PROSIECT CARTREFI O BREN LLEOL

THE HOME-GROWN HOMES PROJECT

Social Housing as a UK Carbon Removal Strategy

woodknowledge WALES

Ariennir gan Lywodraeth Cymru
Funded by Welsh Government

Social Housing as a UK Carbon Removal Strategy

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THE URGENT CASE FOR WOOD IN CONSTRUCTION

The compelling opportunity to focus on using timber and other biogenic materials in construction as a Greenhouse Gas Removal (GGR) mechanism was described by Woodknowledge Wales in the report 'Using Wood in Construction as a Significant GGR mechanism[1].' This follow-up report examines its real-world application in social housing.

The UK's legally binding Net Zero targets cannot be met without a significant GGR contribution – estimated by the Intergovernmental Panel on Climate Change (IPCC) to be 75 $MtCO_2e$/year. Wood in Construction (WIC) is the most market-ready, scalable, and cost-effective pathway available, directly aligning with national housing and economic goals.

To illustrate this potential, this report considers three current exemplars at the forefront of timber-based social housing delivery. These examples have been chosen as they are all committed to delivering Passivhaus levels of fabric performance whilst being explicitly based on the use of biogenic materials.

TAI ARY CYD

Tai ar y Cyd is a pioneering Welsh collaboration between 25 social landlords to deliver standardised, high performance open panel timber systems based upon timber.

agile HOMES

Agile Homes, pioneering new business models for social value and carbon monetisation in social housing using their straw insulated timber system.

MAKAR

Natural homes Healthy living

MAKAR, a Scottish leader in advanced timber construction demonstrating two decades of design-led closed panel, wood insulated offsite manufacturing. MAKAR have recently launched an affordable solution designed for the social housing market.

Together, these exemplars prove that a thriving, low-carbon, timber-based housing sector is not a future aspiration but a present-day reality. This report makes the policy imperative clear: it is time to move from discussing theoretical potential to enabling practical implementation.

[1] Using Wood in Construction as a Significant Greenhouse Gas Removal Mechanism, 2025

THE POLICY IMPERATIVE:

Recapping the Role of WIC as a Greenhouse Gas Removal Mechanism

To unlock the full potential of timber, it is strategically vital to formally incentivise Wood in Construction as a GGR technology within UK climate policy. This is distinct from – and complementary to – simple embodied carbon reduction. While substituting carbon-intensive materials like steel and concrete avoids emissions, using timber actively removes existing carbon from the atmosphere and stores it for the long term within a building's structure. In policy terms, this transforms buildings from being merely 'less bad' (lower emissions) to being actively 'good' (a net carbon sink).

Our foundational report, "Using Wood in Construction as a Significant GGR Mechanism," outlines the core principles that underpin this strategy. Its key findings establish a clear case for immediate policy focus:

Official Recognition: International bodies, including the Intergovernmental Panel on Climate Change (IPCC) and the United Nations Framework Convention on Climate Change (UNFCCC), already recognise the long-term storage of biogenic carbon in buildings as a legitimate form of GGR.

Scale and Readiness: Wood in construction is a proven mature technology, rated at Technology Readiness Level 9 (TRL 9), and is ready for immediate, large-scale deployment. This stands in stark contrast to many engineered GGR options that require significant further development. If the UK's target of 300,000 homes per year were met with high-performance timber systems, the potential GGR contribution could reach 6.4 $MtCO_2e$ annually.

Accounting Gaps: Current Whole Life Carbon Assessment (WLCA) methodologies, based on Life Cycle Assessment (LCA), are designed to measure emissions, not removals. They typically assume that all stored carbon is released at a building's end-of-life, recording no net climate mitigation credit from storage. This systemic undervaluation of timber's contribution hinders its adoption.

Economic Viability: The cost of transitioning to timber construction is considered negligible. The primary challenge is not the cost of materials or technology, but the cost of incentivising a necessary shift in established industry practice and overcoming institutional inertia. Therefore, analysing successful, real-world delivery models is the critical next step to understanding how to unlock this vast, market-ready potential.

FROM THEORY TO PRACTICE:

Exemplars in Timber-Based Housing Delivery

By examining the specific models of Tai ar y Cyd, Agile Homes and MAKAR, policymakers can gain insights into the data, business innovations, and established practices that prove the viability of scaling up timber construction. These exemplars are not theoretical concepts; they are functioning enterprises focused on using biogenic materials such as wood and straw to deliver high-performance, low-carbon homes today, thereby providing a blueprint for national strategies.

EXEMPLAR 1:

Tai ar y Cyd – a new model for social housing delivery

Tai ar y Cyd is a collaboration of 25 Welsh Social landlords. They have co-designed with contractors and supply chain a Pattern Book, Performance Specification and Design Guide to build the next generation of high performing, timber based offsite manufactured affordable homes.

The Tai ar y Cyd project is a unique Welsh collaboration among 25 social landlords to standardise the design and delivery of high-performance, timber-based affordable homes designed to maximise the opportunity to the local timber value chain. Adopting this approach, Tai ar y Cyd provides clear evidence of how intentional sourcing and material specification can dramatically amplify the carbon removal benefits of construction.

It is UK Government policy that wood in construction can only be considered a GGR for UK reporting purposes if it is sourced from a UK forest and has a predicted service life of more than 35 years. For the background to these important requirements please refer to our main GGR report cited earlier. However, in the voluntary carbon markets and under the EUs Carbon Removals and Carbon Farming Framework the origin of the stored biogenic carbon is not a consideration. This report refers to biogenic stored carbon from imported and home-grown timber that has a service life of over 35 years as tradable stored biogenic carbon. However, to enable the quantification of the GGR potential of social housing it is essential to understand how the wood is used within buildings – the product types, the construction elements, the technical grades as well as the provenance (where the trees were grown).

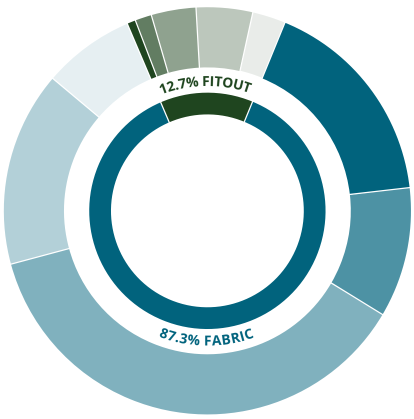
For this exemplar, sample figures for stored and embodied carbon have been obtained by modelling individual timber elements of both fabric and fit-out in a 3D CAD design software. Assigning materials and categories based on function, the quantities have been extracted from the schedules of the BIM model and incorporated into an Excel model that has been created for the purpose of quantifying the stored biogenic carbon. The model allows for further scenario and sensitivity analyses of key variables such as timber provenance, technical grade and product service life.

