

WHY INVEST IN WOODFIBRE INSULATION MANUFACTURING IN WALES



A UK-WIDE
OPPORTUNITY





Woodknowledge Wales

An independent, for public good membership alliance championing the development of Wales' forest industries from tree to product for increased prosperity and wellbeing in Wales.

Woodknowledge Wales works across construction, timber manufacturing and forest industries to increase collaboration and develop new solutions. The organisation stimulates the demand for timber products and the increased use of home-grown timber by supporting members to deliver low carbon newbuild and retrofit housing projects. It shares knowledge through the publication of industry guidance and through an extensive events programme. This investment prospectus is an example of the organisation's activity in the timber manufacturing sector to encourage the production of timber products that help decarbonise the built environment.

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Disclaimer

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MINISTER'S FOREWORD



Llywodraeth Cymru
Welsh Government

As Welsh Government Minister for Climate Change with responsibility for both the natural and built environment, I am delighted to have the opportunity to introduce this investment prospectus.

The Welsh Government is committed to developing a sustainable low carbon economy and doing so in a way that makes the most of our natural resources. Development of our forest industries sector is central to this ambition. The sector offers significant economic development opportunities as well as contributing to our efforts to achieve net zero emissions by 2050.

We are committing considerable funds to deliver a plan to grow more trees and to convert more of those trees into high value construction products.

From our own Welsh Government woodland estate, we are working to ensure that we get more social and environmental value from the timber we sell.

We are paying landowners to plant trees with the ambition to increase our forest area by 180,000 hectares by 2050 – an increase from 14% to 22% of Wales.

An overarching timber industrial strategy is under development to ensure that our timber becomes converted into the added-value products needed by our low carbon society.

The manufacturing of woodfibre insulation not only provides an added-value market for our smaller diameter logs and residues, but also provides a key product for the decarbonisation of our homes. In particular, woodfibre insulation will support development of our vibrant timber frame manufacturing sector and is particularly important for the low carbon retrofit of our existing homes, many of which are solid wall.

Wales has proven strengths in construction, advanced manufacturing and forest industries sectors. We have a readily available and experienced supply chain which is well positioned to support the establishment of woodfibre production in Wales. We also have a strong higher education and further education provision to support skills development and technical innovation.

We are working hard to ensure that Welsh society supports the growing of trees and a shift to forestry. We have created a national forest to produce a connected network of trees throughout the length and breadth of Wales and are in the midst of an education campaign focused on providing a tree for every household in Wales.

There are many options for location with ready access to both the logs and the UK market.

With an unprecedented programme of major infrastructure planned for Wales over the next decade, we are gearing up our supply chain and skills base to respond to the challenges we face. We are confident that locating a woodfibre insulation factory in Wales will complement our programme and provide a lasting legacy for the construction, manufacturing and forest industries sectors. With a devolved government, Wales can offer easy access to decision makers and streamline communications between stakeholders. This means that we have the ability to fast track business opportunities and provide access to appropriate support, networks and contacts.

My officials are set to engage with key partners in our network, including training providers, construction companies and suppliers, with a view to providing the necessary partnership approach to deliver this exciting project.

I am confident that Wales will offer an ideal location to site woodfibre insulation production and have asked Tony Godfrey, Senior Business Development Manager, to act as your main point of contact going forward.



