

Wood buildings keeping carbon out of the air

Andy Leitch , Sam Hart and **Stef Kaiser** look at how channeling more wood into construction can contribute to a Green Recovery by storing wood carbon in long-life products and replacing carbon-intensive materials.

This article follows up on the Green Recovery roadmap and focuses on potential opportunities to significantly increase the amount of homegrown wood-fibre used in long-life construction products. Increased tree planting has been identified as an efficient and low-cost way of sequestering carbon and, therefore, contribute to climate change mitigation – but only temporarily. Once trees are felled, it is paramount to ensure that the carbon captured by trees remains stored in wood products as long as possible. Channelling more wood fibre into the construction sector is a realistic opportunity to achieve this and, at the same time, reduce emissions and resource use by replacing more CO₂-intensive construction materials.

The construction sector - a green opportunity

The construction industry in the UK is one of the largest consumers of materials, whilst simultaneously producing more waste than any other sector. The importance of sustainability in construction is now at the forefront of change due to the declared climate and nature emergency, net zero carbon ambitions and pressure on

finite natural resources.

The increased use of wood in construction has been identified as one simple and largely cost-free way of capturing carbon. This is a message that has been taken up by the Committee on Climate Change and is echoed in the Scottish Government Climate Change action plan and the UK Government 25-year Environment plan, which has led to recent positive discussions between Confor and Defra on developing a roadmap to achieving this goal.

Timber is ideally suited to Modern Methods of Construction (MMC) – mainly offsite construction - providing tried and trusted timber frame and engineered timber technology, capacity, thermal efficiency and unmatched sustainability. It's a solution widely used in Scotland, where around 85% of new homes are built in timber, compared to less than 20% in England.

There is, therefore, a huge potential not only to use more of the existing timber elements in UK construction, but also to develop new ways of using woodfibre in MMC.

Which material are we supplying to the construction sector?

Currently, UK construction demands softwood, whitewood sawn timber to which

British spruce is ideally suited. The other main wood-based product used in construction is panel board (particle and fibreboard). The main products currently produced from homegrown wood fibre for construction purposes are C16-graded and ungraded sawnwood, and wood panel board such as OSB, MDF and chipboard. These products compete with imports in a competitive market.