EXEMPLAR 1:

Tai ar y Cyd – a new model for social housing delivery

Table 1 shows that almost 16 tonnes of wood is contained in a standard detached 5-person, 3-bedroom two storey home designed using the Tai ar y Cyd pattern book[2] and AECB CarbonLite performance specification. This home has an internal floor area of 95.72m². The quantities shown in Table 1 assumes that where wood can be used it is being used. That means that wood is used not just in the timber frame and fitout, but also for windows and doors, insulation and the rain screen – which is rarely the case for the majority of timber frame social housing projects. It is important to note that nearly 90% of the wood is used in the fabric of the building with the remainder required for fitout.

Table 1: Quantities of timber in a timber rich Tai ar y Cyd home (5P3B)



Element	Weight (Kg)	Quantity of wood[1] (%)	
Roof[*2]	2,699	17.0%	
First Floor[*2]	1,628	10.3%	
External Walls[*2]	5,907	37.3%	
Cladding	2,444	15.4%	
Internal Walls	1,163	7.3%	87.3% Fabric
Stairs	113	0.7%	
Windows	206	1.3%	
Doors	574	3.6%	
Internal Joinery	714	4.5%	
Kitchen	407	2.6%	12.7% Fitout
	15,854 (127kg/m² GIFA)		

[*1] The quantities shown are wood in a Tai ar y Cyd home as built and not the quantity of wood needed to manufacture a home, which will be higher as some wastage is inevitable.
[*2] The roof, first floor and external walls all contain wood fibre insulation.

The wood requirement can be broken down by wood product as shown in Table 2.

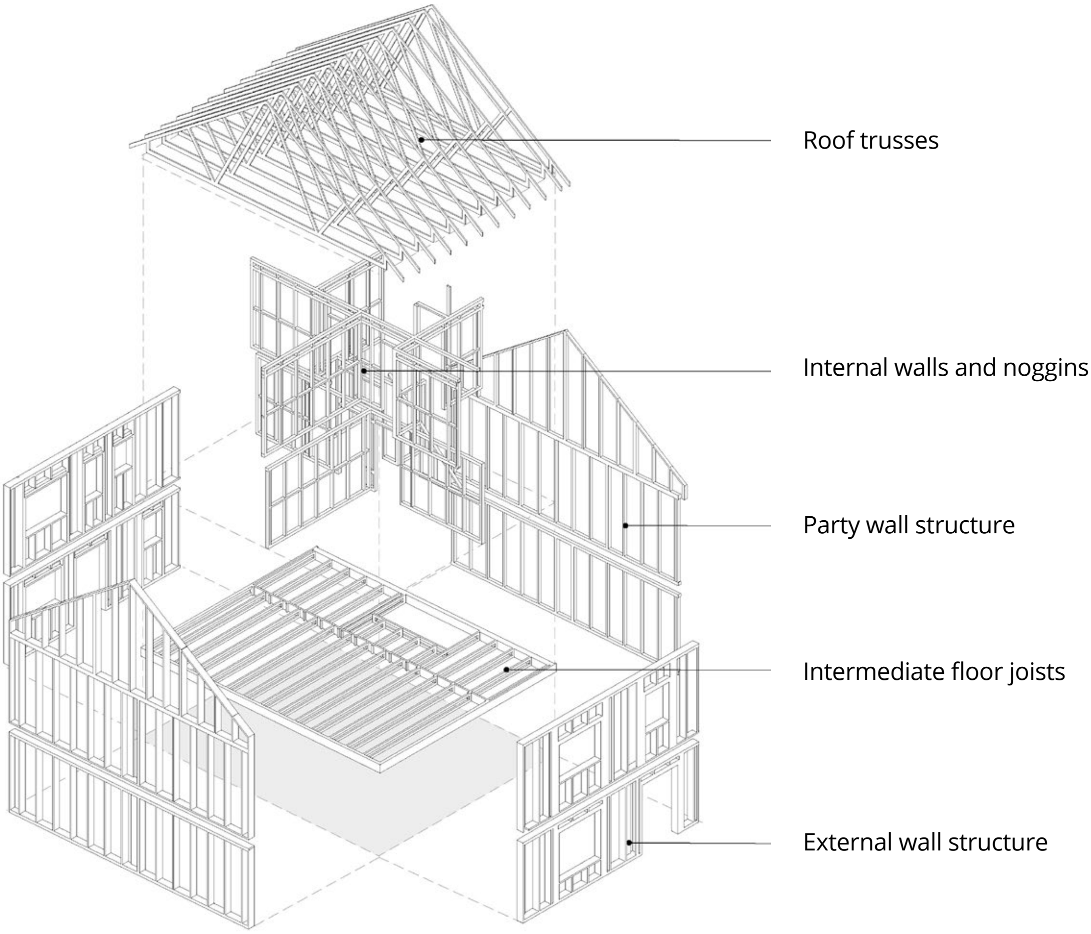
Table 2: Wood products used in a Tai ar y Cyd home (5P3B)

Wood Product	Quantity of wood used	
	Weight (Kg)	%
Structural sawnwood	5,259	33.2%
Non-structural sawnwood	3,050	19.2%
Joinery	356	2.2%
Wood-based panel	3,934	24.8%
Wood fibre insulation	3,206	20.2%
	15,854	