Julie James MS
Minister for Climate Change



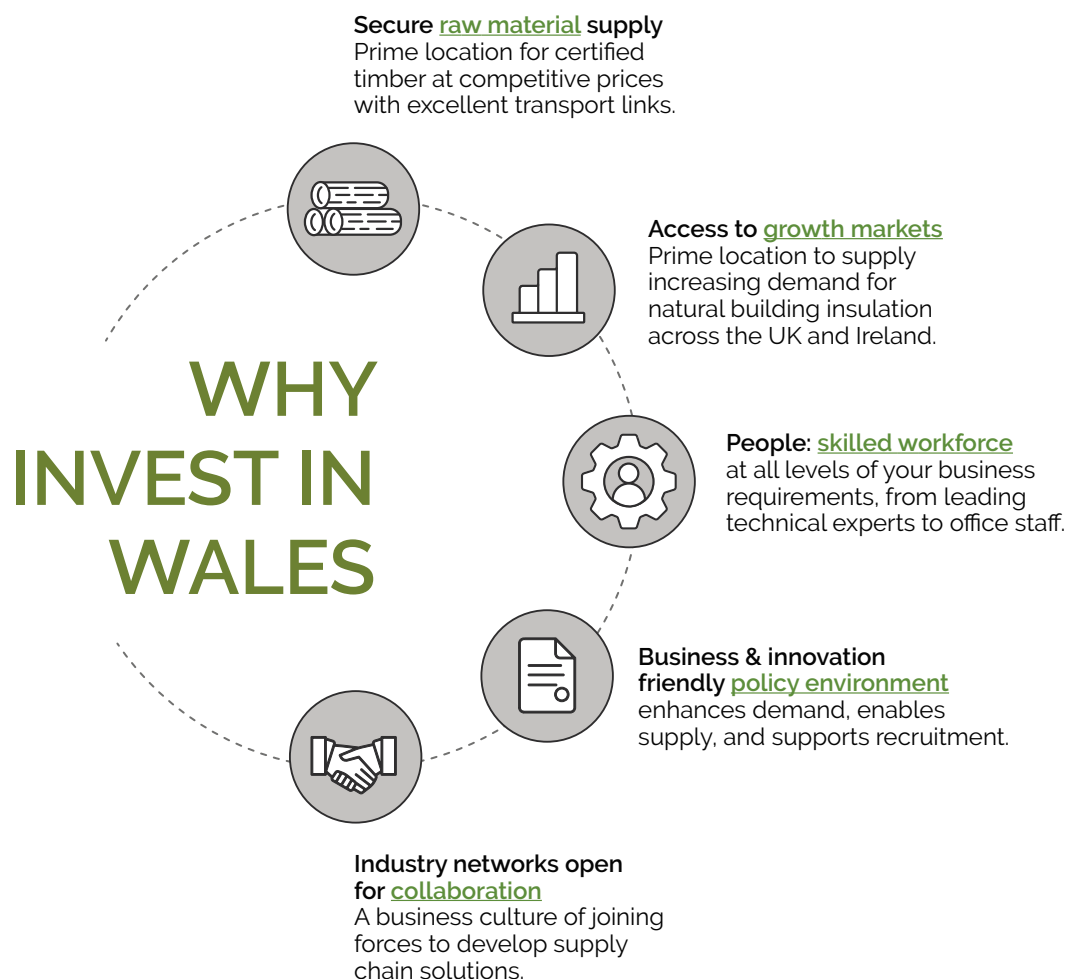
FROM FORESTS TO PEOPLE – WHY INVEST IN WOODFIBRE MANUFACTURING IN WALES

A healthy, high performance and low carbon built environment is an essential element of the Welsh Government's ambitious decarbonisation strategy. Welsh Government policy aims to ensure that low carbon homes are increasingly delivered by local companies using sustainable Welsh supply chains. The Welsh Government regards woodfibre insulation as a key material to decarbonising existing as well as new homes.

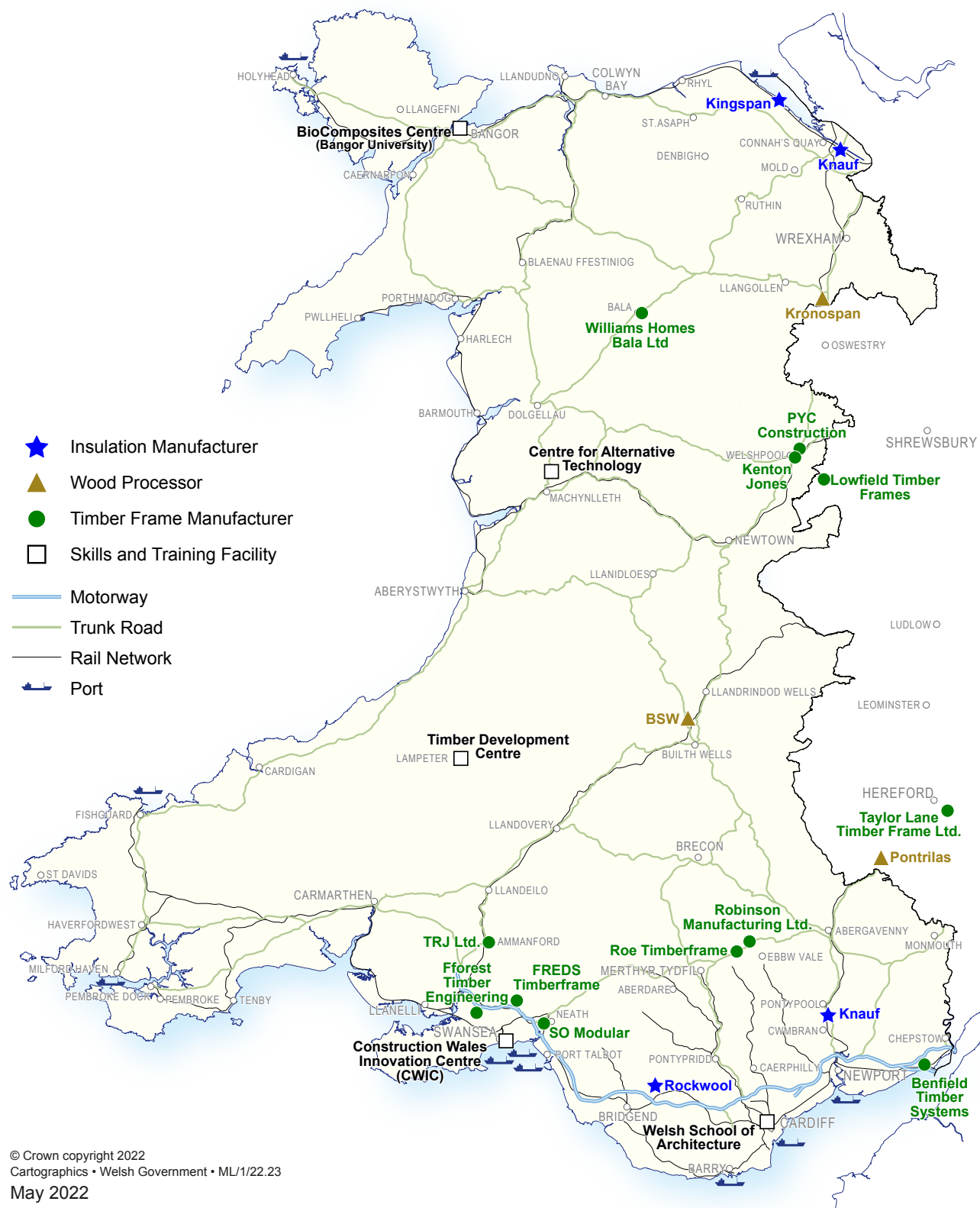
Woodfibre insulation has reached a level of market acceptance in the UK construction sector that justifies the establishment of a Wales based production centre. The Welsh Government believes that the high cost of transport from the continent is

now critically hindering market growth for woodfibre insulation products in the UK market. Locating the UK's first woodfibre insulation manufacturing facility in Wales benefits from the following key advantages:

- The development of the forest industries sector in Wales is a strategic priority and part of the Welsh Government's plans to re-focus the Welsh economy upon the sustainable use of the country's natural resources.
- The Welsh Government is implementing a range of ambitious policy interventions at both the industrial and the community levels to increase economic resilience and to support ambitious decarbonisation plans for Wales.

