

Home-Grown Homes Project
A study for improving the
Timber Construction Supply Industry in Wales

Interim Report – October 2019

Led by Powys County Council
Funded through the Rural Development Programme

Delivered by Woodknowledge Wales
in partnership with Cardiff Metropolitan University,
Coed Cymru and BM TRADA



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EXECUTIVE SUMMARY

The project *A 33-month research study to design and test out interventions that could substantially improve the timber construction supply chain in Wales*

The partners *Led by Powys County Council, funded by Welsh Government and the EU Rural Development Programme and delivered by Woodknowledge Wales in partnership with Cardiff Metropolitan University, Coed Cymru and BM TRADA*

The sectors *Aiming to influence three sectors that have impact on the timber construction supply chain – that is social housing, timber manufacturing and forest industries*

The research method *A combination of applied research, knowledge exchange and strategic engagement with social housing projects under development in Wales*

The main deliverable *A report for Welsh Government identifying which supply chain interventions may be most effective and how they might be applied*

Other deliverables will include:

Case studies *That demonstrate supply chain barriers and opportunities*

Building performance guidance *On building performance evaluation methods and how they can be applied to improve the energy, health, comfort, usability and carbon performance of homes*

Whole-life Carbon guidance *On the benefit of whole life carbon assessment and how to do it*

A standard timber frame specification *An industry co-created standard specification for timber frame combined with a quality assurance process validated through building performance evaluation*

Specification tools *Client focused and created for timber windows, cladding and wood fibre insulation*

The present timber supply chain *From forest area and log supply to the source, specification, quality and quantity of structural, construction and joinery grade timber*

Potential future timber supply chain *The details and characteristics of the future timber supply chain required to meet potential future demand in construction*

A zero-carbon solution *An open-source, high-performance, low-carbon building solution for social housing*

Education resource *Under consideration*

1. Introduction

The Home-Grown Homes Project was launched in April 2018 and is a 33-month timber supply chain development research study. The project is led by Powys County Council, funded by Welsh Government and the EU Rural Development Programme and being delivered by Woodknowledge Wales with Cardiff Metropolitan University, Coed Cymru and BM TRADA.

The purpose of the project is to identify and test out interventions that, if applied, could have a transformative impact on the Welsh timber construction supply chain in particular and on the delivery of low carbon social housing in general.

The project is focused on three discrete but overlapping sectors of Welsh society that have a profound impact on the timber construction supply chain; that is housing, timber manufacturing and forest industries.

Overall it is expected that this project will significantly enhance the social, environmental and economic case for the development of the timber construction supply chain in Wales.

The main deliverable is a report for Welsh Government identifying which supply chain interventions may be most effective and how they might be applied through regulation or other means. The project is highly topical as it addresses two priority themes for Welsh Government; that is creating foundational economic growth and delivering a low carbon response to the declared climate emergency.

In addition to the final report, other important outputs will be created that capture the learning from the project activities and are intended to support ongoing market driven development of the housing, timber manufacturing and forestry sectors in Wales. These outputs include

- **Case Studies** to showcase best practice
- Timber element **Design and Specification Tools** to help clients procure timber solutions
- **Industry Guidance** to help building clients deliver better low carbon timber buildings

The project is illustrated in the following project infographic:

THE HOME-GROWN HOMES PROJECT

A STUDY FOR IMPROVING THE TIMBER CONSTRUCTION SUPPLY CHAIN IN WALES

APPLIED RESEARCH • REAL HOUSING PROJECTS • KNOWLEDGE EXCHANGE

BETTER HOMES



To improve the quality of Welsh homes through building performance evaluation & whole life carbon analysis

MORE & BETTER MANUFACTURING



To improve the quality of offsite manufacturing through collaboration, greater systemisation and application of low carbon standards

MORE & BETTER HOME-GROWN TIMBER



To improve the business case for expanding Welsh forestry through stimulating construction timber demand & supply



DEVELOPMENT OF A NET-ZERO HOUSING SOLUTION
IMPROVED CASE FOR FORESTRY AND TIMBER CONSTRUCTION
CASE STUDIES & INDUSTRY GUIDANCE
DESIGN & SPECIFICATION TOOLS
RECOMMENDED SUPPLY CHAIN INTERVENTIONS



A pan-Wales project (April 2018 to December 2020)

Led by **Powys County Council**
Delivered by **Woodknowledge Wales, Cardiff Met, Coed Cymru & TRADA**
Funded through **The Rural Development Programme**



2. Research Methods

The research method is founded upon three main activities:

Applied research to understand the dynamics of the current supply chain and the timber construction industry to help identify potential interventions and how these interventions might be applied to maximum benefit. The research draws upon desk-based investigation (e.g. academic literature, market data, industry websites), structured engagement with the supply chain (e.g. face to face interviews) and consultation with external experts.