[2] The Tai ar y Cyd pattern book is not currently freely available

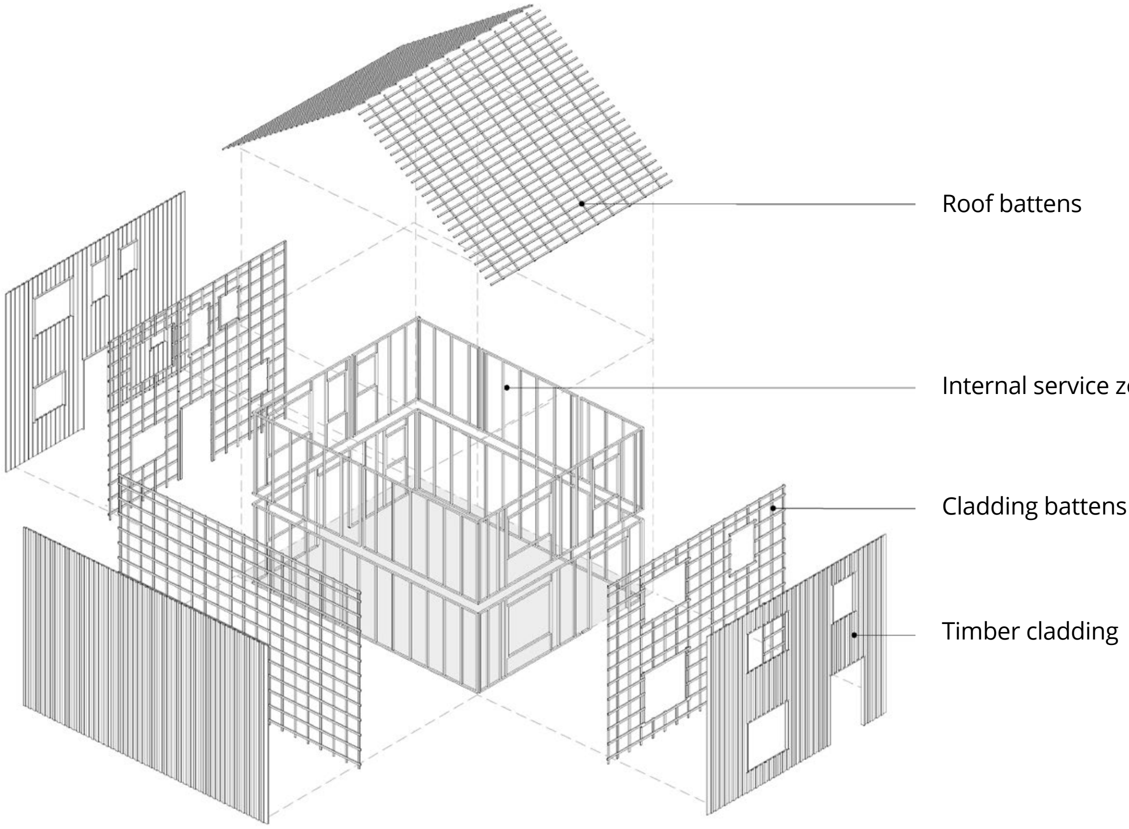
EXEMPLAR 1:
Tai ar y Cyd – a new model for social housing delivery

Structural sawnwood is the largest component made to structural grades C16 or C24, and TR26 (used for trussed rafters and metal web floor joists).



EXEMPLAR 1:
Tai ar y Cyd – a new model for social housing delivery

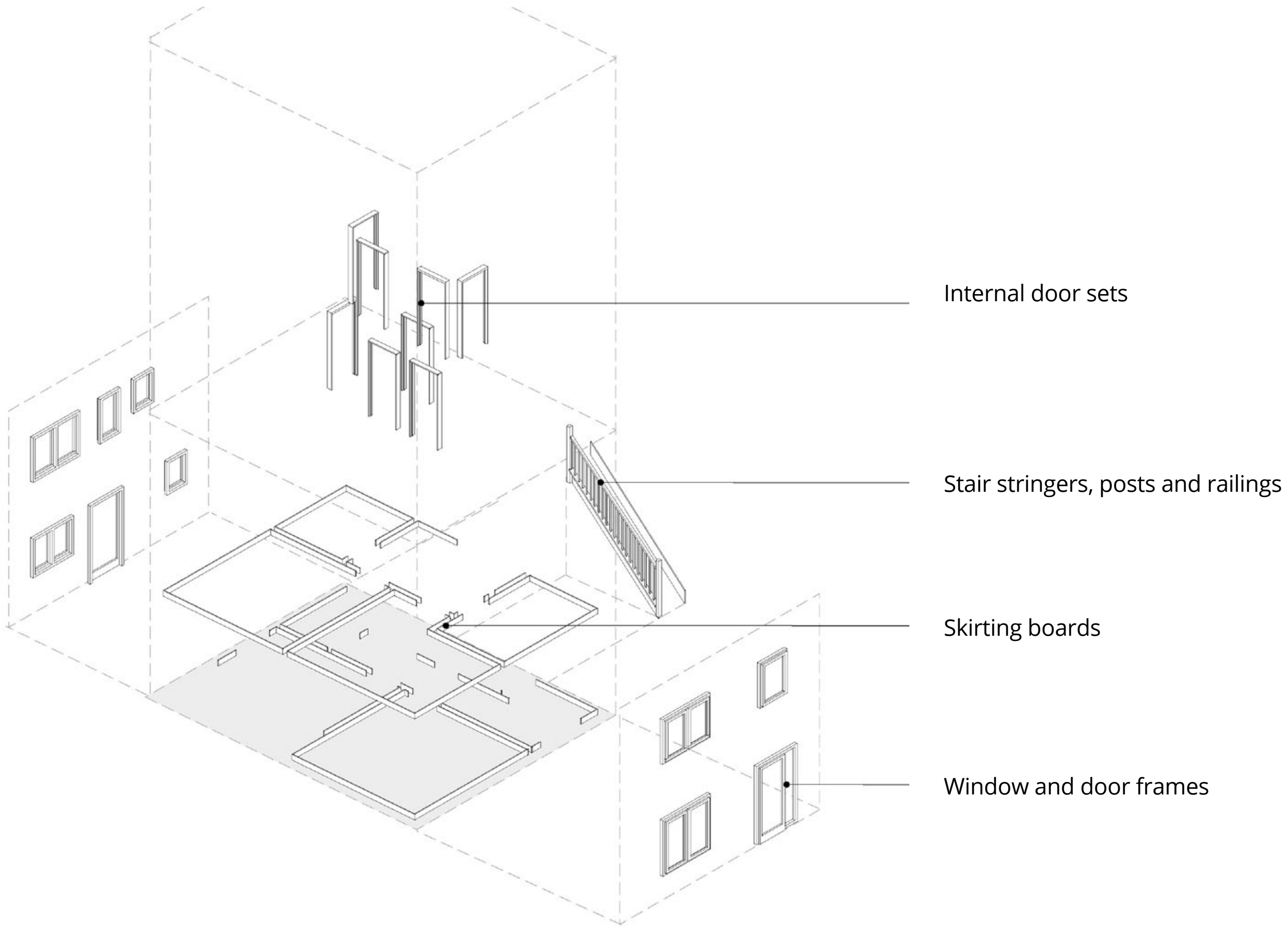
Non-structural sawnwood: Mainly battens and cladding, is readily available from UK sawmills processing home-grown timber.