2019 UK production of main products

- 3.5m m³ of sawnwood
- 3.2m m³ of wood-based panels

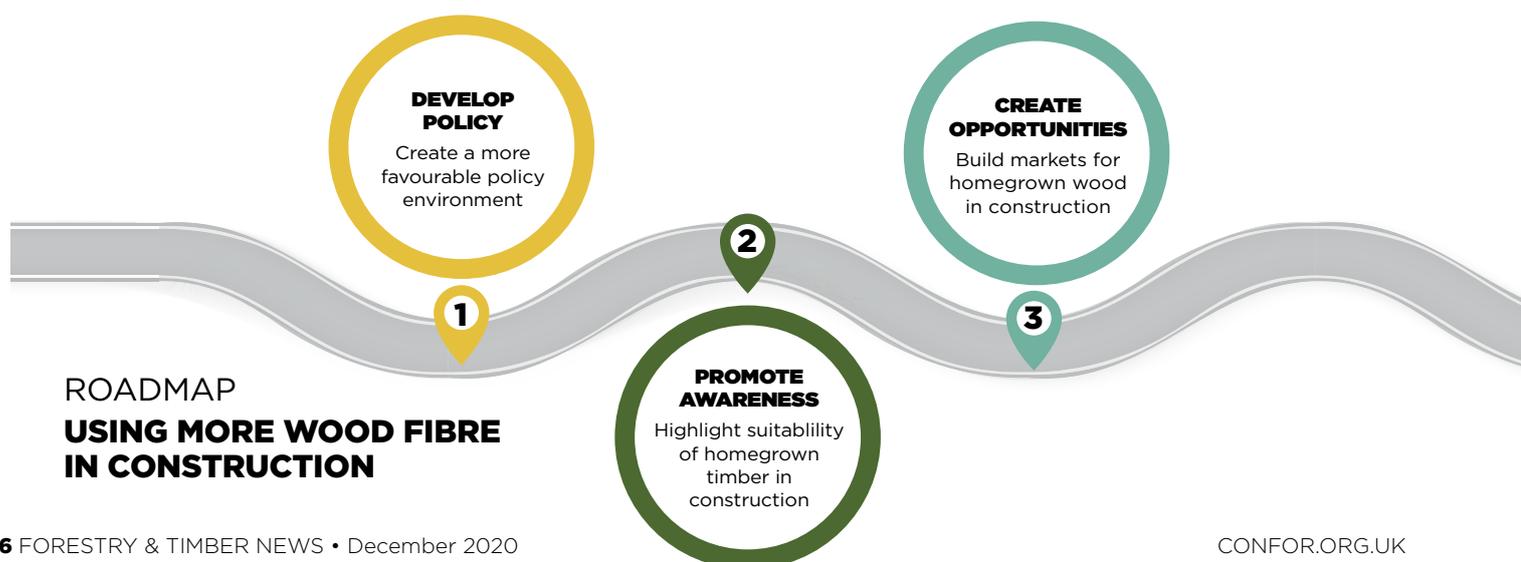
Comparable imported timber volume

- 7.0m m³ of sawnwood
- 3.7m m³ of wood-based panels

If the UK is to achieve its ambitions of reducing reliance on wood-based imports and increase the level of carbon stored in construction, it is paramount that the evolving woodland creations strategies acknowledges the importance of productive species to achieve this goal.

To a lesser scale, but increasing, there is also production of engineered products such as I-Joists and specialist products such as cladding, purlins, large dimension beams and other niche products.

It should be noted that only around 35% of homegrown sawnwood is directed to the construction market, the remainder supplies the fencing and packaging markets.



ROADMAP USING MORE WOOD FIBRE IN CONSTRUCTION

1 Create a more favourable policy environment

The industry has to work with governments to implement policies that favour and facilitate the widespread use of wood products in the UK construction sector.

In addition to the ambitions of the UK Government's climate change ambitions, three existing policies, if aligned, have the potential to effect change: the goal of increasing building to a target of 300,000 homes a year by the mid-2020s; Brexit; and the 2050 Net Zero CO₂ emissions law. Whilst these might help move the agenda forward, they are unlikely to deliver transformational change without additional government intervention through more direct policies to mandate greater use of natural materials within the construction industry.

Therefore, to accelerate the widespread adoption of safe wood-based construction products and systems we need to leverage the compelling research evidence, in addition to ongoing project outputs, to support the implementation of policies similar to those undertaken in other parts of the world such as France earlier this year, where the state an-

nounced that 50% of all publicly procured buildings must be constructed from timber or other natural materials by 2022.

The adoption of such policies would certainly increase demand for wood products and could incentivise further innovation in new wood products and systems, which in turn could increase manufacturing and associated jobs in the UK.



What needs to be achieved

1. The acknowledgement within public procurement policies for construction of the climate change benefit of using sustainable natural materials such as wood fibre as long-life products of carbon storage and substitution of higher embodied carbon materials.
2. The introduction of favourable tax treatments for the appropriate use of sustainable natural materials in all construction such as wood fibre for long-life construction products.
3. Creation and introduction of local authority planning policies encouraging the use of wood in construction and internal fittings, such as that adopted recently by Powys County Council
4. Building regulations to account fairly for all relevant evidence of the safe use of sustainable wood products in construction.

2 Promote awareness of timber as a sustainable construction material and the suitability of homegrown timber

A key barrier to the increased use of homegrown timber in construction is the lack of understanding of the true structural properties of British timber and the opportunities for its use in construction as a product and/or component of a systems such as offsite construction.

We must continue to build on the good work done to change perceptions towards timber, in particular homegrown timber, being the 'default' construction material of choice, and to offer relevant and accessible resources for students, architects, specifiers and the public to understand and specify timber as a material. However, we must not neglect the fact that huge amounts of carbon are already stored in buildings in the form of other wood products, not just sawnwood.

