# THE COP26 HOUSE

## DESIGN FOR RECONSTRUCTION



# Foreword



“The UK urgently needs housing that meets people’s needs without compromising the needs of future generations.

The COP26 House shows how modern timber construction can help transform our housing system - reducing emissions, strengthening rural economies, and creating homes that foster wellbeing.

It is an example of the kind of integrated, regenerative approach we must champion if we are serious about addressing both the housing crisis and the climate crisis together.”

**Arianne Burgess, Scottish Green Party.**
**March 2026**



“To meet our climate targets, we need to change the way we build our houses in the UK.

Our UK forests have an important role to play – absorbing carbon as they grow and providing sustainable timber for our buildings, reducing the reliance on carbon-intensive cement and bricks.

The COP26 House shows how we can deliver low carbon houses using homegrown timber.

I am excited to see how this develops in the near future.”

**Mary Creagh MP**
**Minister for Nature 2024-26**

Grown in Britain · Rothie Cabins · Scottish Forestry / Coilltearachd na h-Alba · BSW Timber · BeyondZeroHomes · Roderick James Architects LLP · Confor, Promoting forestry and wood · Timber Development UK

# Executive Summary

This is the story of a zero-carbon timber frame house which has been designed, erected, dismantled, then adapted and rebuilt.
On its journey, it has shown how much can be achieved through collaboration and shared ambition.
The COP26 House is a scalable blueprint for zero-carbon, truly circular design and construction,
and a reminder that the solutions to some of our biggest problems are already out there.











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This case study is an educational tool, reference source and a basis for encouraging the uptake and use of homegrown timber and natural low carbon materials in construction. It records a real-life example of circular design in practice.

# Why

The UK Government has committed to becoming net zero by 2050, whilst aiming to build 300,000 new homes per year for the next five years.

An average UK house at current standards emits up to 300 tonnes of CO2 in its projected 60-year lifetime.

That's 450 million tonnes of carbon to offset, to meet our Net Zero target.

The building, operation and maintenance of domestic buildings accounts for 27% of total UK carbon emissions.



In the last 20 years we have demolished over 200,000 homes.

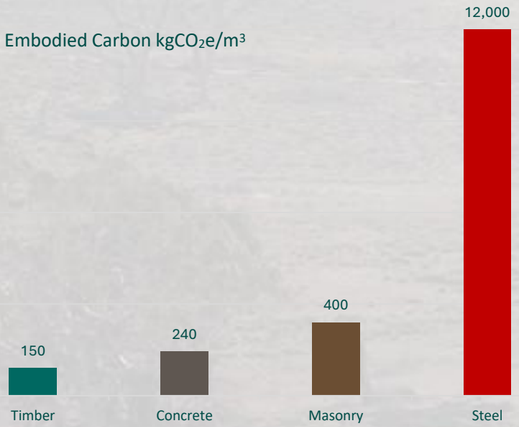
It is vital that the houses we build now are truly sustainable, with much lower embodied and operational carbon.

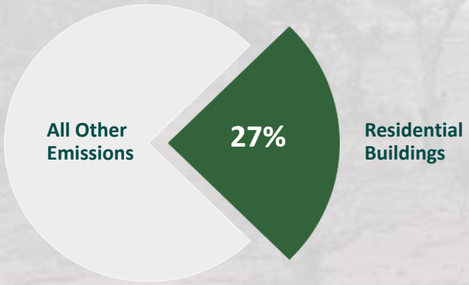
They must last longer than many of their predecessors, and when they come to the end of their lives, they must be easily dismantled and recycled.

We can achieve solutions to most of these issues, by simply using timber.











Facts and figures on this page are from ICE database, UK Government, Green Building Council, National Housing Federation and RICS 2026.

# How

Photosynthesis is powered by light and uses carbon dioxide and water to make glucose and oxygen

And that's where trees come in.
They have a major role to play in removing carbon dioxide from our atmosphere.
They do this through photosynthesis.
The leaves of growing trees absorb atmospheric carbon dioxide, releasing oxygen and locking up the carbon in their timber.
Some of the carbon from falling leaves enters the woodland soil and is stored there for the long term, making the entire woodland ecosystem an important carbon store.



Light hits the leaves.
Carbon dioxide enters through the stomata on the underside of the leaves and water is transported from the roots up the trunk.

Chlorophyll, a green pigment in the leaves, sets off a reaction between the $CO_2$ and the water using energy from sunlight.



The result is glucose, used by the trees to grow, and oxygen released back into the atmosphere as a waste product.

$$6CO_2 + 6H_2O \xrightarrow{\text{sunlight}} C_6H_{12}O_6 + 6O_2$$

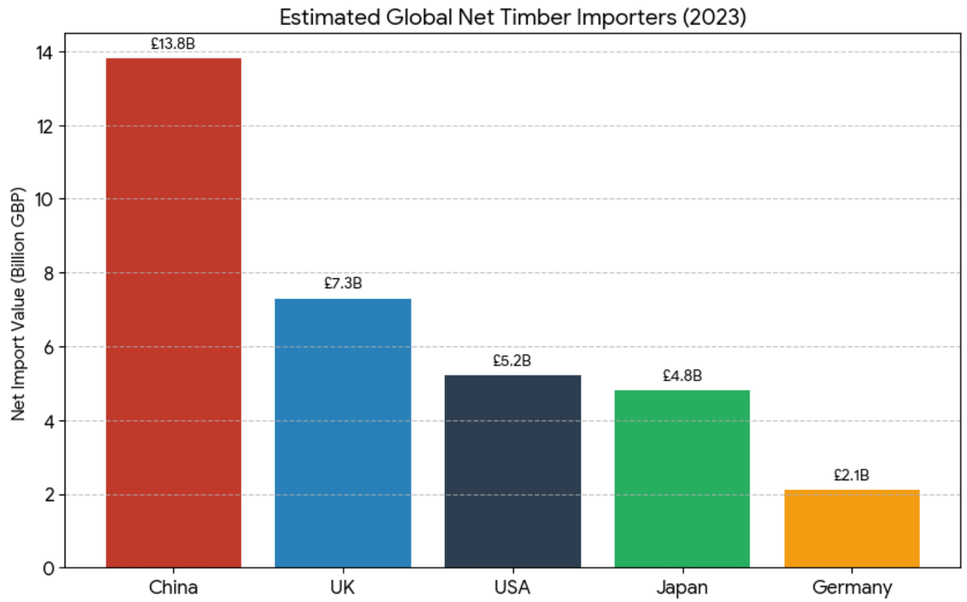
carbon dioxide + water $\xrightarrow{\text{sunlight}}$ glucose + oxygen

The carbon atoms end up inside the glucose and become the building blocks that trees use to grow. It forms the trunk, branches, leaves and roots - a solid tower of carbon providing a lifeline to thousands of species.