Knowledge exchange to inform the development of supply chain interventions and to encourage clients and the timber industry to engage pro-actively in the foundational economic development and low carbon agenda promoted by the project team. The methods used include workshops, conferences, supply chain meetings and site visits with project updates provided through, e-newsletters, social media and the project website. By linking clients with the supply chain, we are able to support learning, dispel myths and better understand the issues that are restricting or preventing the further uptake of wood-based solutions by the social housing sector in Wales.

Strategic engagement with social housing projects under development to identify barriers to the development of the timber supply chain and to test out the effectiveness of interventions to overcome these barriers at the design, construction and post completion phase of projects. The knowledge gained provides crucial information to support the delivery of high-performance low-carbon social homes using timber.

The project has 7 work packages, each with their own tasks, milestones and deliverables:

1. **Project management** to ensure effective delivery and management of the project. It includes regular meeting management and reporting, the achievement of targets, deliverables and production of Key Performance Information as well as project related activity by partners and financial management of the project.
2. **Exemplar construction projects** to identify housing projects that the home-grown home project team can collaborate upon for knowledge exchange, research activities and to inform the content and purpose of project outputs. The housing projects provide the practical basis to explore interventions identified in work packages 3, 4 and 5.
3. **Housing - Better timber homes** to understand how the performance and sustainability of social housing can be improved through the use of building performance evaluation and whole life carbon assessment, and to address how these methods can be applied (1) within an enhanced quality assurance process, (2) for feedback and learning to inform the better design and delivery of future developments and (3) to inform policy.
4. **Timber manufacturing - Better local manufacturing** to explore how the cost, quality and performance of Welsh manufactured timber components can be improved in terms of the supply into social housing.
5. **Forestry - More and better home-grown timber** to explore how the Welsh timber supply chain can be improved to increase the quantity of Welsh grown timber flowing into the social housing market and to enhance the case for forestry in Wales.

6. **Demonstration** to demonstrate learning from the project through the design of a net-zero carbon whole-life carbon building approach and through the design and delivery of education/communication resources.
7. **Knowledge exchange and dissemination** to ensure the learning created in the project is communicated in a manner designed to have maximum positive impact on the quality of social housing and upon the Welsh timber construction supply chain.

3. Progress to date (end October 2019)

Work Package 1: Project Management:

The Project is on track to deliver its objectives. A Consortium Agreement was signed by the consortium partners and a successful kick-off meeting and launch took place in the summer of 2018. Regular quarterly project consortium meetings have been held since inception where each partner prepares a progress report on their work packages and the risk register and project plan are updated. Regular meetings have also taken place with key work package leads. The project finances are managed so that partner invoices are secured, and claims made from Powys CC on a regular basis. Project progress is reviewed by a Management Board chaired by Powys CC with stakeholder representation which has been reviewed and widened. All of the project documents are kept digitally on a shared cloud-based system. An evaluation of the project was commissioned by Powys CC in Spring 2019.

Proposed project output: the key output from this work package will be a Final Report intended to highlight learning and evidence stakeholder engagement targets and performance against specific KPIs. The report will provide recommendations for future activities and interventions necessary to support the ongoing development of the Welsh timber construction and forest industries sector.

Work Package 2: Exemplar construction projects:

The clients and projects that are actively engaged in collaborating with one or more of the consortium partners in the Project is shown in the following table. This engagement involves exploring and intervening in timber supply chain development (WP5) undertaking design reviews and timber frame analyses and support (WP4), building performance evaluation (WP3) and whole life carbon assessments (WP3).

