



Confederation
of Timber
Industries

Why timber is leading constructions Net Zero recovery

Thought Leadership

Confederation of Timber
Industries

August 2020



Build Back Better

we can choose
a better way, by
building with wood

Wood
CO₂s
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Wood
CO₂ts
less

FACT 1

Trees capture CO₂ from the atmosphere and store it as carbon



FACT 2

Mature trees are harvested and their carbon is captured and stored in buildings and other wood products



FACT 3

More trees are planted and the size of the European forest carbon sink continues to grow



FACT 4

Using wood instead of other materials saves CO₂ emissions, both through the carbon captured and stored in the wood product and the avoidance of alternative CO₂-intensive materials



FACT 5

One of the simplest ways to capture carbon and reduce CO₂ in the atmosphere is by increasing the use of wood in construction



FACT 6

Using wood in construction is a cost-free solution to carbon capture – reducing CO₂ in the atmosphere





0.9
tonnes
CO₂

stored in a cubic
metre of timber

Wood
CO₂ts
less

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AN OPPORTUNITY TO MAKE REAL CHANGE

As we emerge from the COVID-19 crisis, we have the most united construction industry in living memory, a Government willing to invest in retrofit and rebuild, and alignment on goals such as decarbonisation and manufacturing via the Road to Recovery. Now is the time to transform the industry.



The current crisis has been unprecedented, and before us is an incredible opportunity to reinvent a construction industry which has over the last five years found itself in the firing line of both politicians and the public - whether for the low quality of buildings, which was brought sharply into focus by the Grenfell Tower fire, the Hackitt Review which followed, as well as Mark Farmer's earlier report on modernisation.

There is broad agreement amidst the housing and climate crises, and within this pandemic, on the direction of travel. We need to build more houses, quicker, and better quality, all while reducing carbon emissions. At a glance this may seem a paradox. Increased construction activity, at higher speeds, might usually be associated with an increase in emissions and decrease in quality.

However timber construction is providing a way forward. Whether you look to North America, Australasia, EU or right here in the UK, you can find examples of innovative uses of emerging materials such as Cross Laminated Timber or Glulam, where wood has been engineered to the degree it can displace energy intensive carbon emitting materials such as steel and concrete.

The World Economic Forum, in their most recent report on The Future of Nature and Business estimated the value of the timber building economy would reach £45bn per year by 2030.¹ There is a ripe opportunity for the

industry to take off as clients demand better construction which has a minimal impact on the environment amidst social trends which continue to grow and evolve.

Architects Declare has attracted hundreds of firms from across the UK in declaring a climate emergency, and their first report issued in June 2020 showed clients and their staff both demanding changes,² as has RIBA's Climate Challenge. They have been joined by a global Construction Declares network, including engineers and large firms.

Independent bodies such as the Committee on Climate Change (CCC) have reported that favouring timber over high carbon materials such as concrete and steel is one of the most effective ways to reduce emissions, calculating that if 270,000 homes were built out of timber, this would absorb and store 3,000,000 tonnes of carbon per year.³

Whether you are involved in retrofit or new build housing, we invite you to engage with us and join in on the future of construction.

Roy Wakeman OBE
Chair, Confederation of Timber Industries

THE PROVEN MANUFACTURING SOLUTION

Quicker to construct, cost effective and with impeccable environmental credentials, structural timber systems should be the number one choice for any building in the UK, writes Andrew Carpenter, chief executive of the Structural Timber Association.



The popularity of structural timber systems in the UK has steadily grown in recent years, but there remains a clear divide across the UK in new build housing. While these systems have been embraced in Scotland, where they represent 83% of new builds, this falls in England and Northern Ireland to 22.8% and 17.4% respectively, with Wales slightly higher at 30.7%.⁴

Climate experts have called for rapidly increasing the use of timber,⁵ which in our view represents a huge opportunity to deliver on homes and the Government's Net Zero 2050 target. This is because timber is sustainable, with multiple trees planted in the place of any harvested, creating a form of Carbon Capture and Storage while providing the industry with a renewable construction material.⁶

The benefits of using structural timber systems is not simply confined to the obvious environmental benefits it delivers, as research shows that houses built up to 30% quicker using such systems, as compared to traditional methods such as masonry,⁷ and with a lot of the work done offsite, there is a 90% reduction in waste.⁸

It has been pleasing to see the UK Government recognise the importance of the construction industry during their response to the COVID-19 triggered economic crisis, both in the ongoing recovery and in reducing carbon emissions.

Already projects due to deliver more than 70,000 homes have been selected to receive a share of £1.1bn from the Housing Infrastructure Fund.

As we have long said, with sufficient demand and the right policy framework in place, the UK structural timber industry can deliver more than 100,000 homes per year. The kind of support being shown during the COVID-19 recovery by Government is encouraging our work to reach this target.

The Construction Leadership Council and Government have stated that we do not want to return to the industry we left behind, and that the 'new normal', and the Net Zero construction approach in particular, must be front and centre any roadmap to a green recovery.⁹ Structural timber systems are well-placed to help the UK economy recover from COVID-19 with pace within this framework.