Native woods and trees are our allies in the fight against climate change. We need to find the space for them to grow and thrive, locking away carbon for generations to come and safeguarding our planet for the future.

Source: The Woodland Trust.

# Meanwhile…



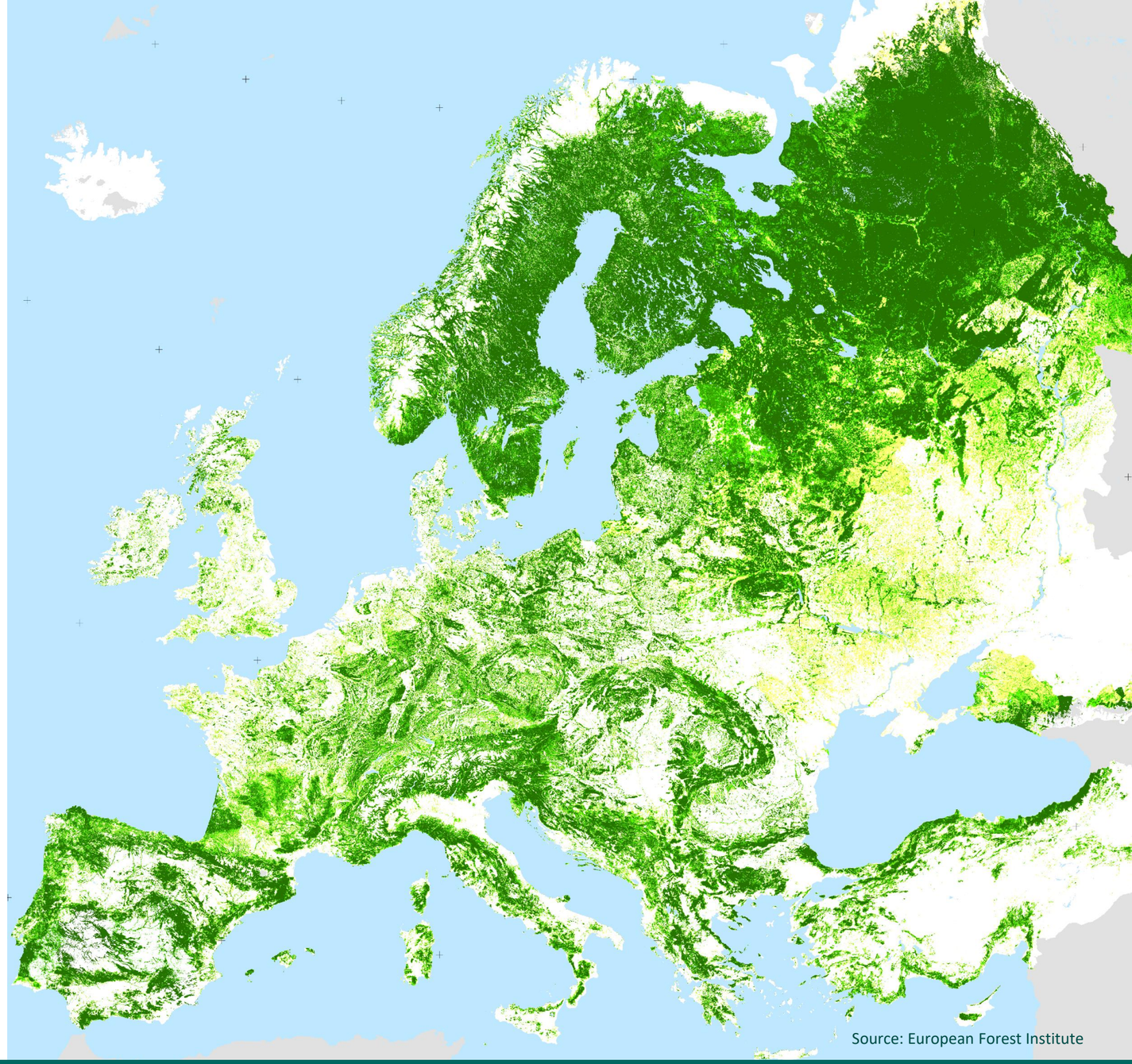

Source: TDUK.

The UK is the second largest net importer of forest products in the world, after China. We also have the lowest percentage of forest cover in Europe.

We spend over £6 billion every year importing timber from abroad.

And yet we have vast amounts of land available for growing our own timber in carefully managed woodlands.

These could be wildlife havens, creating spaces for health and leisure activities as well as providing timber to build our houses, whilst simultaneously capturing CO2 from the atmosphere.



Source: European Forest Institute

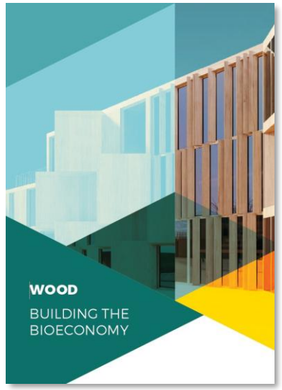
# Government support for timber in construction

**Timber in Construction Roadmap & House of Commons Environmental Audit Committee:**

“We welcome the Government’s aims to increase the uptake of timber in construction.