	Project Name	Location	Client	Homes
1	Chiltern Close	Cardiff	Wales & West	82
2	Clyro	Hay-On-Wye	Powys CC	12
3	Red Dragon	Newtown	Powys CC	18
4	Sarn	Newtown	Powys CC	7
5	Croft Court	Welshpool	Mid-Wales Housing	17
6	Llanbedr	Ruthin	Clwyd Alyn	38
7	Glasdir	Ruthin	Clwyd Alyn	75
8	Llys Hampson	Buckley	Grŵp Cynefin	24
Case Studies 9 to 13 pending further updates as a result of construction delay				
9	Former Bowling Green	Newtown	Powys CC	
10	William Ainge Court	Welshpool	Mid Wales HA	

11	Pennant Hall	Penmaenmawr	Cartrefi Cymunedol Gwynedd	
12	Two Locks	Cwmbran	Bron Afon	
13	Ty Newyddion	Garndiffaith	Bron Afon	

Many barriers to the development of the timber supply chain have been identified through engagement with clients, architects and contractors involved in social housing projects. A few of these are highlighted below. They are being addressed through knowledge exchange and the development of specific tools (detailed in other work packages)

- Negative perceptions about the quality of Welsh timber
- Knowledge barriers to procurement of timber windows and timber cladding
- Additional standards required to meet social housing standards e.g. Secured by Design
- Procurement rules making durable supply chain relationships difficult if not impossible

Proposed project output: The main output from this work package will be case studies demonstrating supply chain barriers (and how they have been overcome) and opportunities (and how they have been realised). Example case studies have been produced on the use of home-grown structural timber on a Clwyd Alyn project in Llanbedr ([here](#)) and a Grŵp Cynefin project in Buckley ([here](#)) and on the use of Welsh joinery timber ([here](#)).

Work Package 3: Housing – Better timber homes

The work undertaken in this work package addresses how to understand, measure and deliver high-quality social housing through a focus on energy, health, comfort, usability and whole life carbon emissions of new build projects.

Building Performance Evaluation (BPE)

The project team has identified interventions and building performance evaluation methods which will be tested for effectiveness and practicality at the design, construction and post completion stages of a project. These interventions have been selected following research and engagement with experts in the Building Performance Network and the Good Homes Alliance and are described below.

1. **Dynamic Thermal modelling** - which uses 3D building geometry, construction materials, environmental and other characteristics, to simulate and evaluate a building's performance, such as expected energy usage and internal environmental parameters. Aimed at achieving better comfort for occupiers the modelling can be used to reduce the performance gap by predicting the behaviour of buildings before they are constructed. Using design and construction details changes can be made to improve building efficiency before and during construction.
2. **Thermal Bridge Analysis** – designed to prevent heat escaping from junctions in the building fabric in order to prevent condensation (which can be problematic for timber construction), save energy and mitigate fuel poverty and associated carbon emissions from unwanted air leakage. Sometimes called a cold bridge, it is a localised weakness or discontinuity in a building's thermal envelope and generally occurs when the insulation layer is interrupted by a more conductive material.

3. **PHPP (Passive House Planning Package)** - this design, quality assurance and certification tool is one of the most powerful tools used in the design of low energy buildings. It encompasses the specific climate where a design is situated, the building geometry, building assembly specifications, the heating, cooling, ventilation, lighting and all other energy uses within the building.
4. **GHA (Good Home Alliance) Guidance to Reduce Overheating Risk** - this tool is intended for use at the early design stage of new housing development in order to identify key factors contributing to overheating risk, and possible mitigation measures.
5. **Diagnostic Airtightness** - an air permeability compliance test is a requirement of the Building Regulations. A diagnostic test can be undertaken to show unwanted air leakage and how to reduce it before the compliance test. Leakage leads to uncontrolled heat loss/gain and can impact upon a building's SAP assessment and EPC rating.
6. **Thermography** - this test can determine potential air leakage, insulation gaps, thermal bridges and moisture within the building fabric which are not visible to the naked eye. It is one method to identify any gaps in thermal performance and unintended consequences of workmanship that need rectifying before completion.
7. **Co-heating and Smart HTC** – a co-heating test identifies the actual performance of the building fabric by assessing the heating loss without the influence of occupants. The project is evaluating the novel addition of calculating the Heat Transfer Coefficient (HTC) by using smart technology and an innovative approach. Smart HTC is a low-cost web service application that combines energy, temperature and weather data to determine the whole fabric performance and produce a heat transfer coefficient: the amount of energy input required for every degree difference between inside and out (W/K). It is a measure of space heating demand and can also be compared with the calculated HTC figure in SAP and other design models to determine design versus as-built performance.
8. **Pulse air permeability measurement system** – this test assesses air leakage in buildings in a fast and low-disruptive manner. It measures building air leakage at ambient pressure levels, in contrast to the more common air tightness test which uses a blower door fan requiring high-pressure and relatively more disruptive monitoring methods. The Pulse test is great for understanding the leakiness of a property as well as its ventilation needs.
9. **Post Occupancy Evaluation** – we plan to use the Building Use Studies (BUS) methodology to assess occupier's views of their new home and how it performs.