EXEMPLAR 1:

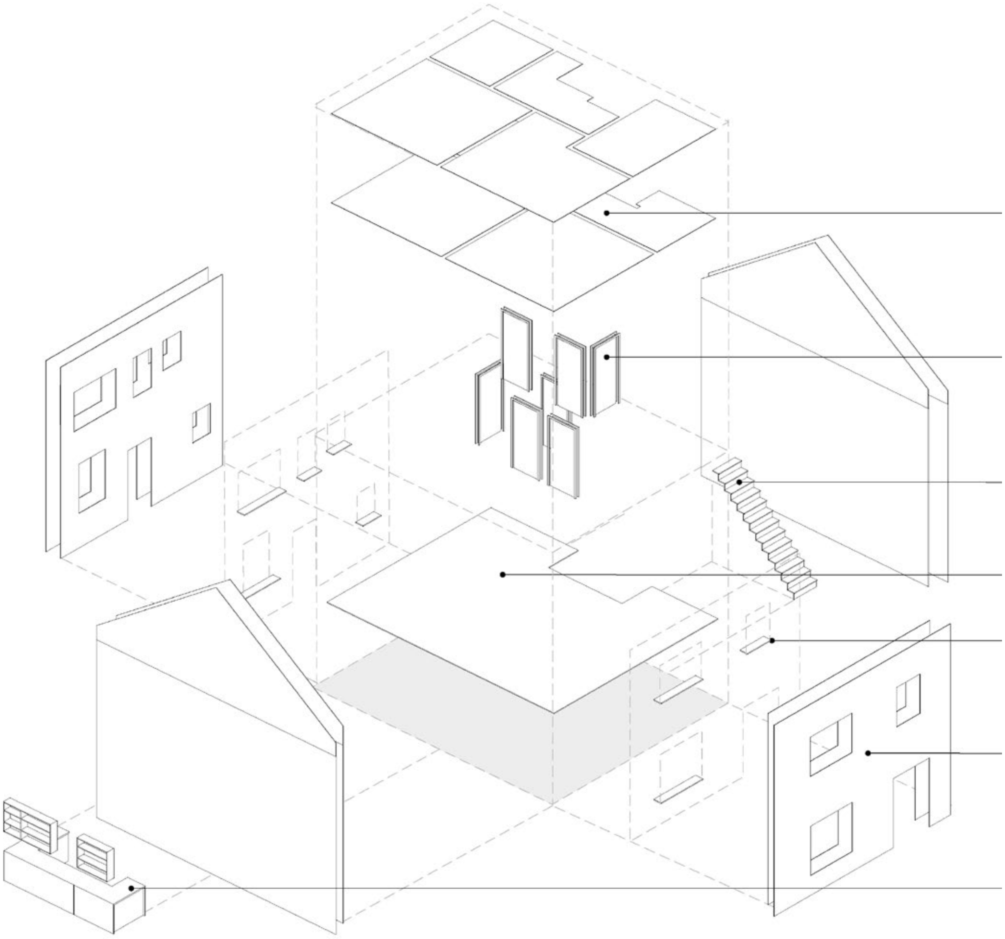
Tai ar y Cyd – a new model for social housing delivery

Joinery timber is assumed to be all imported. This high value but low volume timber is readily available in the UK forest resource but is rarely selected, processed and marketed for joinery applications.



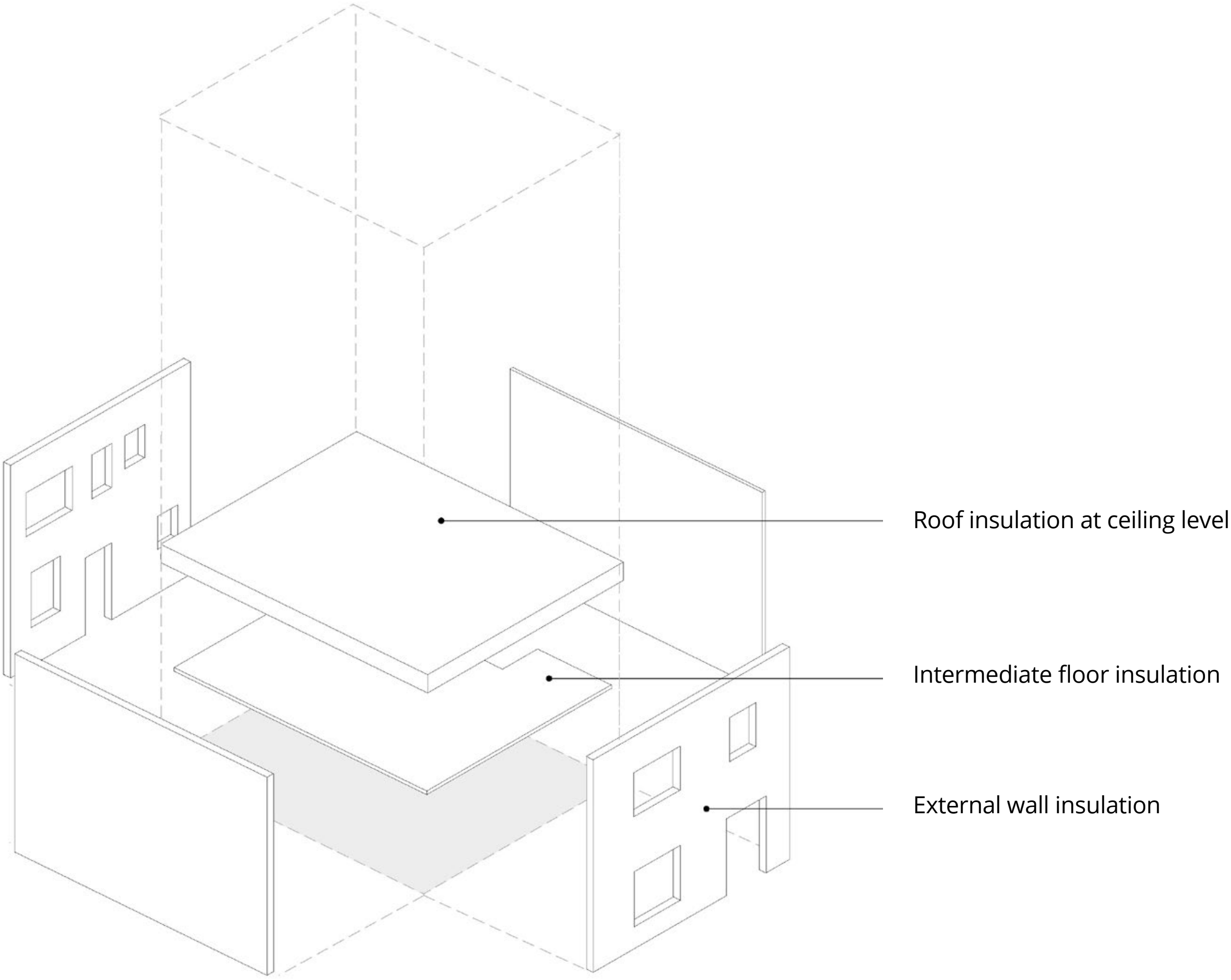
EXEMPLAR 1:
Tai ar y Cyd – a new model for social housing delivery

Wood-based panels: Oriented Strand Board (OSB) for racking resistance, chipboard flooring and kitchens and Medium Density Fibreboard (MDF) for joinery elements are readily available from UK manufacturers of wood-based panels using either UK grown timber or recycled wood (in the case of chipboard).



