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THE
HOME-GROWN
HOMES
PROJECT

Timber in retrofit, repairs, maintenance and improvement

Report on opportunities for joinery elements, insulation and sawn wood products

woodknowledge WALES

Ariennir gan Lywodraeth Cymru
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CONTENTS

This report was written by Christiane Lellig of Woodknowledge Wales

CONTEXT

This task is part of work package 3 Markets & manufacturing which aims at developing markets and enabling supply of timber-based construction products, such as sawn timber, wood fibre insulation and timber windows. The focus of this task is on demand for timber products in retrofit, repairs, maintenance and improvement in Social Housing and what enables this. Supply aspects are considered with a focus on material resource, i.e. home-grown timber and reclaimed timber, and barriers as well as opportunities for Welsh manufacturers to embrace these.

APPROACH

We used a mix of desktop research, interviews and correspondence with experts as well as Communities of Practice conversations to engage with stakeholders around six main questions.

- What opportunities exist for timber products in building retrofit, repairs, maintenance and improvement markets?
- What future spending on these activities in social housing can be expected over the next 5-10 years?
- What types of timber products are used in retrofit, RM&I today and what further products could serve this market in the future? What specifically does this look like in social housing?
- What barriers exist to using these timber products in retrofit, RM&I in social housing?
- What opportunities exist for Welsh manufacturers to make products, for which there is opportunity in the retrofit, RM&I markets, from homegrown or reclaimed timber?
- What are the barriers to use of homegrown or reclaimed timber in products serving this market?

DEFINITIONS: RETROFIT, REPAIRS, MAINTENANCE & IMPROVEMENT

A distinction is to be made between retrofit activities and repairs, maintenance and improvement (RM&I). However, what constitutes retrofit versus repairs, maintenance and improvement is not clearly defined. A multitude of definitions can be found online and among housing and construction professionals. Which category works fall under – retrofit, repair & maintenance or improvement – defines which budgets these works are funded from and how these relate to the grant structure provided by government.

For the purpose of this report, we are using the following definitions.

Retrofit

Providing something with a component or feature retrospectively, i.e. something not fitted during construction. In building construction this can relate to installing new insulation, glazing, energy or heating systems.

Repairs

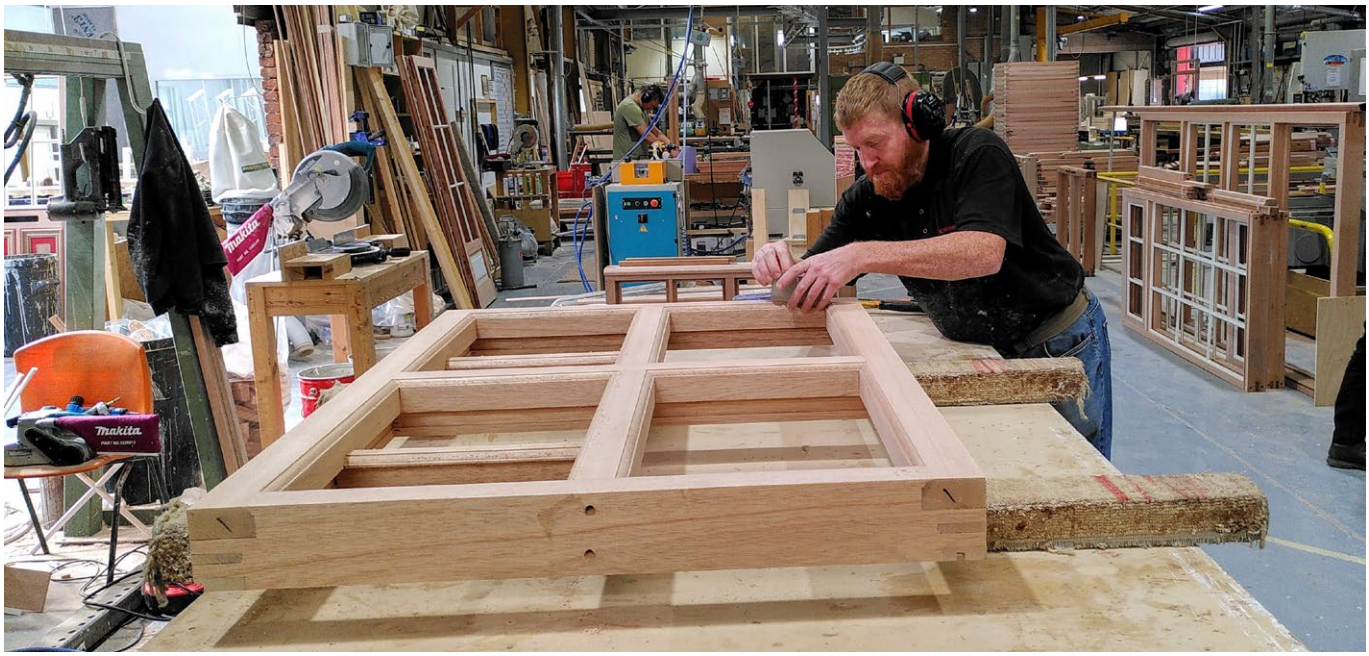
Day to day (or reactive) repairs relates to fixing breakdowns or replacing broken or damaged components usually needing to be fixed in a short-term period varying from emergency (dangerous or high risk) to urgent, to routine. Planned (or major component) repairs relates to replacing a major component such as heating systems or all the windows and external doors or kitchens to a home. This can also include compliance measures.