The table below provides a summary of the progress to date:

			CONFIRMED PARTICIPATION							
			Case Study 1	Case Study 2	Case Study 3	Case Study 4	Case Study 5	Case Study 6	Case Study 7	Case Study 8
			Chiltern Close	Clyro	Red Dragon	Sarn	Croft Court	Llanbedr	Glasdir	Llys Hampson
1	DESIGN STAGE	BPE Activity								
		Thermal modelling		Scheduled	Scheduled		In Progress			
2		Thermal bridge analysis					Scheduled			
3		GHA Guidance to reduce overheating		In Progress	Scheduled					
4		Design Review	In Progress	In Progress	In Progress	In Progress	In Progress	In Progress		In Progress
5	IN-CONSTRUCTION	Diagnostic Airtightness					Done			
6		Thermography in-Construction	Done							
7	POST OCCUPANCY	Thermography post-Construction	Scheduled					Scheduled		
8		Co-heating and smart HTC	Scheduled					Scheduled		
9		Pulse Airtightness	Scheduled					Scheduled		
10		Structured Questionnaire (BUS)								In Progress
			5 More Case Studies yet to confirm participation							

Professor Fionn Stevenson (an expert in BPE and author of Housing Fit for Purpose) has been employed to advise on building performance activities. We are also undertaking a collaboration with Build Test Solutions Ltd to test out some of the innovative techniques outlined above.

Proposed project output: the key output from the BPE work undertaken in this project will be industry guidance targeted at social housing providers on why BPE should be undertaken, and how it can be done. The guidance will draw upon case studies developed in this project.

Whole-life carbon analysis

Whole-life carbon analysis is being carried out on a number of housing projects. This analysis includes quantifying both the operational and embodied carbon of a development over a 60-year time period.

Typically, operational carbon emissions are considered at design stage only (from SAP or PhPP design software), but we are also exploring how actual in-use performance can be established through BPE methods (Co-heating and 'SMART HTC').

Following a review of tools for measuring embodied carbon, eTool has been chosen and tested on a development by Western Solar. We are currently undertaking analysis of a Clwyd Alyn housing scheme at Llanbedr (38 units), the learning from this will be used to inform phase 2 at Glasdir (75 units).

Jane Anderson (an expert in embodied carbon and author of the BRE Green Guide to Specification) has been employed to advise on the whole life carbon activity.

Proposed output: the key output from this work will be industry guidance targeted at social housing providers on why whole-life carbon assessments should be undertaken and how to do it. The guidance will draw upon case studies developed in this project.

Work Package 4: Timber manufacturing - Better local manufacturing

Timber frame manufacturers

Extensive interviews have been held with SO Modular, Fforest Timber Engineering, Lowfield Timber Frames, PYC Group and Kalite Timber Frames which resulted in a report highlighting issues having a detrimental impact upon the cost and quality of timber frame and inhibit the ability of the industry to innovate and grow. The main learning points for the whole construction industry are:

- Investment and skills development need a sustainable order book and consistent flow of activity, higher margins, stable timber prices and space to grow;
- Planning and prediction are harder without standardisation or repetition;
- Late engagement, an inability to influence design, lack of control and design & build procurement are frustrating;
- There's a lack of knowledge about timber as a material, little use of home-grown timber and myths around its suitability;
- Change is slow, marginal and incremental with little evidence of feedback and innovation;
- Quality is a product of sound groundworks, better weather protection and better checks on site;

This work package has identified the potential for standardisation as a mechanism to address many of the challenges listed above. The research team are currently undertaking structured interviews with social housing providers and contractors to better understand their issues with the use of timber and explore their interest in procuring a more standardised product.

Following this consultation phase, it is anticipated that a group of the most engaged timber frame manufacturers in Wales and the borders will be brought together in a workshop with the aim of mapping out a strategy for creating a standard specification.

Proposed project output: the key output from this work package is currently expected to be an industry co-created standard specification combined with a quality assurance process validated through building performance evaluation.

Joinery manufacturers

Engagement with the projects listed in Work Package 2 has resulted in locally manufactured timber windows being specified and used on a number of projects. Two workshops have been held and attended by housing clients and the Welsh joinery sector. These workshops highlighted many barriers to the specification of timber windows.

Proposed project output: to address the specification issues a client focused specification tool will be created that draws on case studies supported during the project.