EXEMPLAR 1:
Tai ar y Cyd – a new model for social housing delivery

Wood fibre insulation is currently imported from manufacturers based in continental Europe, but UK manufacturing is currently being explored[3].



[3] See WkW Wood fibre Insulation Manufacturing feasibility study (available upon request)

EXEMPLAR 1:
Tai ar y Cyd – a new model for social housing delivery

Drilling down into the graded timber component reveals that over 80% of the structural sawnwood needed for a Tai ar y Cyd home is the C16 structural grade which, unlike C24 and TR26, can be readily sourced from the UK forest resource.

Table 3: Grade of structural timber in a Tai ar y Cyd home

Structural Sawnwood	Quantity of wood used	
	Weight (Kg)	%
Grade C16 (UK)*1	4,348	82.7%
Grade TR26 (Imported)*2	911	17.3%
	5,259	

*1 Imported C24 is often used in timber frame construction but C16 can be used without compromising the structural performance of the frame.
*2 TR26 is used for the manufacture of roof trusses and open web floor joists

C16 structural sawnwood grade is readily produced from the UK forest resource and is used in the internal and external walls of timber frame homes. However, imported C24 is often the sawnwood of choice for timber frame construction. C24 is difficult to produce cost effectively from the UK resource.

TR26 structural sawnwood grade is specifically produced for trussed rafter production and is largely knot free. TR26 sawnwood is currently imported and is difficult to produce cost effectively from the UK resource.

EXEMPLAR 1:
Quantifying the GGR

Trees remove carbon dioxide from the air as they grow. Through photosynthesis, a tree takes in carbon dioxide and uses the carbon to build its wood. That means the carbon stored in wood originally came from the atmosphere. When wood is dry, about half of its weight is carbon. Carbon accounting then asks: how much carbon dioxide does that amount of carbon represent? A molecule of carbon dioxide is heavier than the carbon alone, because it also includes oxygen. By weight, carbon dioxide is 3.67 times heavier than carbon.

Putting this together, each kilogram of dry wood contains roughly half a kilogram of carbon, and that carbon corresponds to about 1.8 kilograms of carbon dioxide taken out of the atmosphere. In simple terms, one tonne of dry wood represents about 1.8 tonnes of carbon dioxide removed from the air. This removal lasts only as long as the wood remains intact. If the wood is burned or allowed to decay, the stored carbon is released back into the atmosphere as carbon dioxide.

There are two main complications associated with treating the use of wood in construction as a GGR. These are country of origin (where the trees are grown) and the storage duration or what's known as the reference service life of a building element.

Only home-grown timber can be considered a GGR for the purposes of quantifying UK's contribution to our legally binding net zero commitments. This should not be confused with the potential for the future trading of stored carbon which may not require the country of origin of the timber to be the same as the country of use.

Table 4 shows the origin of timber used in a Tai ar y Cyd home and assumes that home-grown timber is favoured over imported wood when suitable supplies are readily available. However, in the absence of policy incentives, a house manufacturer's purchasing decisions are more likely to be influenced by factors such as price, quality and trading terms, which often lead to a preference for imported timber.

Table 4: Source of timber in a Tai ar y Cyd House (5P3B)

Wood source	Quantity of wood used	
	Weight (Kg)	%
Home-grown	5,522	34.8%
Imported	8,820	55.6%
Recycled	1,512	9.5%
	15,854	

Home-grown timber quantities assume that the timber frame is manufactured from C16 sourced from the UK forest, as well as non-structural sawnwood elements such as battens and cladding, the wood-based panels such as the OSB racking board and MDF used for some internal joinery items such as skirtings, architraves, stairs and window boards.

Imported timber quantities assume that the trussed rafters and floor joists are manufactured from the TR26 sawnwood grade which is not currently available from UK sawmills. Wood fibre insulation, the softwood joinery elements (e.g. windows, doorsets and stairs) are not currently available from home-grown timber.

Recycled timber quantities assume that chipboard from Kronospan is used for flooring and fitted kitchens. Kronospan's chipboard products are now made almost entirely from recycled wood.

EXEMPLAR 1:
Quantifying the GGR

A further important consideration is that the EU's Carbon Removal and Carbon Farming Certification Framework uses 35 years as the minimum storage period for carbon in wood used in construction to qualify as a biogenic carbon removal. This is because the framework is deliberately designed to balance environmental integrity with realistic product lifetimes and monitoring feasibility. This generally means that only biogenic carbon stored in the fabric of homes can be considered a GGR for both national reporting and trading purposes. For a timber rich timber frame home built to the Tai ar y Cyd specification, almost 90% of the total carbon storage is in the fabric of the home (See Table 1).

ISO 15686-8:2008 provides guidance on the methods for estimating of service-life of construction elements. Currently, the most useful resource for supporting service life assumptions of building elements in the UK is the RICS Whole Life Carbon Assessment for the Built Environment[4]. However, the methodologies allow for different service lives to be assumed provided suitable evidence can be provided. The RICS service lives and the service lives used in the Tai ar y Cyd biogenic stored carbon model are shown in the Table 5.

Table 5: RICS reference service lives and service lives used in the Tai ar y Cyd model

Element	RICS Service life	Tai ar y Cyd model assumptions
Roof	60 years	60 years
First Floor	60 years	60 years
External Walls	60 years	60 years
Cladding	30 years	>35 years*1
Internal Walls	30 years	60 years*2
Stairs	Not shown	60 years
Windows	30 years	30 years
Doors	20 years	30 years
Internal Joinery	Not listed	20 years
Kitchen	10 years	10 years

*1 Further evidence may be required to create confidence that timber cladding will have a reference service life of more than 35 years.

*2 Further evidence may be required to create confidence that internal walls will have a service life of more than 35 years

The model applies the service life data and wood source assumption to the Tai ar y Cyd quantity data to calculate the GGR. Three difference scenarios have been modelled alongside two counterfactuals.

[4] RICS Whole Life Carbon Assessment for the Built Environment

EXEMPLAR 1:
Quantifying the GGR

Scenario 1: The Wood First scenario referenced in this report so far, is based upon the assumption that wood is used where possible (e.g. in insulation, windows and doors) and that home grown timber is used where it is readily available and of a suitable quality.