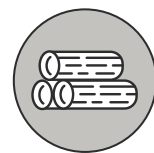


INVESTMENT LANDSCAPE



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May 2022





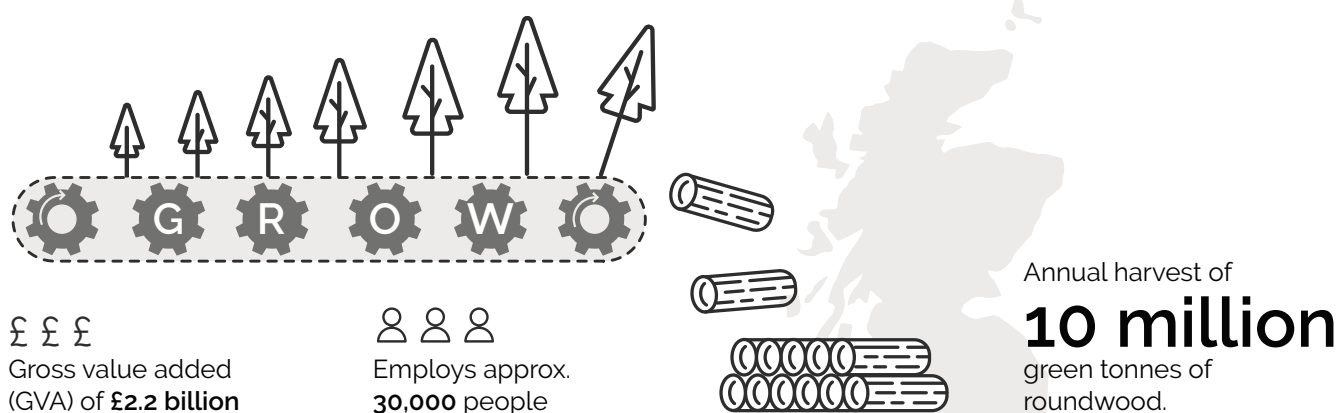
SECURE RAW MATERIAL SUPPLY

Wales offers a prime strategic location for timber feedstock sold at competitive prices. Wales has ideal conditions for the development of coniferous forestry and provides an excellent timber resource for secure

certified raw material supply today and in the future. Existing transport links via road, rail and sea connect Wales to feedstock supply from Ireland, Scotland, England and further afield.

Timber feedstock – availability today and tomorrow

The UK coniferous timber reserve – today

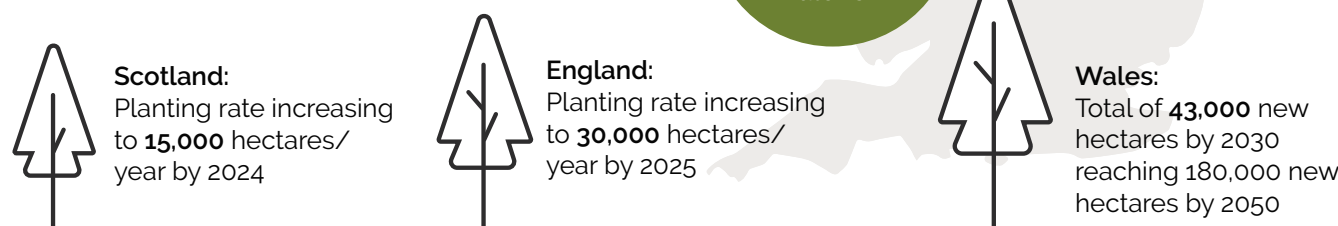


The UK timber reserve – in the future

Over the next 50 years the average UK softwood availability is forecast to be

15.2 million m³

based upon current forested area.



Certification:

Nearly all of these are managed under the independent UK Woodland Assurance Standard (UKWAS) and certified to either the Forest Stewardship Council (FSC) standard or the Programme for the Endorsement of Forest Certification (PEFC) and often both.



Ownership:

Of this certified woodland 40% is in the private sector and 60% under public ownership and management.

The Welsh landscape and climate is well suited to the economic production of the type of conifers favourable to woodfibre insulation manufacture. Due largely to the oceanic climate in Wales the typical yield class for the dominant Sitka spruce is very high

at YC16. Typical rotation lengths are 30-40 years with first thinnings available after 15 years. Forest industries are a key sector for the Welsh Government's ambitious decarbonisation plans.

Current material flows



Welsh coniferous timber is currently delivered into three main processors located in Wales and the Welsh border region:

- Kronospan panel products
- BSW sawmill (part of the Binderholz group)
- Pontrilas Sawmills (independent)

Processors purchase roundwood directly from the forest owner (such as Natural Resources Wales) or through forestry management and harvesting intermediaries such as Euroforest and Tilhill ([→map](#)). In addition to Welsh timber, sawlogs are supplied from England, Scotland and occasionally Ireland.

Small quantities of Welsh roundwood are also delivered into companies supplying roundwood fencing (e.g. Clifford Jones) and as biomass for energy generation.

UK industrial roundwood processing is currently dominated by wood-based panels (mainly Medium Density Fibreboard and Oriented Strand Board) and sawnwood for construction, fencing and pallet wood. Woodfibre insulation products would provide added value to use of small diameter roundwood, thinnings and processing residue. The Welsh Government Woodland Estate provides 735,000m³ to 835,000m³ coniferous roundwood per year to the market, typically sold as standing sales at open and competitive auctions held 4 times per year. Under the Natural Resources Wales Timber Marketing and Sales Plan 2021-2026 different sales terms can be negotiated for projects that deliver increased social, environmental and economic value.