Meetings and workshops with the joinery sector have identified many challenges faced by small Welsh manufacturers to meet the demands of the social housing sector. Maintenance concerns and the cost of additional regulatory barriers associated with supplying public housing projects are perhaps the most significant. To explore strategies to help the sector create an effective supply chain response to the new demand flowing from the social housing sector, an invitation only third workshop will be held with the Welsh manufacturing industry.

Proposed project output: a sector development strategy plan to address how Welsh joinery companies might more effectively supply timber windows into the social housing sector.

The use of home-grown timber for the manufacture of windows has been explored in a case study and demonstrated with a window manufactured by Custom Precision Joinery from Welsh grown larch – from wood that was otherwise destined to be a garden sleeper. The case study can be viewed [here](#). The window was exhibited at WoodBUILD 2019.

Work Package 5: Forestry – More and better home-grown timber

This work package identifies the timber that we currently grow and harvest in Wales, how much is used in construction and where the rest goes. It will go on to review how this supply chain could be improved to reliably supply a higher proportion of possible future construction demand (particularly social housing) while improving the case for growing the underlying timber supply through expansion of Welsh forestry.

Research completed so far shows that in Wales:

- Around 1.6M m³ of timber is harvested, sourced equally from public and private forestry.
- The Welsh processing sector receives around 60% of this and converts it (plus some imported logs) into around 1.3M m³ of products in 2017
- Less than 50,000 cubic metres of these products (or 4%) is sawn construction timber
- That the potential demand for timber in construction is many times its current level. If Government aspirations for social housing are met by homegrown timber, this alone could represent a demand of 120,000 m³ (around 3.5 times total current supply).
- A forecast reduction in supply of commercial softwood species will not be resolved by planting alone (due to timescales), although the main one (Sitka Spruce) represents 55% of the total softwood resource and 32% of timber overall, so other material is potentially available.
- We import most of the timber currently used in construction in contrast to the fencing and panel sectors

Recent research suggests that a much greater proportion of Sitka spruce timber harvested (up to 90%) could be graded for structural sawnwood construction timber. The favouring of other markets, taken together with the challenges of future log supply, suggests that the benefits of increased demand for timber in Welsh social housing will not be captured by the existing domestic supply chain without a significant change to supply chain dynamics.

Shifting the focus of the primary processing sector towards construction will certainly need to address the perceived risk in moving from current commodity, niche and informal markets and provide sufficient economic return to the growers and processors.

Small capacity sawmills may be best served by converting niche higher-value products given the challenge of economically converting strength graded softwoods at small scale. Undervalued oversized softwood sawlogs of several species may be converted to high-grade joinery elements for staircases or massive section and laminated window sections. The potential for small and medium sawmillers to produce joinery softwood will be explored. The efficiency and effectiveness of the approach will be evaluated against production at larger sawmills where the challenges of drying, storing and grading timber differ.

The large mills in Wales (BSW at Newbridge and the combined sawmill and board factory operated by Kronospan at Chirk) currently represent 80% of the output from the sawmilling sector in Wales. The remaining 20% of output is spread across 50 or more small and medium-sized sawmills across Wales.

Pontrilas sawmill located in the Marches 12 miles from Abergavenny is arguably better integrated into the Welsh construction timber supply chain than existing Welsh mills. Pontrilas has recently been persuaded in part by the Home-Grown Homes project, to set up a chain of certification which audits and identifies Welsh-grown C16 spruce, allowing Welsh specifiers to buy Welsh softwoods. This insight plus work with existing and planned smaller mills, and other stages of the supply chain, will form the building blocks for a future business model, defining what may be optimised, and where additional new facilities and technology may be required.

The work package will, in particular, make recommendations around the economic model for value flows across different supply chains, with reference to wider economic scenarios taking into account the impact of fluctuating import prices between larger and smaller scale sawmill business models.

Research to be undertaken in this work package will explore what interventions might be required to better align the Welsh forest with construction timber demand. The areas for investigation are summarised below.

- The opportunities for small, medium and large mills to supply specific construction markets (for both joinery and structural sawn wood).
- The opportunity for bringing undermanaged woodlands into management to reduce pressure on softwood demand in other markets (e.g. fencing and biomass)
- The opportunity for bringing underutilised species into the construction supply chain (including but not limited to Douglas fir, Western red cedar, Japanese cedar, Western hemlock, Coastal redwood, Noble fir, European silver fir, Grand fir, Pacific silver fir, Leyland and Lawson cypress, birch)
- The ability to mobilise demand for construction timber from Welsh forests in a way that can encourage tree planting at all scales.
- The opportunity to add-value to Welsh timber through engineered timber processes

- The potential for collaborative approaches across the small and medium mills to provide greater supply and commercial confidence
- The use of specifications for a range of wood products which will consider the functional requirements of wood elements, the selection of timber species and the design of appropriate processing solutions.
- The potential for standardised approaches being investigated in Work Package 4 to facilitate the demand side certainty necessary for supply side confidence. Delivering consistency of quality, pricing and supply is necessary to allow for the investment required to create a state of the art, integrated supply chain in Wales.