Firms and professionals well versed in structural timber systems will also be well placed to benefit on this road to recovery, as well as create a more productive, sustainable, and less wasteful industry. Our members are at the forefront of the wood revolution – employing timber frame, structural insulated panel systems, and mass wood construction in the form of Cross Laminated Timber and Laminated Veneer Lumber.

As you see in this report, projects our members work on are standing out across the UK, including the Stirling Prize winning Goldsmith Street. This demonstrates architectural flair is not compromised, but rather enhanced by such systems, with our innovative buildings underpinned through our quality assurance programme [STA Assure](#).



Photo credit: Tim Crocker

CASE STUDY	Goldsmith Street, Norwich
YEAR CONSTRUCTED	2018
ARCHITECT/ MANUFACTURER	Mikhail Riches, Cygnum
DESIGN AND BUILD FEATURES:	<ul style="list-style-type: none"> • This Sterling Prize winning project consists of 105 social housing units, a mixture of 45 houses and 60 flats all built to the rigorous Passivhaus Standard • Seven terrace blocks arranged in four rows and bookended by three-story flats, the design exploits angled sloping roofs to maximise daylight throughout the development and prioritises pedestrians over cars. • Future maintenance has been minimised by designing flats whereby every flat has a front door onto the street, with its own staircase and lobby at street level- designing out all internal common parts. • The design seeks to provide sunny, light-filled homes with very low fuel bills of approximately £150 per year. In the main, these properties will be socially rented. • The intermediate floors and roofs were factory assembled cassettes with the cellulose-insulated zone to the roof using 400mm engineered joists.

GETTING RETROFIT RIGHT

We cannot meet our climate objectives without major improvements in UK housing. This is a fact, plainly stated by the UK Committee on Climate Change, and self-evident to many of us who work in the sector, writes Helen Hewitt, chief executive of the British Woodworking Federation.



One of the few positive aspects of the downturn from quarantine is that it has remotivated Government investment into improving our existing housing stock, of which 85% will still be standing and in use in 2050.¹⁰ Energy use in homes accounts for about 14% of UK greenhouse gas emissions.¹¹

The Chancellor's Green Homes Grant scheme is expected to go live in September, with around 650,000 homes covered by the grant in England, which provides two-thirds of the cost, up to £5,000, for energy efficiency focused home improvements.

Any focus on improving the UK's existing housing stock is positive, but the best results will come from taking a house-as-a-system approach. Retrofit when done right addresses poor thermal efficiency, indoor air quality, moisture, and over-heating, all of which are growing issues and can be exacerbated through poor workmanship and material selection.

Timber is extraordinarily long lasting when designed, treated and installed appropriately. Looking at wood windows, an independent study by Heriot Watt University found that the expected service life of a wood window frame made to a specification set by the Wood Window Alliance (WWA) was between 56 to 65 years in average UK conditions.¹²

This is almost double that of PVC-U window frames, which were found to have an expected service life of 35 years¹³ in the same average

climate conditions.

As a building material, timber sourced sustainably is a great way to help the UK meet net zero carbon targets by 2050. Timber sourced from sustainable forests means that more trees get planted than harvested, and provides a proven way to reduce carbon dioxide in the atmosphere.¹⁴ Wood products are carbon stores and growing forests are carbon sinks.

Across the whole industry, woodworkers and joiners in the UK offer unparalleled quality and sustainability to UK homeowners. From wooden doors, to softwood skirtings or flooring panels, there are many ways wood can be used to improve a home's energy efficiency, internal air quality, value, and aesthetic performance. Not all materials are made equal, and it is important to consider the long-term outcomes of retrofit.

The retrofit agenda is here to stay. Construction professionals wishing to make an environmental impact, improve the health of the occupants, and the life of the building, will do well to take a material first approach and add timber to their consideration list.

A material first approach, and designing for the long-term, are also fundamental to the development of the circular economy, as they help to ensure that the whole life carbon cost is considered, and not just operational carbon.

More detail on whole life carbon costing can be found on the BWF CPDi platform: <https://cpdi.bwf.org.uk>.



Photo credit: Arden Windows

CASE STUDY	Lisgar Terrace, Fulham
YEAR RETROFITTED	2018
ARCHITECT/ MANUFACTURER	Ecobuild, Arden
DESIGN AND BUILD FEATURES:	<ul style="list-style-type: none"> • The blocks at Lisgar Terrace were built in 1927 and are a fine example of Victorian architecture although the timber sliding sash windows which were nearly 100yrs old where in need of replacement. • Having met with the lead architect at Ecobuild, Arden were appointed as the window contractor to replace the sliding sash windows with their Kinward design modern spiral balance window. • Arden were able to meet all of the up-to-date building regulation requirements including providing a sliding sash window certificated to Secure By Design standards. • Arden's Kinward sliding sash windows are available as a traditional Weights and Pulley's option, Modern Tilt and Slide and a semi-concealed version offering u-values as low as 1.1w/km2. • Following on the success of this work, a Phase 2 of windows is planned for the coming year.

