While social landlords often adopt proactive maintenance schedules, individual homeowners tend to fix problems only once visible—often too late.

For policymakers and researchers, the challenge lies in deepening our understanding of material lifespans and translating that insight into predictive models. These models would help ensure that energy savings are not just promised—but delivered.

Want to learn more?

The key report is published on the Government website:

- DESNZ (2025). *Deterioration of retrofit insulation performance (DRIP): Phase 1*

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- Rise podcast. *Deterioration of retrofit*