Proposed project outputs:

- *A description of the current Welsh timber supply chain from the forest area and log supply to the source, specification, quality and quantity of structural, construction and joinery grade timber produced*
- *The details and characteristics of the future timber supply chain required to meet potential public sector demand from the housing and 21st Century schools building including production scale, forestry scale, forest management practices etc.)*
- *Suggested interventions, predominantly for Welsh Government (National and Regional) to assist in the transition from 1 to 2 (above).*
- *Suggestions for functional specifications to deliver certainty to buyers of Welsh timber and target qualities for growers and processors.*
- *Guidance for increased and improved woodland management, in pursuit of and underpinned by the improved demand for high quality, sustainable, local timber.*

Work Package 6: Demonstration

This work package has two elements:

A Net-Zero Carbon Building Solution

Following the Project evaluation and considering some current advances in Modern Methods of Timber Construction and Whole Life Carbon thinking, we have worked with Powys CC to follow a different approach to that originally envisaged. Rather than design and build a physical dwelling, a development team has been commissioned to develop a systemized approach based upon fabric first principles: maximising the performance of the building components and materials first and also employing a Whole Life Carbon approach. The aim is to design a build solution and then consider how it might be employed to maximise the carbon capture, use and storage impacts demanded by Welsh Government.

A specialist team has been recruited and the focus of the work so far has been the development of the building fabric, plans and a fully elevated 3D model that will be assessed using the Passive House Planning Package (PhPP) by passive house specialists within the team. The model will also be used to ensure the structural integrity of the design.

The solution will follow the UK Green Building Council framework and consider embodied carbon in the timber (and potentially wood fibre); operational carbon (using a performance-based approach); renewables and offsetting.

An Education Project

Two options have been proposed so far: the development of a demountable building (or 'pod') made from timber that can be used as both a classroom/workshop and also as an inspirational showcase for what can be achieved with timber; or the development of learning and communication materials that can be used to promote the skills and knowledge of timber and its value as a building material.

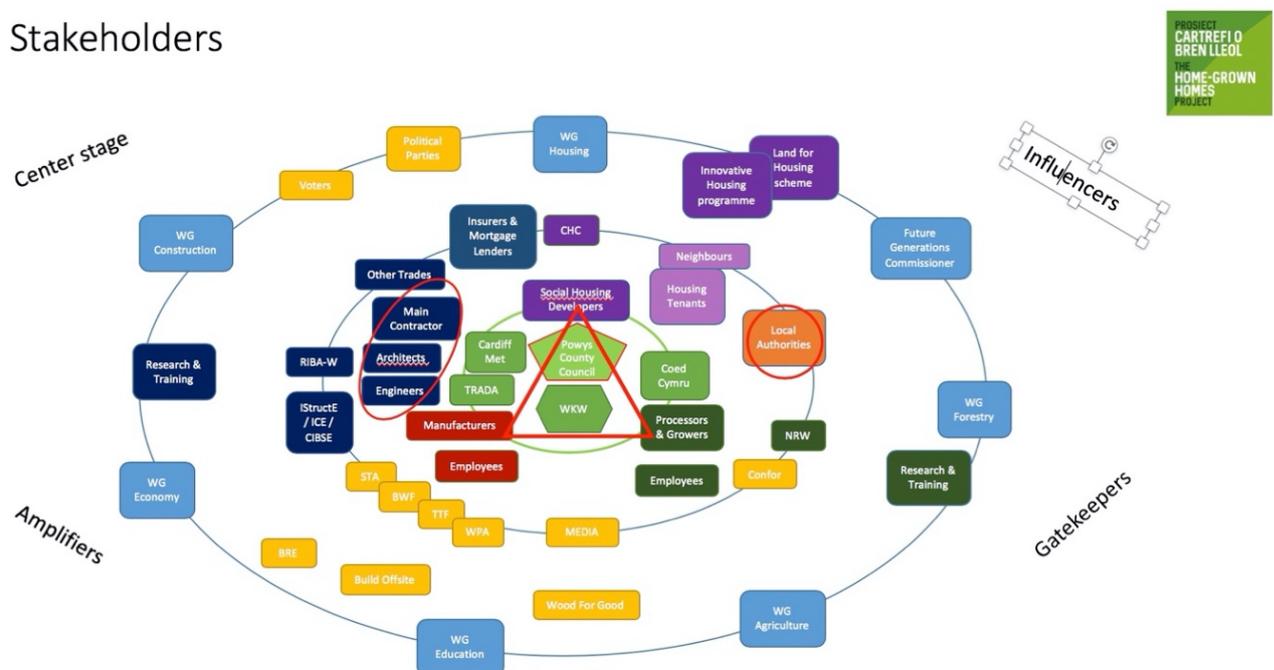
Work Package 7: Stakeholder engagement, dissemination and management