DECARBONISING THE CONSTRUCTION INDUSTRY

Our built environment accounts for around 40% of the UK's carbon emissions. This means in the construction industry we have both the power, and responsibility, to combat climate change, writes David Hopkins, managing director of the Timber Trade Federation.



The UK is not alone in facing an aging building stock, a housing crisis, and a climate emergency. As we step forward into Brexit, and with COP26 fast approaching, it will be important that the UK shows leadership a burgeoning worldwide green construction market.

While heating and other forms of operational carbon continue to be a focus of Government policy, most recently in the Future Homes Standard,¹⁵ embodied carbon, which consists of the construction and life cycle of the buildings materials, has evaded policy officials in the UK. One of the issues has been measurement.

Whereas there are a range of well understood and widely known means to look at a building's operational carbon, embodied carbon has only recently become part of the construction industry's vernacular.

But in a new building, the embodied emissions from construction can account for up to half of the carbon impacts associated with the building over its lifecycle.¹⁶ Without tackling embodied carbon there is no 'Zero Carbon' construction, and we will not have decarbonised the construction industry.

Each year around 48 MtCO₂e (6% of the UK's total emissions) come from embodied carbon, with more than half of this relating to the materials used in buildings.¹⁷

While concrete has been the most ubiquitous construction material of the twentieth century,

were it a country, cement, a key component of concrete, would be the third biggest carbon emitter, after China and America.¹⁸ Carbon emissions are inherent to cement, which remains an integral ingredient of concrete.¹⁹

Using alternative materials such as timber, which absorbs almost a tonne of carbon dioxide per cubic metre of wood, is one of the simplest ways to tackle climate change in construction.²⁰ Engineered timber allows wood to be lent a greater strength-to-weight ratio than steel.²¹

Other countries are seeking to tackle the issue, and this can be seen in the wood encouragement policies from Europe to the Americas and Australasia, where timber offers itself as a renewable, resilient building material, and a form of Carbon Capture and Storage.²²

The UK Committee on Climate Change has repeatedly called for a rapid increase in the use of sustainable timber in the UK to tackle climate change, displacing materials which are major greenhouse gas emitters.²³

Overcoming the climate crisis needs leadership from Government, and industry - from those who take up the call and opt for sustainable, replenishable building materials, rather than relying on traditional materials and methods best left in the twentieth century.

Find out more about the sustainable timber trade at: www.ttf.co.uk/.



Photo courtesy of Wood Awards

CASE STUDY	The Spinninfields Pavilion, Manchester
YEAR CONSTRUCTED	2018
ARCHITECT/ MANUFACTURER	Sheppard Robinson, Stora Enso
DESIGN AND BUILD FEATURES:	<ul style="list-style-type: none"> • The building is a highly innovative, four level structure formed of an externally expressed Glulam frame. • Long, uninterrupted spans of 6m, and a slim-profile floor build up to match the slim perimeter glulam beams, have been achieved by use of pre-fabricated CLT and Glulam Rib-Panels for the floors. • Stora Enso have calculated that a total of 289.64 m³ of CLT and 172.42 m³ of glulam was used for the rib-panels and frame of the Pavilion, which equates to 338 tonnes of CO₂ being removed from the Earth's atmosphere. • The strong gridded form of the building's exterior showcases the aesthetic Austrian spruce and larch. • External steel diagonal bracing helps give rigidity to the overall structure, and in doing so has made it possible to create 6m cantilevers in the structural bays at either end of the building.

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Governments should use more wood

says Committee on Climate Change

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Confederation
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Industries

Building

VIRTUAL ROUNDTABLE

WHY TIMBER IS LEADING CONSTRUCTION'S NET ZERO RECOVERY

Amidst calls from the Construction Leadership Council for the industry to 'reinvent' itself in the Road to Recovery, manufacturing and decarbonisation are set to be of increasing importance as firms seek to rise to a rapidly evolving set of demands from major clients, including Government. Thanks to the ability of wood to absorb and store carbon, modern engineering and innovation, and ease of use for manufacturing, wood is rising to prominence as a construction material of the future.

Hear from our speakers on the role of timber in our recovery, achieving Net Zero, as well as a comparative view of France which recently introduced a requirement for public buildings to be 50% timber.



Simon Rawlinson,
Partner, Arcadis



Jonathan Falkingham,
Co-Founder of Urban Splash



Silvia Melegari,
Secretary General of the EOS

AVAILABLE NOW ON DEMAND

www.cti-timber.org



Confederation of Timber Industries

As an umbrella organisation, the CTI represents the UK's timber supply chain - a source of around 350,000 jobs across the skills spectrum and worth almost £2bn to the UK economy.

Disclaimer: This report is only meant as a snapshot of current thought leadership, and should not be taken as representative of all views of the timber industry.

Acknowledgements

Special thanks to all who contributed to this report, including Confederation of Timber Industries members the British Woodworking Federation, Timber Trade Federation, Structural Timber Association, Trussed Rafter Association, and Wood Protection Association.

Pictures and case studies were contributed by members, with special thanks to Cygnum/Mikhail Riches, Sheppard Robinson/Stora Enso, and EcoBuild/Arden for sharing their case studies.

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