Scenario 2: The Home-Grown Wood First scenario assumes the same conditions as Scenario 1 with the additional incentive to favour home-grown timber where practical.

Scenario 3: The + Wood Fibre Insulation (WFI) Manufacturing assumes the same conditions as Scenarios 1 & 2, but with the onshoring of manufacturing of wood fibre insulation. In all three scenarios it is assumed that joinery grade timber is imported.

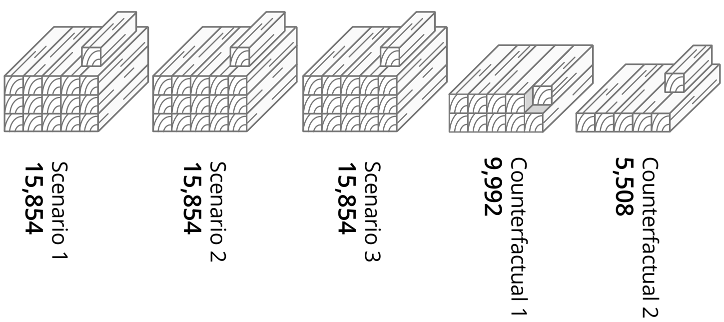
Tai ar y Cyd scenarios 1,2 and 3 are collectively referred to as timber rich timber frame construction in this report

Scenario 4: Counterfactual 1 assumes modern timber frame but without the commitment to other wood-based elements such as insulation, windows and the rain screen cladding. This is the counterfactual that applies most directly to the majority of conventional modern timber frame homes built in the UK.

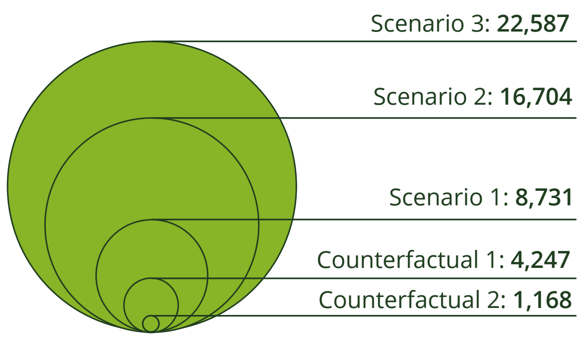
Scenario 5: Counterfactual 2 assumes conventional masonry construction.

Table 6	Total timber	Total home-grown timber	Total carbon storage	Total tradable wood in construction (storage >35 ys)	Total wood in construction GGR (Storage >35 years & home-grown)	
	kg/home	kg/home	$kgCO_2$/home	$kgCO_2$/home	kg/home	$kgCO_2/m^2$
Scenario 1 (Wood first)	15,854	522	29,092	25,604	8,731	91
Scenario 2 (Home-grown wood first)	15,854	9,867	29,092	25,604	16,704	175
Scenario 3 (Home-grown wood first + WFI manufacturing)	15,854	13,073	29,092	25,604	22,587	236
Counterfactual 1 (Modern timber frame)	9,992	3,078	18,336	15,236	4,247	44
Counterfactual 2 (Masonry construction)	5,508	1,400	10,107	7,007	1,168	12

Timber total



GGR total



EXEMPLAR 1:
Quantifying the GGR

The data reveals a compelling narrative.

- The total amount of wood used in a Tai ar y Cyd home (Scenarios 1,2 & 3) of 15,854 $kgCO_2$/home is 50% more than that of a standard timber frame in Counterfactual 1, and 3 times that of an equivalent masonry (brick and block) home (Counterfactual 2). This presents a significant economic opportunity for the forestry and timber construction sector

- The timber rich Tai ar y Cyd house (Scenarios 1,2 & 3) contains 3 times the quantity of wood as an equivalent brick and block house (Counterfactual 2) but almost 20 times the GGR potential presenting a compelling reason for policy makers to incentivise timber rich construction.

- The tradable carbon storage potential of a Tai ar y Cyd timber frame home in Scenarios 1, 2 & 3 is 25,604 $kgCO_2$/home which is 68% higher than that of a standard timber frame (Counterfactual 1) and over 3.7 times higher than that of an equivalent brick and block home (Counterfactual 2). There is a compelling opportunity for developers to monetise this stored carbon as will be shown in Example 2 – Agile Homes later in this report.

- The GGR potential of a Tai ar y Cyd home where there is a focus on the use of home-grown timber (Scenario 2) of 16,704 $kgCO_2$/home is approximately twice that when there is no particular emphasis on using home-grown timber (Scenario 1). Put another way, an incentive for using home-grown timber would provide a GGR benefit of an additional £400/home to the treasury (at a carbon price of £50/tonne). This is based upon the carbon value alone, providing no additional value associated with the social and economic benefits.

- The GGR potential of a Tai ar y Cyd home where there is focus on home-grown timber and the UK manufacturing of timber components (Scenario 3) of 22,587 $kgCO_2$ homes creates approximately 20 times the GGR benefit of brick and block construction (Counterfactual 2) and over 5 times that of a standard timber frame home (Counterfactual 1). If we were to establish a wood fibre insulation facility in the UK, this would provide a GGR benefit worth approximately £300/home[5] to the UK treasury, creating a financial reason to incentivise UK production.

This data provides an undeniable policy lesson: targeted incentives and public procurement standards that favour timber construction, encourage home-grown and local supplies and support the establishment timber products manufacturing, can yield a significantly carbon removal benefit for every home built. Such incentives would strengthen donestic supply chains and maximise the climate return on public investment. At the same time strengthening domestic supply chains and maximising the climate return on public investment.

[5] Calculated from Table 6: GGR Scenario 3 – GGR Scenario 2, multiplied by the price of carbon of £50/tonne

EXEMPLAR 2:
Agile Homes - A Model for Social Value and Carbon Monetisation

Agile Homes is an innovator focused on a new housing delivery model that integrates profound social impact, off-site manufacturing with biogenic materials like timber and straw, and novel financing mechanisms. The company demonstrates that carbon storage can be a catalyst for wider economic and social regeneration. Agile's key operational and strategic differentiators include:

Social Capital Creation: Agile's "Prisoners Building Homes" program is a powerful example of social return on investment. The program has successfully graduated over 100 men from HMP programme and has been shown to reduce reoffending by up to 96%.

Financial Innovation: Agile has secured a £500m institutional funding mandate from Aether for specialised and temporary accommodation and is engaged directly with Homes England for national scaling. This demonstrates growing institutional confidence in its delivery model.