The project was launched in Cardiff in June 2018 by Julie James AM at the national timber conference, WoodBUILD, organised by Woodknowledge Wales. Workshop events have been held on timber windows and wood fibre insulation. Updates to the project were provided at WoodBUILD 2019 in Bangor ([event report](#)). A project website (www.hgh.cymru) has been established and regular project updates are reported in the WKW newsletter.

Following recommendations of a review of the project, further resources in terms of personnel and funding have been assigned to this work package. As a result, Woodknowledge Wales has engaged a marketing and communications expert with experience in the timber industry. A communications review has identified key messages and platforms across different stakeholders and will ensure that key learning from the project is captured and communicated effectively.

The stakeholder map (see below) will be refined over the coming months with input from project partners about specific stakeholders within their particular sectors. The map will be used to help deliver the key messages and learning from project.

Stakeholders



Engagement with the supply chain is extensive. Some of the key data related to project key performance indicators is summarised in the table below.

CSDS – 81186: RDP 16.2: Home Grown Homes Supply Chain Development Study		
Performance Indicator	Project Targets	Progress to end June 2019
Number of co-operation operations supported	Target number: 6 Pilot construction projects supported	#13
Number of information dissemination actions / promotional and/or marketing activities undertaken	Target number: 12 6 client/architect CPD events 3 supply chain CPD events 3 national conferences	TBA 3 (Windows and insulation) 3 (WoodBUILD 2018/2019 & CHC)
Number of jobs created	Target number: 3 Employed in delivering the project	2 Full time: David Hedges, Diana Waldron 6 Part Time: Gary Newman (4/5), Dainis Dauksta (1/5), Ceri Loxton (3/5), Christiane Lellig (2/5), James Moxey (2/5), Graham Hilton & Dylan Jones (1/5)
Total public expenditure for training / skills	Target number: £200,000 Amount of project costs dedicated to training including salaries and external suppliers	£114,000
Number of feasibility studies	Target number: 3 Potential studies include, construction project specific study, training and skills centre, innovation centre, manufacturing centre	This KPI is no longer relevant to project delivery
Number of stakeholders engaged	Target number: 300 Engaged across all project activities but mainly through pilot projects, events and training	WoodBUILD 2018 - 110 WoodBUILD 2019 – 108 Windows event - 26 Insulation events – 70 Social media e-newsletter – 1100 twitter - 1012

Planning is underway for WoodBUILD 2020 which will be held in Cardiff in mid-June. A third window manufacturers workshop is scheduled to take place before the end of 2019 to

explore how they might collaborate better to overcome barriers to supply social housing projects. An open day to view the use of woodfibre insulation is scheduled for 2020. A general timber frame event is being planned for 2020 to be led by project partner BM Trada to disseminate findings from WP 4 – Better local manufacturing.

Project output includes:

- *Bi-monthly newsletter updates (and associated updates via social media)*
- *A monthly Project Bulletin for the project management board and engaged stakeholders*
- *Case studies - tailored to different audience segments*
- *Specification tools for windows, cladding and wood fibre insulation*

4. Discussion

The purpose of the Home-Grown Homes Project is to design and test out interventions that could substantially improve the timber construction supply chain in Wales. This interim report describes these interventions and provides early evidence of their efficacy. The final report will draw on these interventions to generate case study examples and industry tools to inform behavior change at key points in the supply chain from forest to home. Thus, ensuring that the findings from this study are not only used to inform Welsh Government policy, but also implemented by forward thinking organisations in Wales.