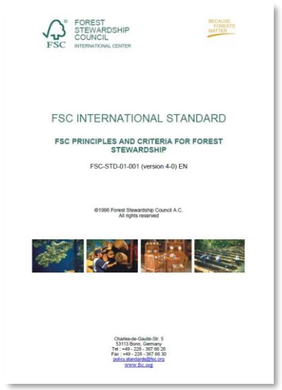
The long-term use of timber in construction has an important role to play in helping the UK to meet its net zero targets.

It is important that domestically-grown timber resulting from the current drive to plant is available for use in construction as far as possible.”



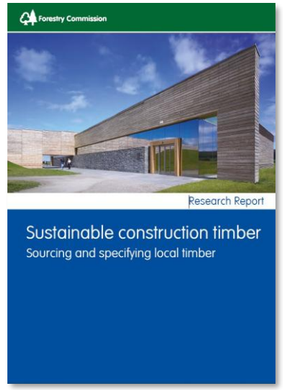






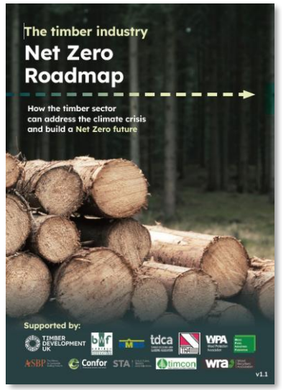














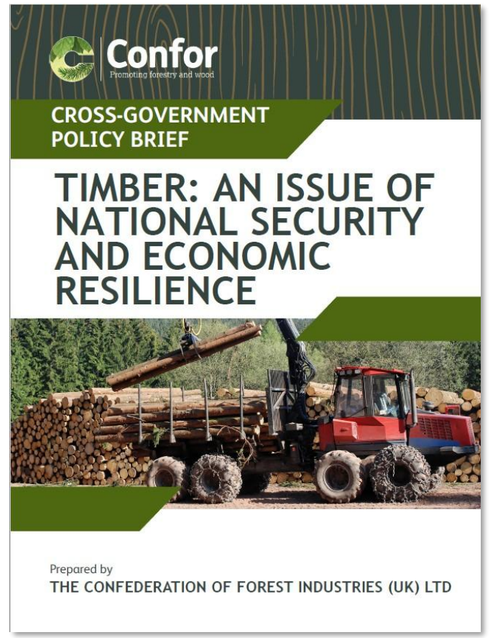











Both Westminster and Devolved Government support for timber in construction is clear and widely known.

The challenge now is for the industry and the markets to adapt and implement current guidance and incentives.

The COP26 House is a perfect example and blueprint for the use of homegrown timber in construction.

# Trust UK C16 Campaign

Confor, in partnership with Timber Development UK (TDUK), is supporting a landmark collaboration between the UK's three largest sawmillers - BSW Timber, James Jones & Sons and Glennon Brothers  - to promote the use of domestically grown and manufactured timber.

The initiative is a call to action for a more sustainable, economically sound future for the UK construction sector - an industry-wide rebalancing of supply chains, focussing on domestic timber production to help futureproof our timber industry.

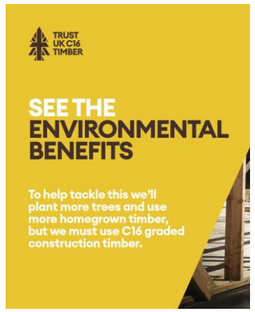


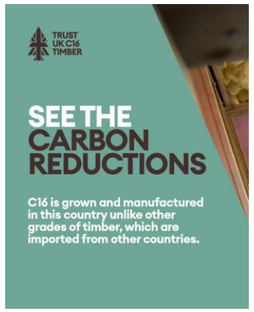












A Four-Step Approach:  The joint campaign lays out a clear strategy.

GROW: Increase and improve tree planting and replanting.

MANUFACTURE: Capitalise on advanced harvesting and sawmilling technology.

SPECIFY: Encourage architects, engineers and contractors to specify C16 timber.

BUILD: Leverage the full capabilities of C16 timber across construction.

"The ready availability of British-grown C16 structural timber makes projects like COP26 House practical, replicable and profitable across the UK.

The critical distinction is between C16, which UK sawmills produce at scale, and C24, which typically requires imports from Scandinavia or Eastern Europe.

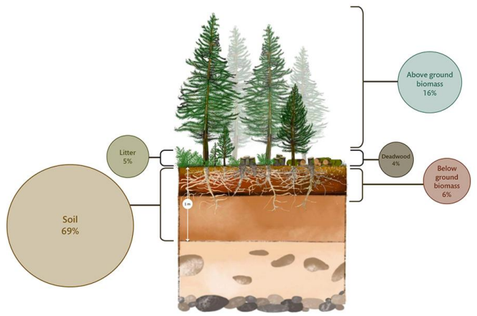
By designing for C16 where structurally appropriate, projects gain the benefits of shorter supply chains, reduced transportation emissions and support for the UK's forestry sector, whilst GiB certification provides assurance of responsible forest management and complete supply chain visibility."

Rachel Lawrence, Business Manager, Grown in Britain.

# Biodiversity and Woodland Management

Mass timber production via quick-grown, monocultural and soil depleting forestry practices risks a false carbon fix that does not follow through for ecology, soil health or carbon storage.

Whilst continuing to advocate for increased use of homegrown timber in place of more carbon-intensive materials, we need to be honest about the urgent need for a holistic, habitat-centred and regenerative approach to forestry.