Maintenance

Often defined in conjunction with repairs. Maintenance can relate to servicing boilers or cleaning and repainting windows to ensure longevity and prevent requirement for repairs. It can also relate to day-to-day repairs.

Improvement

Improvement relates to replacement of an item or element at the end of its life with a higher quality alternative. What accounts as improvement is likely the most difficult to define as in practice it can involve extending a building, adding a patio or porch etc. It can also relate to the requirements of the Welsh Housing Quality Standard (WHQS).



OPPORTUNITIES FOR TIMBER IN RETROFIT, RM&I

Retrofit, RM&I markets in Wales and the UK

Building retrofit is a core challenge of our time (Building & Cities 2021). Across the world, the market for residential retrofit is growing. RICS cites estimates of this market growing by $65bn annually within the next 5 years (RICS 2024). The UK housing stock is among the oldest and worst insulated in Europe and therefore particularly acute with around 29 million homes in need of upgrading by 2050 (BEIS 2022, Greenregister). The UK's Climate Change Committee (CCC) estimates that an investment of about £250bn into housing retrofit will be needed to achieve the UK's net zero target (BEIS 2022).

According to some estimates, the typical UK home requires an investment of ca. £10,000. This estimate refers to costs for heating system and increasing energy efficiency levels. It remains unclear, whether costs for insulation as well as high-performance windows and doors are included in this figure (BEIS 2022).

Wales has one of the oldest, least efficient housing stocks in the UK – and most of the homes that will be standing in 2050 are already built. Scaling retrofit is essential for meeting emissions targets – and timber products can deliver faster, lighter, and lower-carbon solutions than conventional methods.

It is estimated that around 15% of construction timber products in the UK go into new housebuilding. The remaining 85% support other uses – including:

- Non-domestic new buildings
- Repair, maintenance, and improvement (RMI) of existing buildings
- Joinery repairs and replacement (windows, doors, stairs)
- Flooring and cladding
- Panel products used in furniture and interior fitouts
- Structural upgrades and over cladding in retrofit projects

Timber already plays a role in maintaining, upgrading, and decarbonising the buildings we have. Wales, and the rest of the UK, has a clear opportunity to lead in this space by scaling retrofit-focused timber solutions, leveraging existing production at Kronospan (processing over 1,000,000 m3/yr, with plans for additional production of OSB by 2027– a key component in timber frame), and the need for improvement of its ageing, poorly performing housing stock.

When it comes to procurement for these markets, it is often the contractor who decides where things are sourced, while architects typically issue a performance specification. Travis Perkins provides annual numbers for the RMI market via its RMI index (Travis Perkins) that gives an indication of trades people's perspective on the market and what is driving their decisions. It is estimated that up to 90% of structural timber is sold via builders merchants, which is the primary source for SME builders, whereas larger timber frame manufacturers buy their stock straight from the sawmill or the docks.

OPPORTUNITIES FOR TIMBER IN RETROFIT, RM&I

Retrofit, RM&I markets in Wales and the UK

The box below shows opportunities in retrofit for insulation developed as part of the SFiS funded feasibility study on woodfibre manufacturing in Wales 2025.

Opportunities in building retrofit - insulation

Cavity wall: Standard building method from 1930s. In 2022 over two thirds of these homes had been insulated. Of the remaining five million uninsulated homes not all are suitable for cavity wall insulation due to building methods in the 1930s. This market may be nearing saturation within the next decade.