Since the start of the project in April 2018, the project team has engaged widely with the forestry, timber manufacturing and housing sectors. Regular project updates have been provided through the Home-Grown Homes website, e-newsletter and twitter. Two national conferences, 5 workshops have been held and attended many industry networking events. We have visited and interviewed architects, clients, timber frame manufacturers, housing projects and sawmills. These activities of these organisations have been supported through design reviews, building performance measurement and supply chain interventions.

This level of engagement is critical to project success. Additionally, the interest generated through this extensive engagement programme is already having a significant impact. Some of this impact is described below:

- Consortium members have been invited to support applications to Welsh Government's Innovative Housing Programme. As a result, many of the funded projects are now exemplars in the use of timber for the structure, cladding, insulation and joinery elements of social housing projects throughout Wales.
- Social housing organisations are requesting workshops and seminars to help inform future strategy in terms of building performance, carbon reduction, the development of local supply chains and forest establishment.
- One sawmill has created the brand 'Spruce Cymru' to target rising demand for local construction timber
- Recent data from the Structural Timber Association indicates a dramatic shift to timber construction in social housing in Wales. The report can be viewed [here](#). One social housing supplier has stated that the aim to build exclusively with timber.

- The Welsh Government innovation team commissioned Woodknowledge Wales to create a strategic [Zero Carbon Homes](#) report which was launched in the summer of 2019 by the housing minister at WoodBUILD and the environment minister at the Royal Welsh Show. Welsh Government is working closely with Woodknowledge Wales to implement many of the recommendations of the Zero Carbon Homes report, including the creation of a Zero Carbon Building Performance programme to help understanding and delivery, a Forest Nation network to facilitate the wider cultural shift towards trees and timber, and a Carbon Offsetting scheme increase investment into creation and management of forests.
- Natural Resources Wales has commissioned Woodknowledge Wales to produce a report on how social housing providers can best intervene in the timber supply chain.

5. Early conclusions

This project is a study for the timber construction supply chain in Wales. Its purpose is to identify and test out interventions that, if applied, could have a transformative impact on the supply chain and the delivery of low carbon social housing. The progress outlined in this report is from the first 19-months of a 33-month programme of activities. Emerging conclusions are:

Building Performance Evaluation

New technology and new tools appear to enable the cost-effective application of building performance analysis techniques at the design delivery and post occupancy stage of new housing developments. Such techniques if applied would help to improve the quality of delivery and enable clients to differentiate between buildings that work well and those that don't. It can be anticipated that knowledge of building performance (in terms of energy, health, comfort and usability) will drive demand for better buildings and create market pull for more manufactured timber solutions. The project team will be testing out the efficacy of building performance evaluation methods during the remaining months and a guidance report for social housing clients will be created. We have already recommended that Welsh Government support the establishment of a zero-carbon building performance network to share knowledge and learning.

Whole life Carbon Assessment

New technology and tools for measuring embodied carbon and real fabric energy performance appear to offer an affordable method for measuring whole life carbon of buildings. As whole life carbon assessment is integrated into good practice approaches or mandated through regulation, the benefits of timber construction will be better understood and quantified. The project team will be creating further case studies during the remaining months and a guidance report for social housing clients will be created.

Standardisation

Greater standardisation appears to offer a solution to delivering higher performance and lower cost Welsh manufactured timber solutions (for both joinery elements and timber frame). Greater standardisation would also reduce risks throughout the supply chain and enable a more robust link back to the Welsh timber resource. The project team aim to bring

the timber frame and joinery industries together for discussions around what is meant by standardisation and how a process could be implemented and governed.

Stimulating demand

Our research has indicated that there is strong interest from the social housing community to procure Welsh timber and Welsh timber products. However, there are many barriers associated with changing from current practices. Perceptions of risk and unfamiliarity with the supply chain are but two. Learning from case studies and workshops will be reflected in the development of timber specification tools.

Stimulating supply

Our research has indicated that there is sufficient timber of a suitable grade available in Wales to supply both structural and joinery grade timber into social housing. However, the Welsh supply chain is not currently aligned with the level of construction demand that this project is helping to stimulate. During the remainder of the project, the project team will be exploring interventions that could transform the quantity and quality of timber available to the construction market.

Becoming a high-value forest nation

The project's value has been given added weight by the development Welsh Government priorities associated with the climate emergency, the housing crises and the desire for foundational economic development. If the Welsh forest industry is going to contribute to solving these challenges, there will need to be a transformation to adding value as well as a social and cultural shift to embrace forestry. During the remainder of this project, the project team will be focused on producing communication tools to support this transformation.

Woodknowledge Wales
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