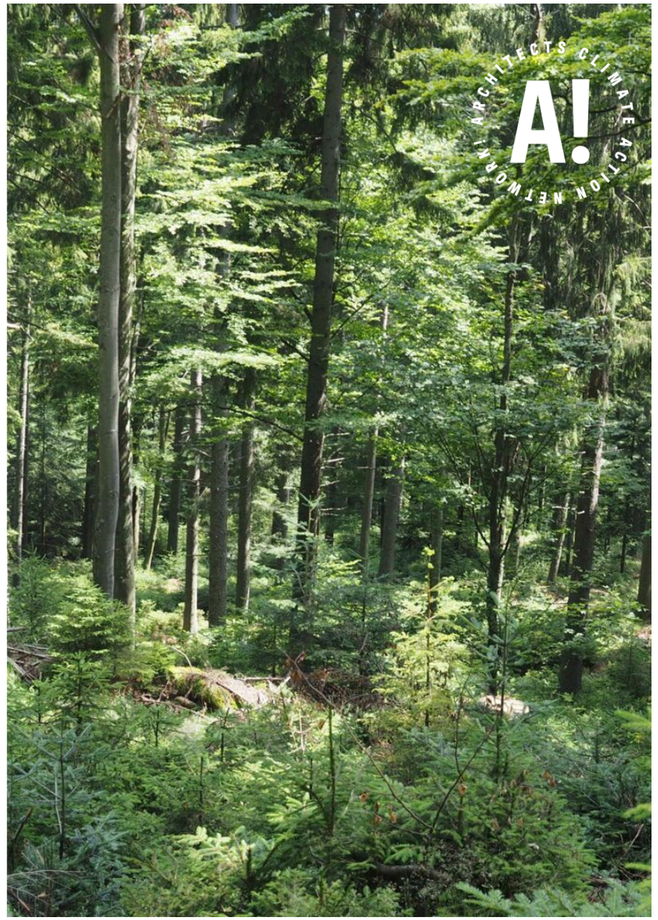



Soil captures 69% of the carbon stored in a natural forest environment. Clear-felling and modern harvesting techniques can destroy this natural balance, releasing the stored carbon from the soil.

Illustration © ForestResearch.gov.uk



© Skidda Skogen




Mixed species commercial forest, Sommereben, Austria © Eckart Senitza

## LESS MONOCULTURE - MORE BIODIVERSITY

UK timber production is governed by the UK Forestry Standard (UKFS), with many forests also certified to the UK Woodland Assurance Standard (UKWAS), facilitating FSC, PEFC, and Grown in Britain certification.

Strict controls limit the amount of single species planting to 65% of woodland area, with new forests over 100 hectares requiring a comprehensive Long-Term Forest Plan with Environmental Impact Assessment.

Modern forest management methods with mixed species, selective felling to ensure continuous cover and careful maintenance can help to enhance our forests.

Commercial viability in competitive markets needs to be balanced with long-term sustainability and biodiversity gains.

Much has improved since the 1970s and 80s, but more can be done to ensure the resilience and sustainability of forestry in the face of rapid and catastrophic climate breakdown.

# Where the COP26 House began

Roderick James Architects have worked with BSW for over two decades, using homegrown UK C16 timber on a variety of houses and community developments.

We invited a variety of suppliers, contractors and consultants to come on board with us to design and deliver a showcase home for COP26.

Our collective aim was to show the world that building houses to net zero standards, using homegrown timber and natural insulation is not just achievable, but can result in beautiful, affordable and comfortable homes.

This collaborative group of companies is known as **Beyond Zero Homes.**







Roderick James Architects LLP

The COP26 House is an adaptation of Roderick James Architects' signature design:  The Barn House

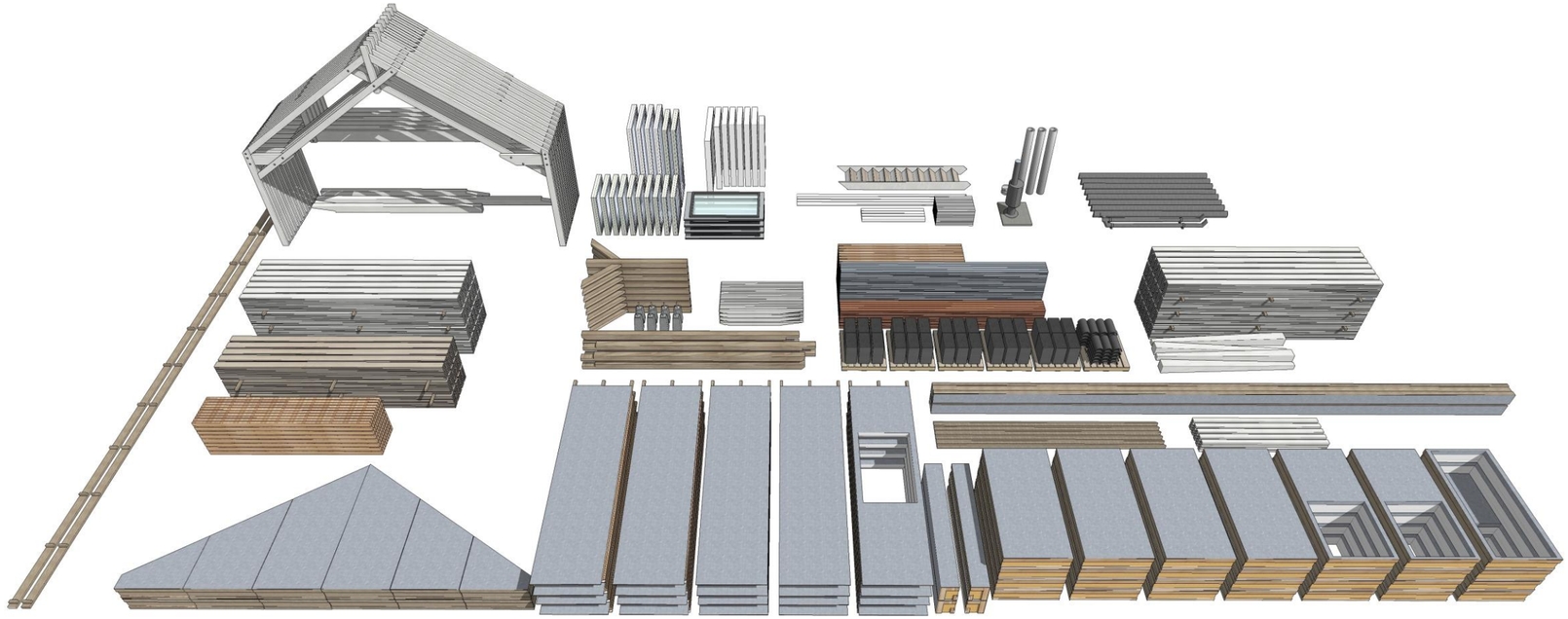
# Analysing the Barn House

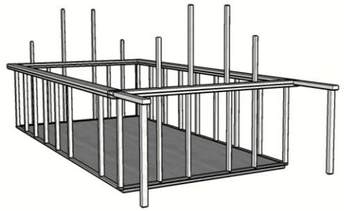
The standard Barn House design and construction was an obvious choice to showcase zero carbon building, being predominantly made of timber structure with woodfibre insulation.