Solid wall: Properties from the 1920s and earlier. In 2022 in around 91% of all homes with solid walls (7.7 million) these were still uninsulated. Costs for insulating these buildings are high and can be prohibitive to private households. There is a correlation between fuel poverty and households with uninsulated solid wall homes.

Loft: Rapid payback periods, ease of access and DIY potential make loft insulation a primary focus for homeowners. In addition to homes with uninsulated lofts from previous building periods, existing homes from the 1980s-2000s have considerable scope for topping up or replacing insulation systems.

Roof: Predominantly industrial and commercial buildings. Some roof insulation in homes is driven by loft conversions, or 'roof in roof' alterations. This has favoured rigid boards or rigid foam panels, meaning there is scope for wood fibre insulation.

Floor: Until the 1990s, many properties were built without insulating floors. An estimated eight million homes in the UK have suspended timber floors, the majority of which are uninsulated. Retrofit floor insulation is low but expected to increase once other insulation measures are completed.

RRMI market demand in social housing in Wales

Retrofit

The case for retrofit over newbuild in social housing is clear in most cases except for structurally unsound buildings. The social housing retrofit review lists costs, carbon and community benefits as main advantages over a newbuild approach (RIBA 2024). In Wales, the Optimised Retrofit Programme has stimulated innovative approaches to delivering low-carbon retrofit for social housing.

Repairs and maintenance

Research conducted by the University of Birmingham indicates that repairs and maintenance are the aspect that social housing providers get most complaints about. This is due to a lack of skilled workers as well as the financial capacity of social housing providers to respond to maintenance and repair requirements within expected quality standards and timelines (Bham 2024). This would indicate an opportunity for upskilling social housing clients which could link to skills needs in the timber manufacturing and installer sectors.

OPPORTUNITIES FOR TIMBER IN RETROFIT, RM&I

Retrofit, RM&I markets in Wales and the UK

Types of wood-based products

- Insulation: external (ETI) or internal (ITI) options. In social housing, mostly ETI is used. This typically requires an external frame, unless rigid material is being used, and could therefore be an interesting market for timber frame manufacturers. It could also provide an opportunity for rigid board manufacturers (e.g. production of rigid board woodfibre insulation). The ASBP sets out in its briefing paper "Finding the sweet spot" how natural insulation such as woodfibre can respond to the growing need for building retrofit (ASBP).

- Joinery: includes windows, doors, cladding, architraves, skirtings, kitchen furniture, bathroom furniture. Today, most windows and external doors are UPV. Kitchen and bathroom furniture as well as architraves and skirtings are typically MDF or chipboard based, internal doors are typically mass-produced hollow products. Except for larger manufacturers such as Kronospan, this market is less interesting for Wales based manufacturing businesses today regardless of the source of timber (home-grown or reclaimed).

- Roofs: In retrofit possibly roof replacement if required, otherwise usually limited to replacement of individual rafters or battens.

Planned investments in retrofit, RM&I activities

Based on business plans of 11 local authorities with housing stock we found that local authorities have made significant investments over the past 15 years to update existing properties to WHQS requirements. Completion of these wide-ranging programmes ranges from 2012-2021. All councils stress the significant funds required for further updating properties to reflect WHQS 2 (2023) by 2034.

In the future, local councils may have more accurate data on upcoming retrofit, maintenance and repairs works due to an investment into new software and data management systems for existing housing stock. Age and build era of existing housing stock seems to vary between local authorities with the bulk of existing housing from the three periods 1919-1944 (pre-WWII), 1945-1965 (post-war) and 1965-1980 (mixed classifications 1965-1974 or 1989). Thermal performance of housing stock varies between local authorities and hence does the pressure on upgrading properties to EPC C and above by 2030.

In addition, several councils invest significantly into buying properties on the open market, including buying back former council homes or municipal buildings. These will need to comply with WHQS and therefore undergo retrofit works to varying extent.

Planned investment in external and internal improvement ranges from £20,000k for the overall period for smaller local authorities to £50,000k p.a. for larger ones. This includes an average of £6,000k p.a. for general repairs & maintenance and WHQS related activities in the range of £14-25,000k p.a. to £30-50,000k p.a., depending on size of housing stock. There is no indication what part of the overall maintenance and repairs expenditure is reserved for staff or services cost and what for materials.