What needs to be done

1. Continue campaigns promoting timber as the construction material of choice



CASE STUDY Wood for Good

Confor co-owns Wood for Good which is the UK timber industry's campaign to promote the use of wood in design and construction. The campaign's main objective is to make wood a first-choice material for specifiers and designers by demonstrating the versatility of wood as a building material and modern engineering methods expand possibilities for its application beyond traditional uses.
www.woodforgood.com

Wood CO₂s less

2. Leverage recent research outputs to evidence the suitability of homegrown timber and wood-based products for different construction applications and raise awareness among construction professionals

Significant research has been carried out and continues into the characteristics of home-grown timber species with a view to informing added value use of that material whether as a construction material or other higher value products. Read more about the findings of some of this research done by Edinburgh Napier University and others and how it has informed product development on pages 38 and 40.

Confor and other private sector partners continue to support the valued work at Edinburgh Napier University and others, such as SIRT, to increase opportunities to maximise the value in economic and environmental terms of home grown wood-based products. >>

ROADMAP **USING MORE WOOD FIBRE IN CONSTRUCTION**

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3. Make it easier for construction professionals to specify wood

It is extremely important to ensure that those who make key decisions in the construction process about the choice of materials have all the relevant information readily available. In today's world, this means having relevant wood-product related engineering calculations in digital format and integrated into commonly used engineering software. A small amount of work on this has been completed by Edinburgh Napier University, but much more is required to ensure these calcs are at the fingertips of engineers and other construction professionals.



**CASE STUDY
CLICKdesign**

This transnational project is developing a performance-based specification protocol to enable a software tool for architects, specifiers and the public to embed service life performance specification for wood. This will help increase market confidence with users for selecting wood as a reliable product and enhance an optimised performance of timber in the built environment.

www.bregroup.com/services/research/clickdesign/



3 Opportunities to increase homegrown wood fibre into longer life and potentially multiple life construction products.

Our sector has the potential to channel more of the wood fibre produced into products that keep carbon locked up for longer.

Recent research has identified potential opportunities for increasing the use of wood in construction in both new build and retrofit projects, and opportunities for potential substitution of imported products through new manufacturing activity utilising homegrown fibre.



**EXAMPLE
Mass timber**

Mass timber, such as CLT, glulam and others, is an opportunity to store even more carbon in high-rise buildings, as it replaces concrete and other materials in weight-bearing structures.

Over the last five years, research has established the feasibility of a UK mass timber manufacturing facility, something that is yet to be developed at scale in the UK, despite increased interest over recent years. This facility would have the potential to supply the UK with mass timber structural elements that, when specified, are currently imported from Europe. More on page 40.



**EXAMPLE
Wood fibre insulation**

Through the Scottish Forest and Timber Technologies Industry Leadership Group a project is currently being scoped to explore the viability and commercialisation of homegrown wood fibre insulation products. If successful, this could further increase the potential to store even more carbon through wood-based products in new build and retrofit markets. One of the aims of this project will be to bring together the various parties across the UK that have already shown an interest and/or carried out some research in this product to minimise duplication of work.

Opportunities for wood-based products in construction

Increase in the use of wood-rich construction for new build and retrofit across all UK market segments (housing, commercial and public sector building, and infrastructure):

- Engineered timber products, such as solid laminate engineered wood (CLT and glulam), wood panel board products, I-Joists, wood fibre insulation and timber cladding where appropriate.
- Offsite manufacturing: enhanced panelised, volumetric and hybrid systems.

New manufacturing of wood-rich products currently imported:

- Solid laminate engineered wood such as cross laminated timber (CLT) and nail or dowel laminated timber (NLT or DLT).
- Increased manufacture of industrialised timber technologies and enhanced offsite timber construction.
- New or enhanced wood panel-based products.
- Wood fibre insulation.
- Panel-based retrofit products.
- Timber facades and cladding.
- Modified timber products (durability or fire protection).