ACCESS TO GROWTH MARKETS

Wales offers a prime location to access growth markets for building insulation in England and Wales. This is underpinned by a vibrant and growing Welsh timber frame sector which supports low carbon insulation products like woodfibre.

The UK insulation market is worth £1.38 Billion¹ with 70% going into building insulation. Government policies to achieve drastic reductions in carbon emissions will significantly enhance demand for low-carbon materials such as woodfibre insulation in the new build and retrofit markets (→[policies](#)).

Housing markets poised for healthy, low-carbon insulation

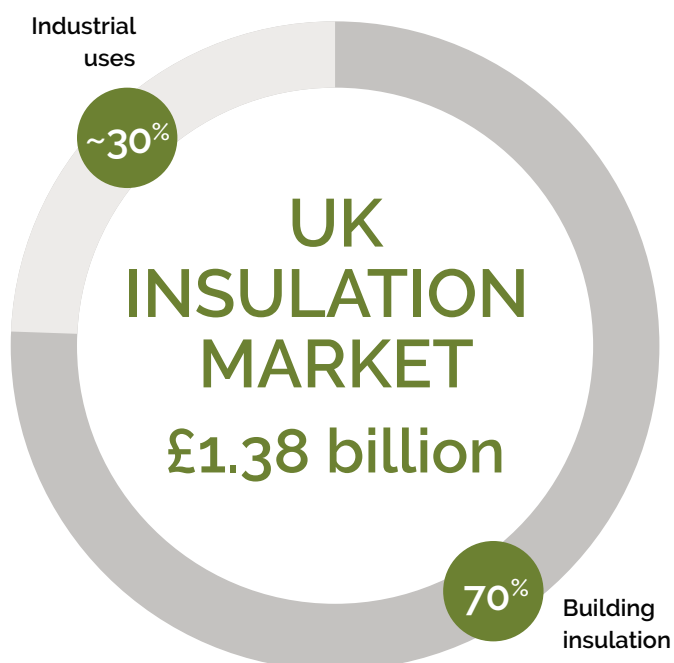
Reducing the energy consumption of UK homes represents one of the biggest challenges to achieving the UK Government's commitment to net zero carbon emissions by 2050.

The UK's housing stock is one of the oldest in Europe with a nearly untapped growth-potential for woodfibre insulation. The need for such retrofit is particularly high in Wales with 32% of homes constructed before 1919 and predominantly solid wall construction.

A natural ally for woodfibre insulation, the purpose driven shift from brick and block to advanced timber construction adds to a positive market forecast.

Drive for MMC and advanced timber systems

Offsite timber frame construction provides a great market opportunity for the use of woodfibre insulation in loose, flexible and rigid form. English and Welsh government policies are encouraging MMC to increase the delivery rate, quality and building performance of UK housing (→[policies](#)). Timber frame has become the dominant form of construction in government funded social housing projects in Wales.



Future demand

Retrofit

28.5 million homes. The UK's housing stock: one of the oldest in Europe.

Wall insulation. UK: 7.24 million homes with solid walls uninsulated. Wales: Approximately 50% of Welsh homes without wall insulation.

Loft insulation. UK: 8 million UK homes require loft insulation.

New build

UK: 300,000 homes/year target, current average of 165,000 homes/year.

The Future Homes Standard: 80% reduction in carbon emissions from new homes.

¹ contractor prices, 5-year average

Wales and the Welsh border region have become a key location for timber frame manufacturing (→[map](#)).