Whilst we know of individual councils planned investment in insulation, for example Cardiff Council and Swansea Council are using external thermal insulation, most business plans do not give information on this level of detail. This is also true for investment in joinery. Some local authorities have already commissioned windows, kitchen and bathroom retrofit for the coming years or have established supply partnerships with specific material suppliers (e.g. Caerphilly Council with Robert Price). Caerphilly Council has set up its own uPVC window factory to serve its needs and Wrexham Council has commissioned all windows and doors for future upgrades.

OPPORTUNITIES FOR TIMBER IN RETROFIT, RM&I

Retrofit, RM&I markets in Wales and the UK

Where reference is made to investment in flooring, it remains unclear what type of flooring this refers to and may mainly relate to carpet flooring and tiles.
It remains unclear what role home adaptations play in this context, e.g. for disability or adapting for the elderly.

Barriers to using timber products in retrofit

Recent developments in retrofit include the Retrofit Standards Framework. Its aim is to assure quality in retrofit. However, PAS 2030 and 2035 requirements for certification and warranties of products and installers present a barrier to using woodfibre insulation in government funded retrofit projects, such as social housing. Removing existing barriers will be crucial for unlocking this market potential. This will require coordinated action from policymakers, retrofit organisations (e.g. national retrofit hub), and industry.

Woodfibre insulation presents itself as a potential first choice for healthy, low-carbon retrofit, i.e. rigid panel as internal or external wall insulation and flexible rolls as loft insulation (for ease of access to confined spaces).

Barriers to retrofit with biobased materials is a main focus of the Transforming Homes Project (Transforming Homes). Cost is a main barrier for using woodfibre insulation due to the supply chain situation - woodfibre is currently imported from Europe as there is no manufacturing plant in the UK. The LCA of woodfibre insulation is very similar to mineral wool. Breathability when understood as vapour openness instead of moisture buffering capacity does not show significant differences between mineral wool and woodfibre insulation. This mainly relates to a very common misunderstanding of the term. Moisture buffering is a unique trait of biobased materials and helps regulate humidity levels in buildings, a capacity that mineral wool does not have.

Retrofit is recognised as being more vulnerable to bad design and installation when using bio-based materials as more attention to detailing is required – which is why the intention behind PAS 2030/2035 is laudable. From a specifier's perspective this means higher risk for more expensive materials. Today's lack of a trusted installer network is a barrier to adoption of woodfibre insulation and biobased insulation more widely.

Images courtesy of Steico

USE OF HOME-GROWN AND RECLAIMED TIMBER IN THE WELSH TIMBER SUPPLY CHAIN

Use of home-grown timber in the Welsh construction supply chain is limited and use of reclaimed timber could be labelled inexistent with the exception of panel based products and a future woodfibre insulation production line using post-industrial MDF. Relevant aspects of home-grown and reclaimed timber uses and use-potential have been explored across the Home-Grown Homes Project.

Illuminating the benefits of timber construction elements (3.3) investigated possibilities for manufacturing windows for social housing at industry scale, developing a woodfibre insulation plant and producing Glulam in Wales as leavers to make better use of homegrown timber in the future. These activities could also absorb reclaimed timber, if a viable business model for auditing, reclaiming, triage, preparation, storage, processing and certification can be developed (see also 3.6).

Wood and the circular economy (3.6) engaged stakeholders across the supply chain in the UK in a conversation around better use of reclaimed timber, including in manufacturing (see report). This demonstrated the absence of reclaimed timber in joinery as well as structural products in UK manufacturing today with the exception of the panel board industry, which is a major destination for reclaimed and home-grown timber. There is great interest in using reclaimed timber from specifiers, in particular architects and engineers, but much less resonance from manufacturers who are not yet struggling to access virgin timber at required volumes. Particular interest exists among designers to investigate the case for reuse of timber on site or sourced from within the perimeter of the community. Woodknowledge Wales' experience at Bontnewydd school also indicates that there may be greater potential in RM&I for use of reclaimed timber than in retrofit.

An enquiry with international timber window manufacturers supplying to the Welsh social housing market regarding their view and possible experimentation with reclaimed timber sparked zero response. A product search reveals no such option to be readily available or at least marketed. Slovenia based M-Sora, who manufacture windows for the European market, have made windows from reclaimed wood and confirm that the business case doesn't stack up unless the products are aiming for the premium market.

This perspective is also shared by 100 Détours, a French business mainly making public and office furniture from reclaimed windows as there is limited willingness to pay for the higher priced windows made from reclaimed windows.