To do this, a full Life Cycle Assessment was carried out, quantifying the amount of carbon produced in construction, compared to the amount stored in the fabric of the building.

Every element in the design was examined in terms of its carbon and overall environmental impact – from sourcing raw materials to end of life.

This process revealed the Carbon Hotspots; mainly concrete and steel in the foundations and fittings, which were then designed out for the COP26 House.





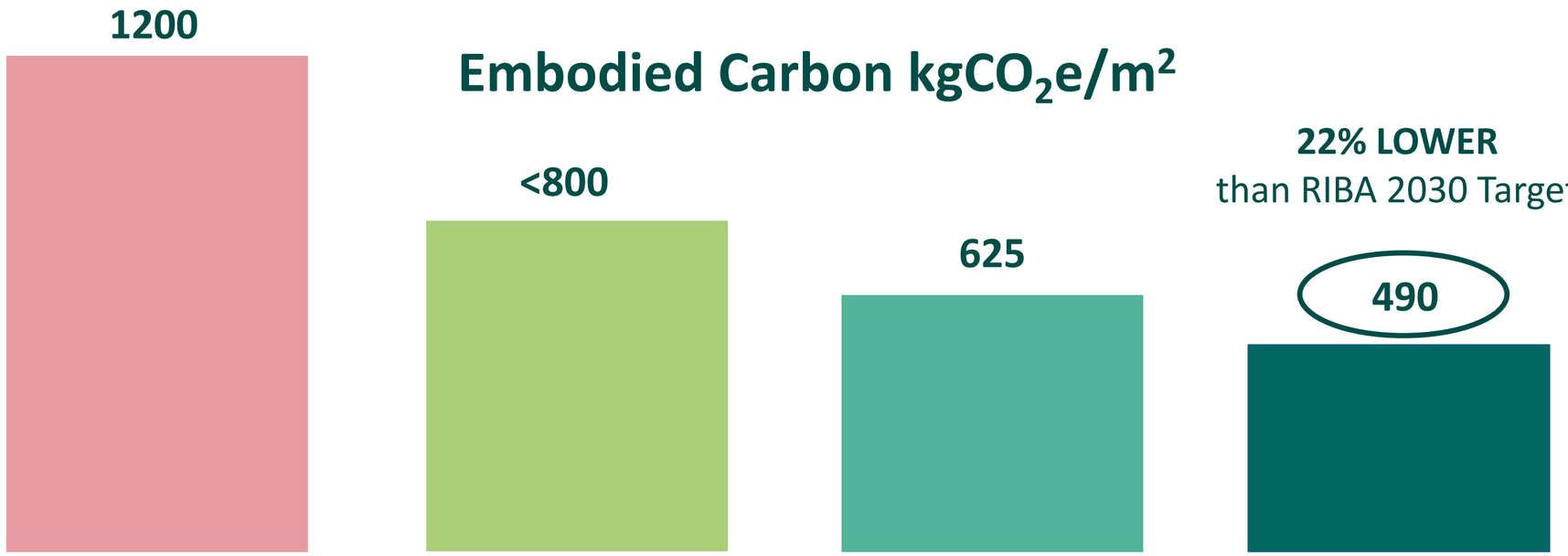


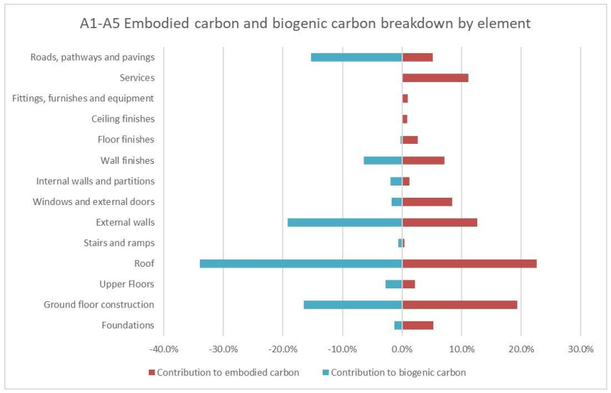


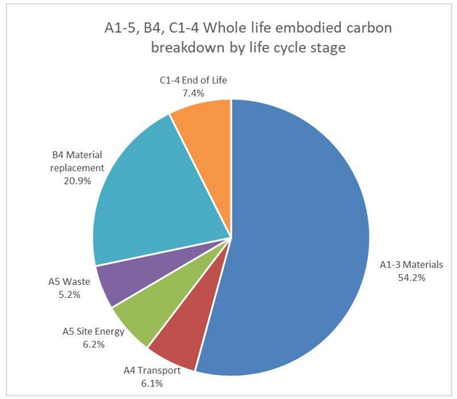


# RIBA 2030 Challenge targets

## Embodied Carbon $kgCO_2e/m^2$




RIBA 2030 Climate Challenge target metrics for domestic / residential

| RIBA Sustainable Outcome Metrics | Business as usual (new build, compliance approach) | 2025 Targets | 2030 Targets | Notes |
|---|---|---|---|---|
| Operational Energy kWh/m²/y | 120 kWh/m²/y | < 60 kWh/m²/y | < 35 kWh/m²/y | Targets based on GIA. Figures include regulated & unregulated energy consumption irrespective of source (grid/renewables).<br>BAU based on median all electric across housing typologies in CIBSE benchmarking tool.<br>1. Use a 'Fabric First' approach<br>2. Minimise energy demand. Use efficient services and low carbon heat<br>3. Maximise onsite renewables |
| Embodied Carbon $kgCO_2e/m^2$ | 1200 $kgCO_2e/m^2$ | < 800 $kgCO_2e/m^2$ | < 625 $kgCO_2e/m^2$ | Use RICS Whole Life Carbon (modules A1-A5, B1-B5, C1-C4 incl sequestration). Analysis should include minimum of 95% of cost, include substructure, superstructure, finishes, fixed FF&E, building services and associated refrigerant leakage.<br>1. Whole Life Carbon Analysis<br>2. Use circular economy strategies<br>3. Minimise offsetting & use as last resort. Use accredited,verifiable schemes (see checklist).<br>BAU aligned with LETI band E; 2025 target aligned with LETI band C and 2030 target aligned with LETI band B. |
| Potable Water Use Litres/person/day | 125 l/p/day (Building Regulations England and Wales) | < 95 l/p/day | < 75 l/p/day | CIBSE Guide G |