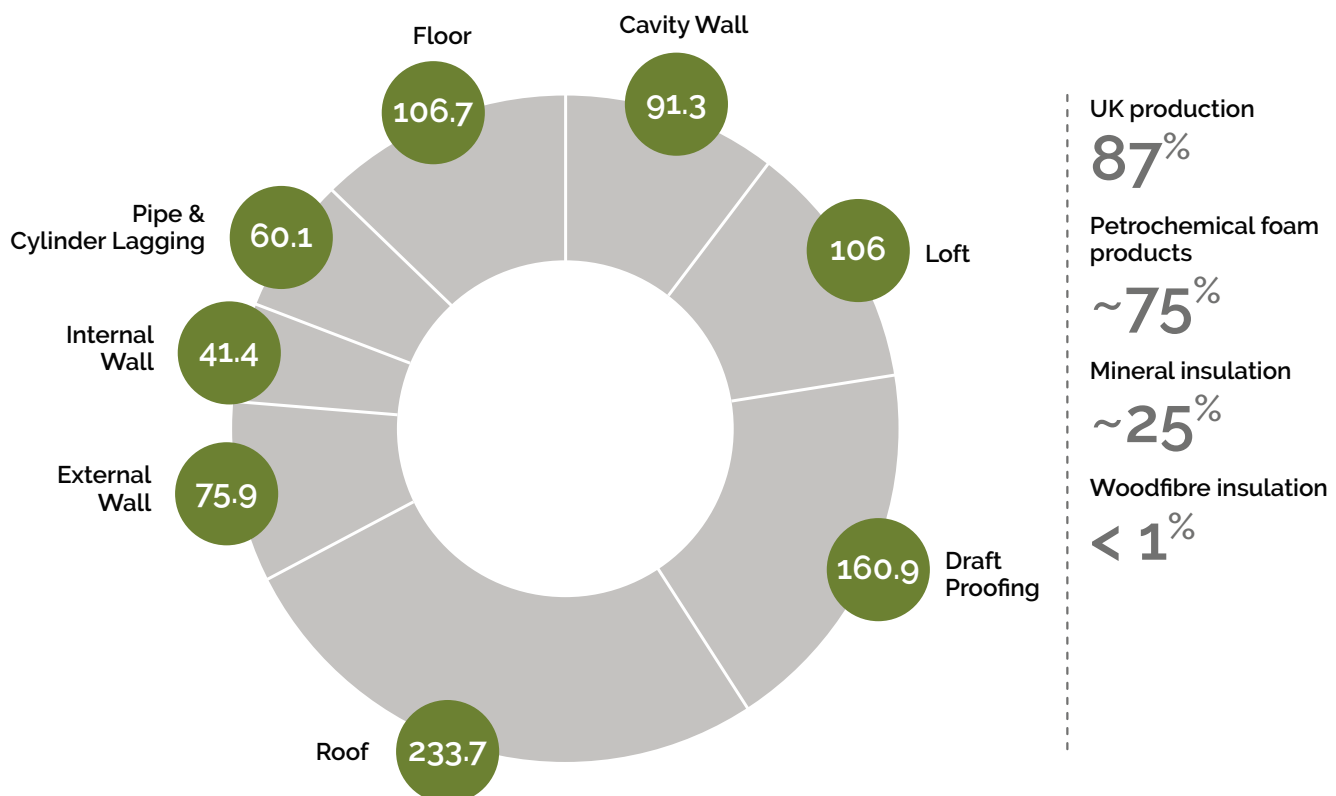
Market advantage for local suppliers

Woodfibre insulation has the potential to gain significant market share if manufactured in the UK. Current and forecasted transportation costs in this price competitive market negatively impact the growth potential of imported woodfibre insulation products.

Almost 90% of the UK insulation market² is supplied from UK production (→[map](#)).

Our policy frameworks favour low carbon materials such as woodfibre and encourage use of locally manufactured products in public procurement (→[policies](#)).

UK BUILDING INSULATION MARKET



Types of building thermal insulation by value in GBP (mio.), UK 2020

Timber construction in the UK

- Approx. 28% of all new homes timber frame construction in 2020.
- Growth rate of timber frame around 3% with 56% growth since 2014.
- Welsh timber frame manufacturers export ~60% to England.

² by value, Thermal Insulation in the UK (Mintel 2021)



PEOPLE: SKILLED WORKFORCE



Wales offers skilled workforce at all levels of your business requirements.

Engineering for the future

Wales offers some leading technical expertise in insulation and natural fibre manufacturing including a woodfibre insulation manufacturing pilot plant³. In North Wales, the BioComposites Centre at Bangor University boasts cutting edge research and innovation into wood-based panels and advanced composites from timber. In South Wales,

Construction Wales Innovation Centre (CWIC) is developing a Timber Development Centre for industry collaboration on product innovation and testing⁴. Across the border in Hereford, the New Model Institute for Technology and Engineering NMITE is driving applied research in timber construction with a possibility to further develop use of woodfibre insulation in this context (→[map](#)).

³ BioComposites Centre, Bangor University
⁴ Lampeter

- The **Construction Wales Innovation Centre** (CWIC) is an all-Wales construction training facility based in Swansea with a focus on net zero carbon, the digital revolution, modern methods of construction (MMC) as well as the repair of traditional buildings.
- The **Timber Development Centre** is in the process of being established in Lampeter. Its purpose is to inspire and support the use of timber in the built environment to enhance the transformation to net zero carbon.
- **Bangor University** is the UK's leading provider of education in forestry and wood science with a global reputation. The **BioComposites Centre**, a spinout from Bangor University, is a UK Centre of Excellence in wood-based panels.
- The **Centre for Alternative Technology** has been championing natural low carbon construction for over 50 years and now provides one of the UK's leading post graduate courses in sustainability.
- The **Welsh School of Architecture** is a world-renowned school of architecture based in Cardiff with a strong tradition in designing with timber.





Welsh Government Support

Welsh Government has the ability to support high value projects delivered by companies that align with its core values. Financial support is discretionary:

- Fair working practices
- Promotion of health, skills and learning in the workplace
- Progress in decarbonisation and lowering carbon footprint
- Potential for growth and development

By high value, this means projects that sit within Welsh Government's core areas of tech, life sciences, advanced manufacturing, low carbon energy, bring headquarter functions to Wales, show a strong propensity to export internationally, have a significant focus on research & development and will offer salaries above the local average.

Property Development Grant

This discretionary grant provides aid to the companies for the development of sites and premises including the provision of infrastructure and utilities or extension, renovation, refurbishment or conversion of existing commercial sites and premises and associated environmental enhancements. Funding can be given for either speculative, pre-let or bespoke schemes where such development would not otherwise take place

because of a deficit between the costs of the project and the value of the completed development.