Timber and Decarbonising Wales (5.1) demonstrated the limited uptake of domestic timber into construction supply chains. In addition, conversations with Welsh timber frame manufacturers in 2025 and 2026 have further confirmed the limited interest of this part of the industry to engage with the external retrofit market, regardless of their sources of raw material.

Enabling home-grown and reclaimed timber supply into TayC (2.5) homes in on the potential use of home-grown and reclaimed timber in Tai ar y Cyd homes including joinery products that would be of use in retrofit, repairs, maintenance and improvement. The findings demonstrate the potential of using home-grown and reclaimed timber in the future and the relevance of a coordinated network of small scale sawmillers able to process a variety of timber species to the right specifications. The main barriers remain consistent with overall findings across our work: there is a lack of alignment between procurement specifications and available products, a need for local supply chain development and coordination of the logistics required to enable material flow, and finally understanding of product performance, perceptions and increased cost.

A better understanding of the type and nature of businesses social housing providers call upon for the different segments – retrofit, repairs, maintenance and improvement – could clarify the role builders merchants could play in supplying products made from home-grown or reclaimed timber. These typically supply to social housing maintenance teams and smaller construction businesses, whereas larger businesses tend to source material via other distribution routes, e.g. direct from docks or sawmills.

UNLOCKING THE RETROFIT, RM&I MARKET FOR THE WELSH TIMBER SUPPLY CHAIN USING HOME-GROWN AND RECLAIMED TIMBER

The previous chapters have set out the divergence between an immense potential for home-grown and reclaimed timber, which remains entirely theoretical today, and a practice which demonstrates recurring barriers, which are mainly systemic rather than individual choices. Unlocking these requires a system shift on all levels of the value chain from (raw) material supply to delivery of retrofit, repair, maintenance and improvement activities.

The opportunity for wood-based products using home-grown or reclaimed timber in retrofit, repairs, maintenance and improvement could be huge given the overall need for these activities and the types of products required. Investment into retrofit, RM&I is already significant and predicted to increase. However, timber products are rarely specified where cheaper alternatives are available (e.g. UPVC windows and doors, carpet flooring). While chipboard, MDF and OSB manufacturers (e.g. skirting boards, kitchen and bathroom furniture, timber frame component) use both home-grown and reclaimed timber in their products, this is not the case for window manufacturers currently supplying to social housing, nor for internal door or flooring manufacturers. In addition, where timber products are specified (e.g. windows, internal doors), they are often procured from manufacturers that are based outside Wales or even the UK and are using neither home-grown nor reclaimed timber, thus not contributing to the local, regional or national economy.

The current barriers to adoption of wood based products in retrofit are significant, regardless of their provenance and timber source, and aren't solely a matter of perception and goodwill, although clients willing and able to take risk and pay associated costs are essential.

The ROOT Hub is developing a dynamic marketplace to facilitate better use of local resources in construction, such as home-grown and reclaimed timber. On its own this will not solve the issues around product cost and availability at the level of social housing requirements or regulatory barriers to using biobased materials in retrofit, but it will start giving a space to exploring opportunities and using them on a small scale level to generate the case studies the industry (including finance and insurance) will need as proof of concept.

Unlocking this market will undoubtedly require a shift in practice and delivery of healthier homes, which itself demands a cultural shift in manufacturing as well as in procurement and specification. A stronger focus on embodied carbon in these markets could be part of a set of levers. Policy and a commitment to using biobased materials in public buildings can certainly support this shift. Looking at policy levers supporting procurement decisions in social housing retrofit, RM&I that could help drive change on the supply side, we are suggesting the following questions for future enquiries:

- How could achieving the requirements for PAS 2030 and 2035 become more accessible for products and installers? What would support the industry to achieve these in the face of missing demand that would justify the significant investment?
- How will WHQS 2023 drive demand in insulation and other retrofit elements in the light of an alleged funding gap (CIH 2023) and a significant increase in material cost?
- How could the Major Repairs Allowance (MRA) as an important funding instrument better support decarbonisation in retrofit projects?
- How could ORP funding better embrace a more holistic approach to retrofit supporting biobased fabric choices in right balance with renewable energy choices?
- What role could employers requirements play to support greater uptake of products made from home grown and reclaimed timber?

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Woodknowledge Wales Limited
22 Cathedral Road, Cardiff, CF11 9LJ