The COP26 House already far exceeds the 2030 Climate Challenge set by the RIBA.

The use of timber results in extremely low carbon emissions over the lifetime of the building.

At the same time, the homegrown timber and woodfibre insulation lock away over **50 tonnes of $CO_2$** within the fabric of the building, through sequestration – also known as biogenic carbon.

This house can be described as a **carbon storage facility**, effectively doubling the lifespan of the timber and locking in more carbon than it produces.

*Measured using RICS Whole Life Carbon A1-A5, B1-B5, C1-C4 incl. sequestration.

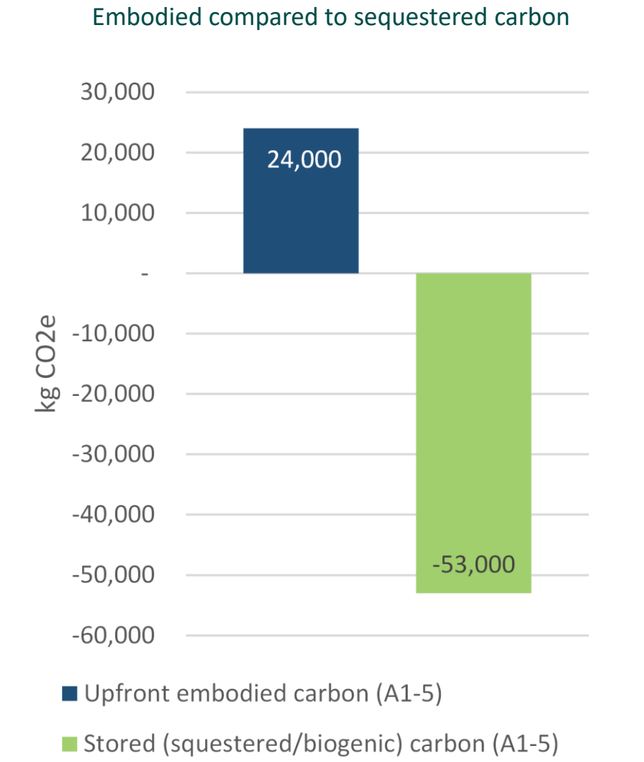
# Biogenic Carbon Credits

It is now possible to certify the amount of carbon stored in the fabric of a building and use this information to claim carbon credits.

This process has been developed by Grown in Britain, who have already certified our timber supplier BSW for Grown in Britain Chain of Custody.

We are working with them to develop this concept and explore how clients and developers can claim carbon credits for timber and biobased building projects.








BIOGENIC STORED CARBON QUOTIENT

Grown in Britain

When we consider the 53 tonnes of biogenic or sequestered carbon stored in the fabric of the building, taking away the upfront or embodied carbon value of 24 tonnes still leaves **29 tonnes of carbon locked away.**

With carbon credits for equivalent systems like Terrestrial Storage of Biomass and Biochar commanding high-quality values around £100 / tonne, the prospect for generating considerable assets through timber and biobased construction suddenly becomes a very attractive and compelling proposition.

Moreover, as it has been designed for deconstruction and reconstruction, the carbon could remain locked away for even longer.

Depending on the cost of certification, the carbon credits for this tiny building could pay for the renewable technologies required to heat it.

The implications for larger buildings and developments with much higher quantities of biogenic carbon are potentially a game changer for the construction industry.

This could represent a paradigm shift which tips the balance in favour of natural biobased materials.

# Building the COP26 House

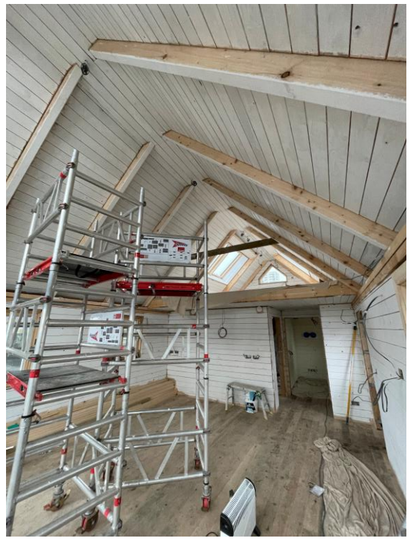
Almost every element is made with homegrown timber and woodfibre insulation: floor, walls, roof, insulation, internal and external cladding.