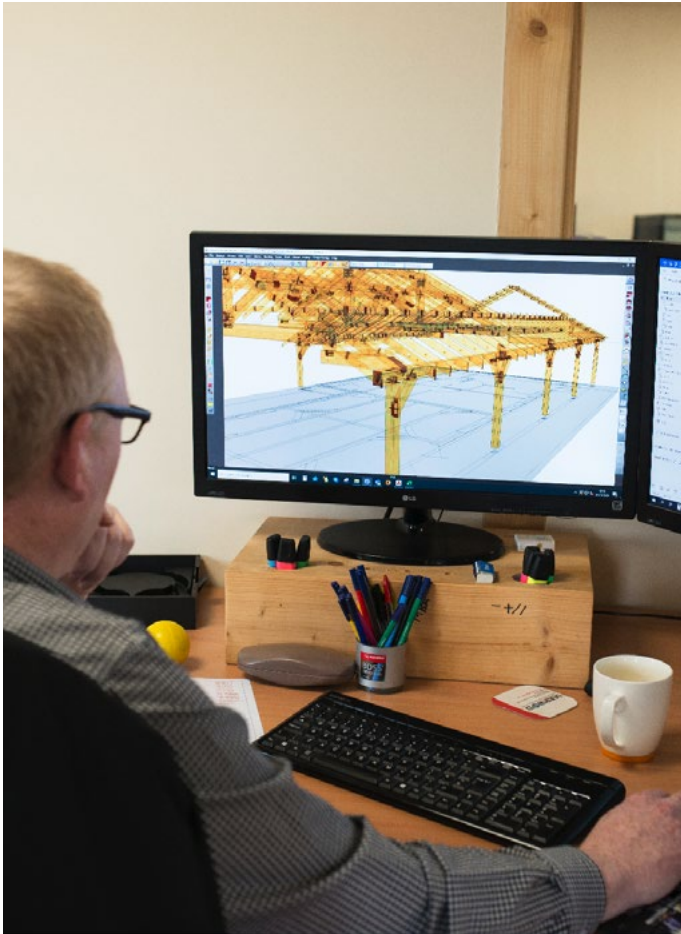
Economic Futures Fund

Where there is a funding gap or where it can be demonstrated that support can enhance or accelerate a project, the Welsh Government's Economic Futures Fund can support job creation projects. Support is based on new employment arising from the investment being created in Wales and the level of capital investment.

Support can be in the form of a grant or repayable loan.

Research, Development and Innovation

- **SMART Expertise:** Funding for R&D collaboration between industry and research organisations.
- **Open Innovation Feasibility:** Funding up to £30,000 (50% of eligible costs) for a study into adopting an open innovation culture, leading to a strategic and managed approach to collaborative R&D.
- **Knowledge Transfer Partnerships:** Programme linking a company with a university and a named graduate or post graduate to deliver a specific industrial project.
- **SMART Innovation:** Impartial information and guidance delivered by a dedicated network of Innovation Specialists.



- **SMART Cymru:** Up to £335K (per company) via 4-stage support framework aiding businesses undertaking research projects to develop technologically innovative products, processes and services. Innovation vouchers – Supports expertise from private sector or academia. Includes support for process improvement development in manufacturing or design.

Flexible Skills Development

This grant funded programme is designed to encourage and support the development of a company's employees as part of a business development project. Funding is up to 50% of training costs. It is open to all areas within Wales.

- Training that is aligned to the achievement of a business development project, ensuring the workforce have the skills needed to support the project
- Business development projects that improve productivity and competitiveness
- Business development projects that help businesses keep pace with the latest technology and working practices

Apprenticeship Programmes

The fully funded Apprenticeship programme in Wales is designed around the needs of the employer

and can help transform businesses by providing the skilled workers and a future pipeline of talent. All employers in Wales can access and engage in high quality training that will drive a knowledge based economy, allowing employers and their employees to achieve their full potential. Skills, including apprenticeships, is a matter devolved to the Welsh Government. Further information about the Apprenticeship Programme in Wales including FAQ's on the apprenticeship levy are available here:

[Apprenticeships. A Genius Decision. A Guide for Employers.](#)

In the case of degree apprenticeships, the Welsh Government fully funds the fees, and the employer covers the cost of the degree apprentice's wages. Other students who live and study in Wales would usually apply for a Tuition Fee Loan up to the maximum cover of £9,000 for tuition.

Degree apprenticeships in Wales are focussed on 3 priority areas:

- Engineering
- Advanced Manufacturing
- IT/Computing

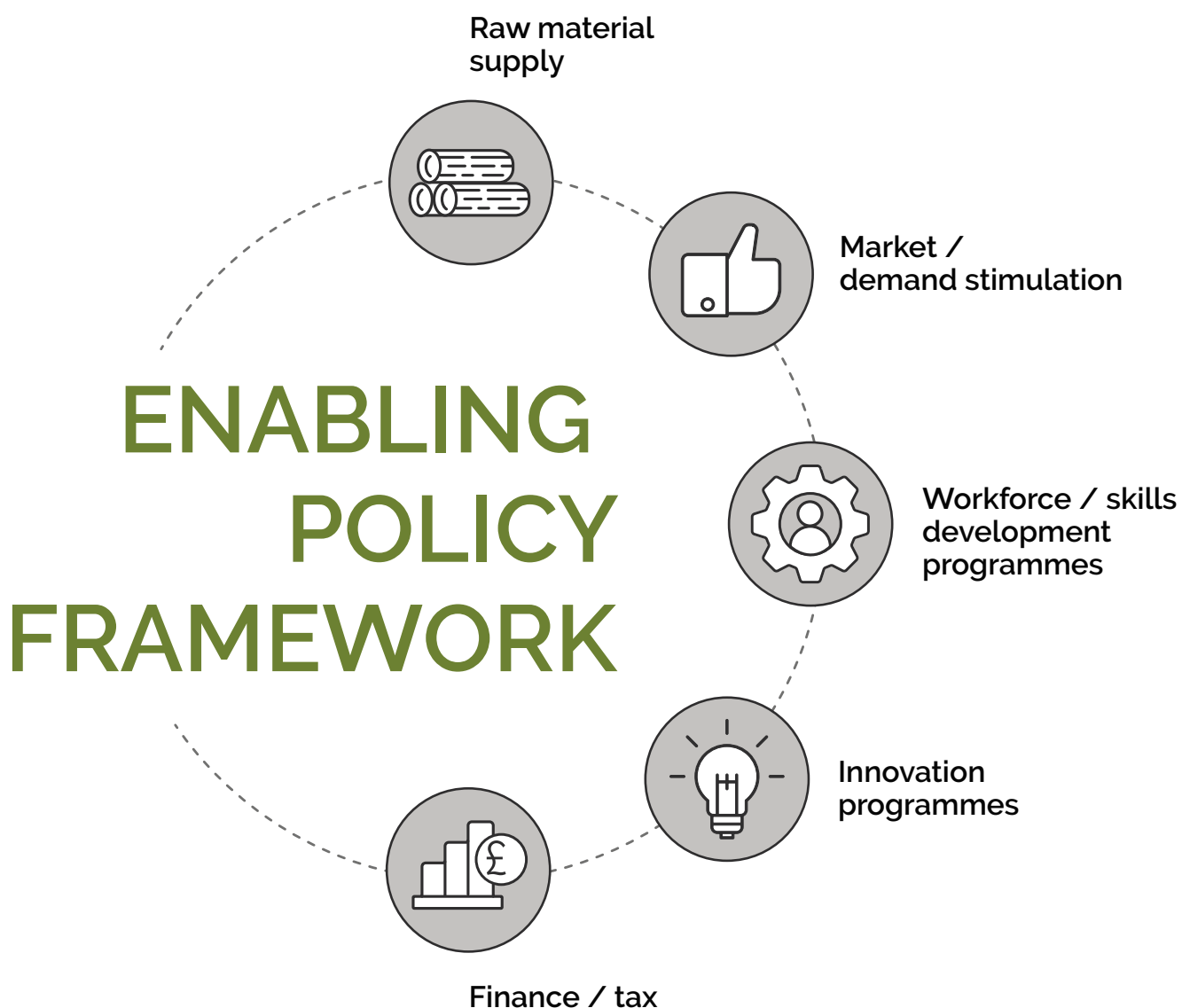
[Degree Apprenticeships | HEFCW](#)