Carbon & Social Value Trading (CSVT): Crucially, Agile has developed a platform to tokenise and monetise both the carbon stored in its buildings and the social value they create. In a landmark achievement, the company has already conducted the first UK trade of stored biogenic carbon, proving that a market can be created. This trade has been conducted before the reporting and verification infrastructure has been created. Agile is now collaborating with Grown in Britain to help establish the required governance infrastructure to make stored carbon trades more robust. It should be noted that woodland carbon was traded before the creation of the Woodland Carbon Code.

Agile's straw and timber system stores a substantial 729 kg/CO_2/m^2. This is significantly higher than Tai ar y Cyd of 231kgCO_2/m^2 but may in part be explained by the fact that the Agile system from which this number was extracted contains a timber ground floor and was based upon a bungalow. Single storey buildings require more material to create a floor area equivalent to a 2-storey building.

EXEMPLAR 3:
MAKAR - Two Decades of Scalable Net-Zero Delivery

MAKAR stands as proof of the long-term commercial viability of high-performance timber rich offsite timber construction systems, having successfully deployed its operations in Scotland since 2002. In contrast to the innovative business models of Agile or the collaborative public procurement of Tai ar y Cyd, MAKAR represents an established, durable, and replicable private-sector enterprise.

As a design-led manufacturing and construction company, MAKAR has delivered over 250 net-zero buildings. Its success is built on a vertically integrated model that uses locally sourced Scottish timber within an advanced off-site manufacturing process. This approach ensures quality control, efficiency, and a low-carbon supply chain. MAKAR's diverse product offering – spanning affordable terrace homes, custom self-builds, and large commercial and community buildings – proves the versatility and maturity of its system. MAKAR's two decades of operation serve as tangible proof that a regional, timber-focused construction economy can be scaled successfully, providing an enduring model for other UK regions to follow.

The quantity of timber contained within the fabric of a MAKAR home is shown in the Table 7 below.

Table 7: Timber quantities in a MAKAR social home (92.45m²)

Product	Species	Element	Volume (m^3)	Dry Density (kg/m^3)	Carbon Storage $KgCO_2$
Sawnwood	Larch	Cladding	6.53	650	7,789
Sawnwood	Spruce	Structure	16.72	450	13,807
OSB	Spruce	Structure	7.03	650	8,385
Glulam	Spruce	Structure	1.82	500	1,670
Wood Fibre Insulation	Spruce	Fabric	13.07	150	3,598
Warmcell	Cellulose	Fabric	27.00	75	3,716
				TOTAL (per house)	**38,963**
				TOTAL (per m²)	**421**

EXEMPLARS:
IN SUMMARY

The tradable biogenic stored carbon component of the three exemplars is shown in Table 8. To help comparison between the three exemplars the focus is upon (1) the tradable stored carbon component rather than GGR as in the case of MAKAR the wood fibre insulation component is imported and (2) on the tradable biogenic stored carbon per m^2 rather than per home for ease of comparison.

The stored carbon in the AGILE home is higher than MAKAR and Tai ar y Cyd in part because it's a bungalow (which require more fabric for a given floor area than 2-storey homes) and in part because unlike MAKAR and Tai ar y Cyd, it has a timber ground floor.

The stored carbon for the MAKAR home is significantly higher than for a Tai ar Y Cyd home. This is due to the large dimension solid timbers used for MAKAR's closed panel construction system.

Table 8

Construction System	Type	Internal floor area (m^2)	Tradable stored carbon in the fabric ($kgCO_2/m^2$)
Masonry	2-storey (5P3B)	95.72	12
Standard timber frame	2-storey (5P3B)	95.72	44
Tai ar y Cyd	2-storey (5P3B)	95.72	267
AGILE	Bungalow	37	729
MAKAR	2-storey (4P2B)	92.45	421

In summary, whilst these three biogenic exemplars are not directly comparable, they all showcase the potential for public housing to help UK Government to meet legally binding carbon targets.

While these individual exemplars are powerful, building a robust national market requires the following key features.
(1) The development of standardised, credible, and universally accepted verification systems. Such a system is currently being created by Grown in Britain.
(2) Policy incentives: It is notable that the Department for Education are proposing to include a biogenic carbon storage requirement of 20 $kg/CO_2/m^2$ in their new specification[6]. This does not appear to be a hugely demanding target but may well be sufficient to influence procurement decisions and sets an important policy precedent.

[6] Innovare Offsite. The Department for Education 2025 Construction Framework

BUILDING THE MARKET:

The Infrastructure for Carbon Verification and Trading

The strategic development of a trustworthy market infrastructure for biogenic carbon is essential. Without robust monitoring, reporting, and verification, the value of carbon stored in buildings cannot be reliably monetised, which in turn hinders private investment and undermines policy effectiveness. A groundbreaking initiative led by Grown in Britain is directly addressing this critical gap. A major industry coalition is developing the Biogenic Stored Carbon Quotient (BSCQ) certification, a pivotal piece of market infrastructure designed to build confidence and unlock investment in timber construction as a carbon removal solution. The core functions and goals of the BSCQ scheme are described below.

Purpose: To provide the first comprehensive UK certification to quantify and verify stored biogenic carbon and associated social value in the built environment.

Key Partners: The initiative's credibility is reinforced by its sector-wide coalition, which includes tier-one contractors, the Forestry Commission, Timber Development UK, Bangor University, and the Welsh and Scottish governments.

Core Functions: The scheme will establish a robust framework for monitoring, reporting, and verifying (MRV) the GGR potential of timber buildings. This will address concerns about greenwashing, build market confidence, and provide reliable data for corporate ESG reporting and national inventories.

Market Impact: The BSCQ will enable stored carbon credits to be formally monetised. This will create a powerful financial incentive, driving investment into sustainable forestry, strengthening domestic supply chains, and accelerating the use of biogenic materials in construction. Agile Homes' landmark transaction has proven the existence of a viable market for stored biogenic carbon credits. The BSCQ infrastructure is the crucial next step, providing the standardised, credible framework needed to scale this nascent market from a pioneering transaction into a national asset class. With proven delivery models in place and the essential market infrastructure now emerging, the path is clear for targeted policy to accelerate this critical transition.

BUILDING THE MARKET:

The Infrastructure for Carbon Verification and Trading

Conclusion and Policy Recommendations

The evidence presented in this report is clear: high-performance timber construction is not a future concept but a present-day reality. The exemplars – Tai ar y Cyd, Agile Homes, and MAKAR – demonstrate that the technology, business models, and supply chains exist to deliver low-carbon, carbon-storing homes at scale. The concurrent development of robust verification frameworks like the Biogenic Stored Carbon Quotient (BSCQ) is creating the conditions for a credible and scalable carbon removal market centered on the built environment.