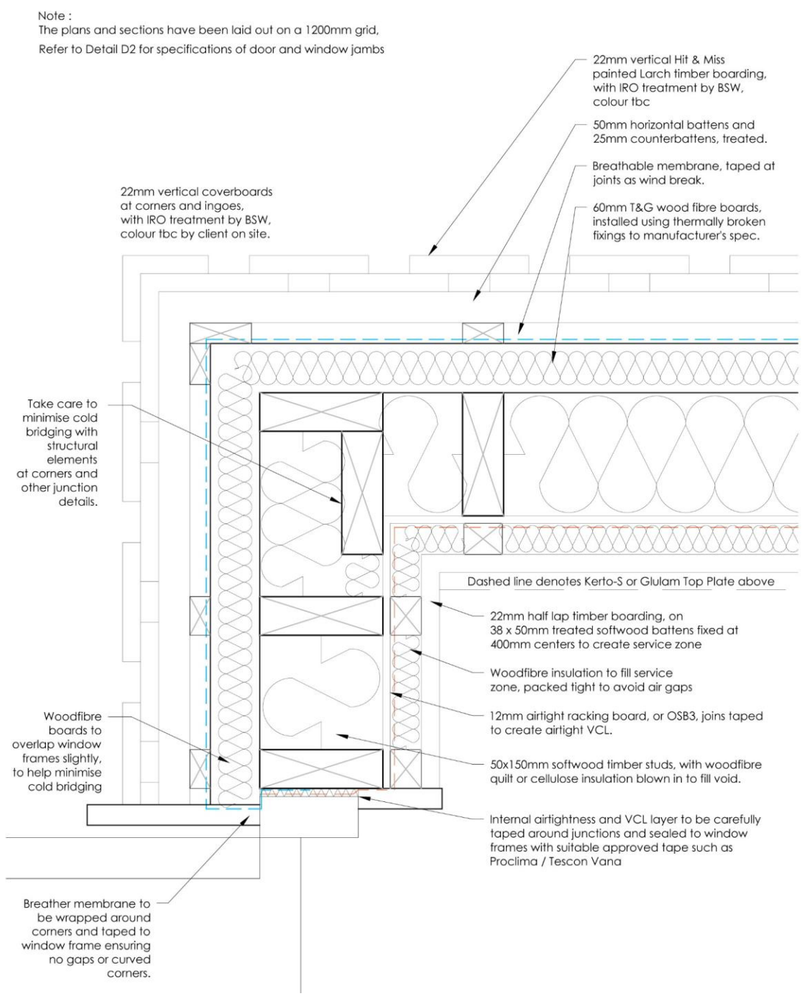


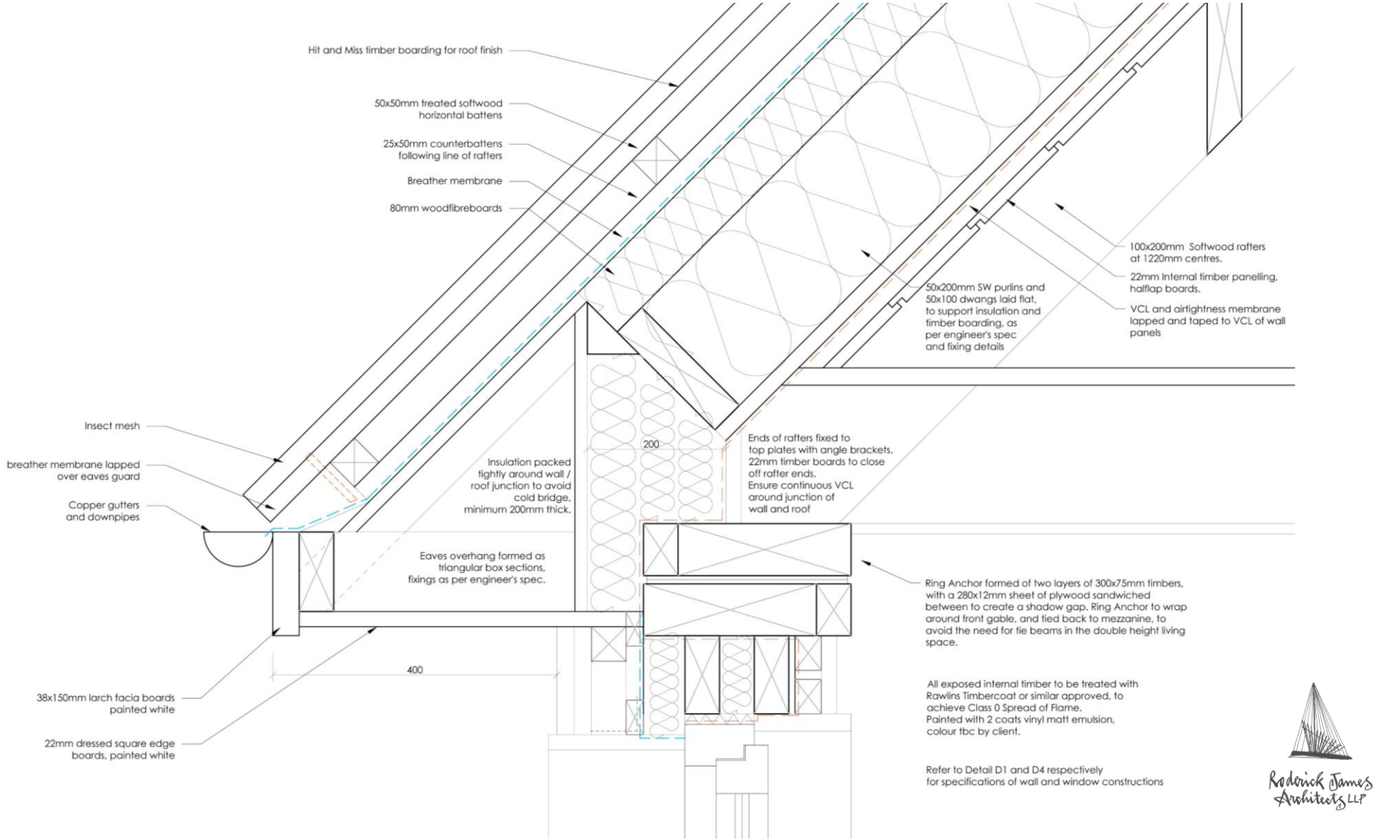



COP 26 HOUSE



# Construction Details, Costs and Timescales




All materials and labour were provided free of charge by Beyond Zero Homes for the COP26 event in Glasgow.

Off-site construction: 2 weeks

On-site construction: 8 weeks

**Approximate Cost in 2021 ~ £140k**

Deconstruction: 4 weeks

Reconstruction: 6 months on site

# Deconstruction

Being designed as a temporary exhibition piece for COP26, a key consideration from the outset was how it would be de-constructed after the event.

All component parts and modular panels were screwed together, rather than glued or nailed, so it could be quickly disassembled in less than one week.