BUSINESS & INNOVATION-FRIENDLY POLICY ENVIRONMENT

Wales' joined-up policy framework enhances demand for low carbon materials, enables raw material supply, offers innovation friendly business conditions and supports access to prime markets and a skilled workforce.

The Welsh Government Business Support Team can help you identify your ideal premises and advise you on how to access financial incentives, support and finance for innovation, growth, capital projects, international trade, skills development, ICT and e-business.



Timber industrial strategy. Increases fiscal and non-fiscal value of Wales' forest resource.	  
Afforestation policies/Glastir. Government grants to encourage landowners to grow trees. £8 million/year to support ambitious afforestation targets in line with UK CCC recommendations.	
Environment (Wales) Act (2016). Enables planning and management of Wales' natural resources such as forestry and timber for a low carbon, green economy, ready to adapt to the impacts of climate change.	 
The Climate Change Act. Reduction of greenhouse gas emissions by at least 100% of 1990 levels (net zero) by 2050. Legal commitment to meet the target of 78% reduction in emissions by 2035.	 
Well-being of Future Generations Act (2015). Legal obligation to improve social, cultural, environmental and economic well-being. Public bodies in Wales must take account of the long-term impact of their decisions.	 
Development Quality Requirements for Social Housing WDQR. Investment of £250 million/year for the next 5 years to support delivery of 20,000 new low carbon social homes, encouraging the use of timber and locally manufactured products.	  
Optimised Retrofit Programme for Social Housing. Investment of £140 million for low carbon retrofit measures to achieve a net zero carbon standard.	  
Building Regulations – Part L & F. From July 2022 significant reductions in carbon emissions required in England (Wales autumn 2022). From 2025 all new homes to be 'zero carbon ready'.	
Skills and Training Programmes. With support from Welsh Government's Recruitment and Staffing, Workplace Skills and Leadership programmes, your business can grow and reach its full potential.	
Modern Methods of Construction (MMC) strategy. Encouraging use of advanced timber frame systems and supporting investment in the sector predominantly through loan finance.	  
SmartCymru. Offers access to finance across all phases of R&D from initial feasibility and industrial research through to experimental development and exploitation within Wales based businesses.	  



Raw material supply



Market/demand stimulation



Workforce/skills development programme



Innovation programmes



Finance/tax



BUSINESS NETWORKS OPEN FOR COLLABORATION



The Welsh Government promotes the spirit of collaboration within and across industry sectors to develop solutions to the complex challenges we face today. A number of organisations offer opportunities for industry driven supply chain solutions throughout Wales.

Woodknowledge Wales

A not-for-profit, for public good organisation championing the collaborative development of forest-based industries for increased prosperity and wellbeing in Wales.

The organisation's Communities of Practice (CoP) promote an open and collaborative approach which enables the participation of a diverse network of organisations, both across supply chains as well as within trades. The CoPs are centred around practical solutions and capacity building and give members

the opportunity to prototype innovative approaches together with others. Each community defines its own agenda and schedule of actions based on the needs of its members.

woodknowledge.wales

Constructing Excellence Wales

Welsh built environment organisation working with all different elements of construction with both large and small organisations in the public and private sectors to help the industry to improve its performance to deliver better quality and value for money to its clients and end users. CE Wales organises networking events and conferences and runs an annual award scheme. Current projects include waste management, DfMA, new build and retrofit programmes.

cewales.org.uk

WOODFIBRE MANUFACTURING IN WALES – YOUR INVESTMENT OPPORTUNITY




The authors' analysis suggests that woodfibre insulation, which was introduced into niche markets in the early 2000's, has now reached a level of market acceptance that justifies the establishment of UK manufacturing. We believe that the high cost of transport from the continent as well as lack of product availability is now hindering market growth.

Geographically, Wales provides a prime location for access to quality timber resource and growth markets across the UK.

The Welsh Government's policies are creating an enabling environment that enhances market opportunities for woodfibre insulation, in particular in the growth markets of new build and retrofit housing, and secures raw material supply in the future.