The UK is now positioned to align its housing, economic, and climate objectives through decisive policy action. Based on the evidence from these pioneers and the principles outlined in supporting research, the following actions are recommended:

Mandate Timber in Public Procurement
Require government-funded projects, including social housing, schools, and public offices, to use a minimum percentage of timber and other biogenic materials. This creates a stable, long-term demand signal that de-risks private investment in domestic manufacturing. As the Tai ar y Cyd project proves, public procurement standards for social housing can directly drive the use of high-GGR, home-grown systems, maximisng the climate return on public investment.

Establish a National Inventory for Wood in Construction (WIC)
Create a formal national inventory to track the quantity of carbon stored in the UK's building stock. A national inventory is essential for accurate climate reporting under IPCC Tier 3 guidelines, preventing double-counting, and providing policymakers with reliable data to measure progress and refine GGR strategy.

Provide Financial Incentives for Verified Carbon Storage
Introduce targeted financial incentives, such as tax deductions, lower VAT rates, or direct subsidies, for buildings that can demonstrate high levels of verified, long-term carbon storage. The forthcoming BSCQ provides the exact mechanism needed to verify carbon storage claims and prevent greenwashing, making such incentives viable and defensible. This will directly reward developers for delivering a public good (carbon removal) and accelerate market adoption.

Fund Domestic Manufacturing and Innovation
Offer capital grants and other financial support for the establishment and expansion of UK-based facilities producing engineered wood products like Cross-Laminated Timber (CLT), glulam, and wood fibre insulation. The Tai ar y Cyd data quantifies the GGR dividend of prioritising a UK supply chain, which results in a nearly 270% increase in verifiable GGR from UK sources. Strengthening the home-grown supply chain is critical for national resilience, reducing import reliance, and creating skilled green jobs.

De-risk Timber Construction through Insurance Reform
Government should work with the insurance industry to address barriers to insuring innovative timber projects, potentially by underwriting a degree of risk in a manner similar to the FloodRE scheme for properties in flood-risk areas. Perceived risk and resulting high insurance premiums remain a significant barrier to adopting mass timber systems. A government-backed scheme would provide the confidence needed for the insurance industry to adapt to these proven and safe construction methods.

The choice facing policymakers is no longer whether to support this sector, but how quickly and decisively we can act to secure its benefits. The technology is proven, the business models are scaling, and the opportunity to build a nationally significant Greenhouse Gas Removal mechanism that also addresses our urgent need for housing is here.

APPENDIX: Quantities of wood in a Tai ar y Cyd semi-detached house (5P3B)

House type size: 95.72 m² (GIFA) | Sawnwood and joinery timber density: 500 kg/m³ | Chipboard & OSB density: 650 kg/m³
MDF density: 850 kg/m³ | Plywood density: 700 kg/m³ | Wood fibre insulation (loose fill): 65 kg/m³
Wood fibre insulation (flexible batts): 55 kg/m³ | Carbon content of wood: 50% | Conversion of carbon to CO_2: 3.67

Element	Product	Grade	Volume (m³)	Weight (kg)	Carbon Storage ($kgCO_2$)
Roof	Roof trusses	Structural sawnwood (TR26)	1.145	573	1051
	Roof battens	Non-structural sawnwood	0.456	228	418
	Roof insulation	Wood fibre insulation (batts)	28.070	1544	2833
	Airtighness layer	Wood-based panel (OSB)	0.545	354	650
				2699	**4952** Sub-total
Floor	Posi joists	Strutural sawnwood (TR26)	0.682	341	626
	Trimmers	Structural sawnwood	0.235	118	216
	Rim Board	Structural sawnwood	0.516	258	473
	Deck	Wood-based panel (chipboard)	1.033	671	1232
	Insulation	Wood fibre insulation (batts)	4.357	240	440
				1628	**2987** Sub-total
External walls	Studs	Structural sawnwood (C16)	3.497	1749	3208
	Base rails	Structural sawnwood (C16)	0.181	91	166
	Sole Plate	Structural sawnwood (C16)	0.181	91	166
	Top Rails	Structural sawnwood (C16)	1.598	799	1466
	Service Void	Non-structural sawnwood	0.756	378	694
	Insulation Walls	Wood fibre insulation (loose)	21.035	1367	2509
	Insulation Service Void	Wood fibre insulation (batts)	3.724	55	101
	Lintels	Structural sawnwood	0.156	78	143
	Airtightness Layer	Wood-based panel (OSB)	1.628	650	1193
	Sheathing board	Wood-based panel (OSB)	1.507	650	1193
				5907	**10839** Sub-total
Windows	Window Frames	Joinery sawnwood	0.312	156	156
	Window boards	Wood-based panel (MDF)	0.059	50	50
				206	**378** sub-total
Internal walls	Studs	Structural sawnwood (C16)	1.311	656	1203
	Base Rail	Structural sawnwood (C16)	0.344	172	316
	Top Rail	Structural sawnwood (C16)	0.419	210	384
	Noggins	Structural sawnwood (C16)	0.252	126	231
				1163	**2134** Sub-total
Doors	Internal door stop	Joinery sawnwood	0.018	9	16
	Internal Door set	Joinery sawnwood	0.151	76	139
	Doors internal	Wood-based panel (chipboard)	0.667	434	796
	Doors external	Joinery sawnwood	0.045	23	41
	Door frame external	Joinery sawnwood	0.067	34	61
				574	**1054** Sub-total
Internal joinery	Skirting Boards	Wood-based panel (MDF)	0.240	120	220
	Architraves	Wood-based panel (MDF)	0.086	43	79
	Floor finish	Wood-based panel (MDF)	0.847	551	1010
				714	**1310** Sub-total
Stairs	Goings	Wood-based panel (MDF)	0.057	29	52
	Risers	Wood-based panel (MDF)	0.051	26	47
	Strings	Joinery sawnwood	0.048	24	44
	Handrail	Joinery sawnwood	0.011	6	10
	Base rail	Joinery sawnwood	0.013	7	12
	Posts	Joinery sawnwood	0.025	13	23
	Spindles	Joinery sawnwood	0.021	11	19
				113	**207** Sub-total
Kitchen	Cabinetry	Wood-based panel (chipboard)	0.494	321	589
	Worktop	Wood-based panel (chipboard)	0.132	86	157
				407	**747** Sub-total
Cladding	Cladding boards	Non-structural sawnwood	3.417	2050	3762
	Battens	Non-structural sawnwood	0.676	338	620
	Window Surrounds	Non-structural sawnwood	0.093	56	102
				2444	**4485** Sub-total
				15,854	**29,092** Grand total

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