These were then taken away to be kept in storage for over two years, whilst its new owners prepared for it to be rebuilt in the grounds of Rothiemurchus Estate.







# Reconstruction

The COP26 House has now been carefully rebuilt by Rothie Cabins, and has become a sustainable self-catering holiday home, affectionately renamed 'Jim’s Cabin' after the local legend who lived in a similar timber cabin on the same site.

Rothie Cabins is a new business, initiated by Louise and Graeme Fisher, who live and work on the Rothiemurchus Estate near Aviemore.

They have a strong sustainability focus on eco tourism, providing net zero self-catering accommodation and encouraging  conscious travel and awareness of carbon emissions for guests travelling to the cabin.

The key features include:

Eco-friendly products used throughout the cabin

Natural or recycled furniture and finishings

Waste segregation and management

Low carbon travel encouraged

Donating revenue to carbon capture initiatives

Supporting local communities and projects

Visit rothiecabins.com for more information.

Rothie Cabins



















# Rothie Cabins / Jim’s Cabin

The complete reconstruction and adaptation of the COP26 House is a true example of circular economy in action.

We have collectively demonstrated that careful design combined with technical knowledge, foresight and collaboration can deliver high-quality, affordable, healthy homes that help combat the climate emergency.

Homes that are not only fit for modern living, but ones that can also be easily adapted, re-used and recycled at the end of their working lives - buildings that reduce our carbon footprint and provide a truly sustainable legacy for future generations.



“I was delighted to visit the reassembled COP26 house – it is the epitome of ‘hygge’. The whole story, as outlined in the Case Study, shows without a shadow of doubt that the sector in Scotland has the potential to grow, mill, design, manufacture and assemble everything we need to provide flexible, affordable, high-quality and environmentally friendly homes”.

Dr Helen McKay, OBE, FICFor, Chief Forester for Scotland





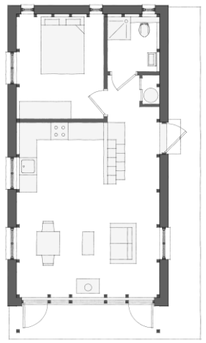


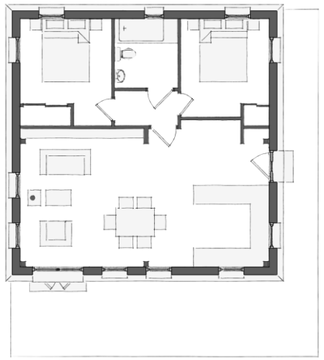


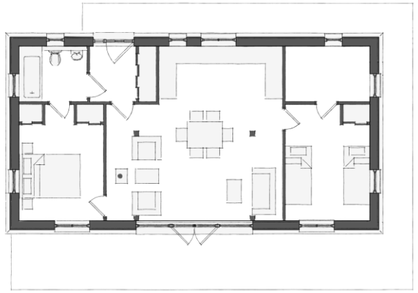


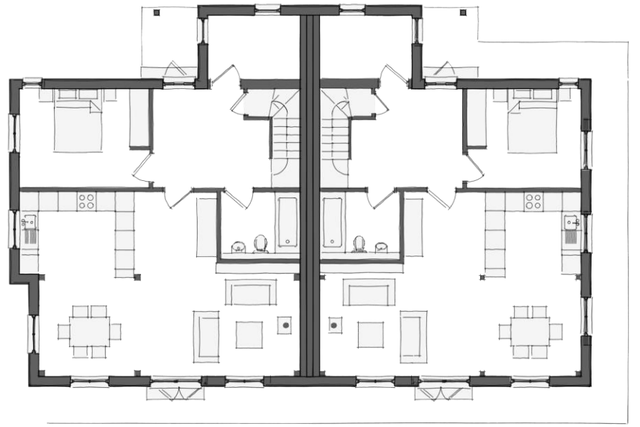
© Niven Photography

# Design Options











The COP26 House
1 bed @ 70sqm
~£210k



The Fair & Square House
2 bed @ 80sqm
~£240k



The Croft House
2.5 bed @ 110sqm
~£330k





The Forester Houses
3 & 4-bed semi-detached @ 130 / 145 sqm
~£390k / £435k

We have full Planning and Building Regulations approval for four further house designs, based on the same build system using homegrown timber and woodfibre insulation.
The system can be adapted to any building type and project-specific criteria. It can be prefabricated in a factory or hand-built on site.
Approximate construction costs are based on £3,000 per square metre in 2026.

# Official Support



‘Mighty oaks from little acorns grow’.

The COP26 House may be small but it tells a big story, a story rooted in the conviction that we can build in a way that can heal rather than harm out planet.

This inspiring story is not fiction, it’s fact, and the challenge to the reader is clear :

‘How do we scale this up?’

**Paul Brannen,**
**Forestry Commissioner and former MEP for Labour**
**Public Affairs Director European Confederation of Woodworking Industries**



“The UK spends billions of pounds every year importing timber from abroad, despite being surrounded by land suitable for woodland. It is therefore astounding that the UK is one of the world’s biggest net importers of forest products in the world.

I recognise that forestry not only has the potential to produce vital timber which could support more sustainable housebuilding and alleviate the housing crisis we face, but forests themselves have a number of environmental and health benefits which as a country we should be making better use of.

I therefore welcome proposals like COP26 House – which aims to make better use of our resources whilst supporting the environment.”

**Finlay Carson, Scottish Conservative Party.**
**Convenor : CPG on Forestry and Wood Processing Industries**
**September 2026**

Grown in Britain
Rothie Cabins
Scottish Forestry
Coilltearachd na h-Alba
BSW Timber
BeyondZeroHomes
Roderick James Architects LLP
Confor
Promoting forestry and wood
TIMBER DEVELOPMENT UK

# BeyondZeroHomes

TIMBER DEVELOPMENT UK









































































It started with an idea; let’s build a showcase Zero Carbon House for COP 26 in Glasgow.

Six months later, thanks to the hard work, generosity and collaboration between individuals and companies represented above, this vision had become a reality.