SUPPORTING INFORMATION

UK Forestry



Forest Research

Forestry Statistics 2021

A compendium of statistics about woodland, forestry and primary wood processing in the United Kingdom

Release date:
30 September 2021


Coverage:
United Kingdom

Issued by: Forest Research
231 Carstorphie Road, Edinburgh, EH12 7AT

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statistics@forestresearch.gov.uk


Statistician: Sheila Ward 0300 067 5236

Website: www.forestresearch.gov.uk/statistics



The Research Agency of the
Forestry Commission

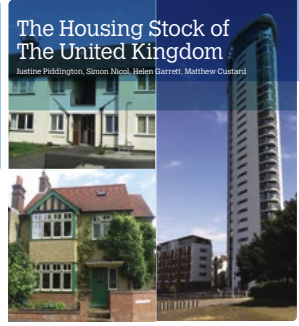
Housing




breTRUST

The Housing Stock of The United Kingdom

Austree Piddington, Simon Nicol, Helen Garrett, Matthew Cunniff



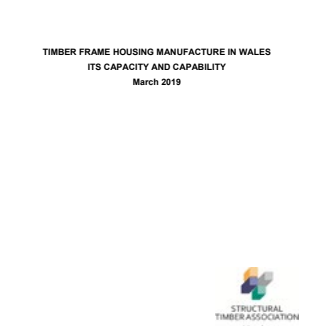
Timber Frame



Egan Consulting
Engineering & Planning

**TIMBER FRAME HOUSING MANUFACTURE IN WALES
ITS CAPACITY AND CAPABILITY**

March 2019



UK Market for Thermal Insulation



Mintel

Thermal Insulation - UK - 2021


Report Price: £795.00 | £1043.00 | £189.77



Woodfibre insulation


PROSIECT
CARTREFILO
BREN LLEOL

THE
HOME-GROWN
HOMES
PROJECT



Wood Fibre Insulation

Specification Guidance for Social Housing



For the attention of:
Andy Latham - FC Scotland
Dariusz Dabrowski - Wood Knowledge Wales

Wood Fibre Insulation in the UK

'The best kept un-trapped market in Europe'

A report for the Natural Fibre Insulation Network

Prepared by:
Gary Newman - Fibre Film Technology

1st April 2023

EXECUTIVE SUMMARY

Background
This report is intended to inform the development of a roadmap for the market expansion of wood fibre insulation to a level that would enable UK production facilities to emerge. The report was commissioned by FC Scotland and Wood Knowledge Wales.

Wood fibre insulation
Wood fibre insulation is available in three basic forms, loose, batts and rigid and is used for thermal and acoustic insulation predominantly in housing.

Insulation market
The UK insulation market is worth approximately £1.5 billion. The market has proved resistant to downturns and given that insulation offers the best return of any energy saving measure, market growth is likely to remain strong for the foreseeable future.

Market Potential
In Germany the market for wood fibre insulation is £840 million. In the UK the author estimates the market for wood fibre insulation to be approximately £1 million (0.1% of the UK market). There would appear to be strong opportunity for substantial market growth.

Market applications
The use of wood fibre insulation can be expected to take an increasing share of the insulation market. Key opportunities would appear to be in retrofit (internal and external wall insulation) and in timber frame new build.

Benefits of wood fibre insulation
Wood fibre insulation has a thermal conductivity similar to that of rock fibre insulation but has additional advantages in terms of thermal mass, hygroscopicity, health, durability and sustainability.

Regulatory environment
It can be expected that the trends in building performance and sustainability policy, legislation and standards, will help to encourage greater use of wood fibre insulation. Such trends include the drive to 'zero carbon' building, increasing recognition of the importance of reducing embodied carbon, the importance of indoor air quality and

Page 5 of 22

Mark Lym, ASBP Vice Chair & Managing Director of Fibre Research/Thermalframe discuss the multiple roles of insulation in building.



ASBP The British Acoustic Sound Performance

THE MULTIPLE ROLES OF INSULATION

ASBP Briefing Paper | December 2018

This paper is part of a planned series of ASBP industry briefing papers aimed at generating a greater understanding of the roles and capabilities of natural fibre insulation (NFI). In doing this, we hope to enable industry to deliver better buildings designed to take advantage of the significant building performance benefits of NFI.

Most of us recognise the importance of insulation in preventing heat loss and saving energy within the building but few of us connect insulation with other aspects of building performance. In this briefing note, we aim to highlight the many roles insulation plays.

Thermal Performance
When we consider thermal performance we often focus on the energy efficiency of a given thickness of material (thermal conductivity). Lightweight materials that appear to save a lot of energy when used in minimal thicknesses are often the preferred choice. But in many cases this is not the best solution.

Thermal performance is not just about reducing heat loss. Controlling the rate and pattern of heat loss as well as heat gain during the daily weather cycle and in response to the seasons is equally important.

It is a common misconception that only 'super ins' materials can be used to achieve excellent energy efficiency. Natural fibre insulation is capable of achieving the highest levels of energy efficiency. The only difference with NFI is the greater depth required. However, this greater depth of insulation rather than being a disadvantage provides many advantages.

The greater thickness and density of natural fibre insulation gives the building fabric greater thermal mass. This means as well as being energy efficient, NFI's help temper heat loss and gain on a daily and seasonal basis creating a substantially more comfortable living environment. The thicker layer of insulation also improves moisture buffering potential and acoustic performance.

Sound
The acoustic within our living spaces has a significant bearing on our quality of life and is one area that considered one of NFI's core strengths.

Many of us do not draw a connection between thermal insulation materials and acoustic insulation materials, instead believing that acoustic insulation is a specialist material that needs to be treated separately to thermal insulation.

ASBP | www.asbp.org.uk | 1 | December 2018



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Llywodraeth Cymru
Welsh Government

tradeandinvest.wales