

CYNGOR SIR POWYS COUNTY COUNCIL

CABINET EXECUTIVE

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REPORT TITLE: An Overview of the Council's Home-Grown Homes
Project

REPORT FOR: Information

1. Purpose

- 1.1. The purpose of this report is to provide Cabinet with an overview of the 'Home-Grown Homes' Project including the initial outcomes and aims required of the project, the results to date, and the proposals being considered for progression to Phase Two.

2. Background

- 2.1. The Welsh timber supply chain currently delivers the majority of its timber into low value products such as packaging, fencing, and garden furniture. Only an estimated 4% of Welsh timber currently ends up in construction, although 95% of harvested Welsh timber can meet construction grade¹. Apocryphal evidence suggests that this is due to a misconception that Welsh timber is of a poorer quality than that grown in Scotland or Scandinavia, which has promoted Welsh timber mills to channel Welsh timber into lower value markets such as fencing, pallets and paper. This fails to build on the opportunities for both economic development through delivering of higher value construction grade timber, or timber for added value products such as wood fibre insulation, cross laminated timber (CLT)² and glulam³.
- 2.2. The concept of the 'Homes-Grown Homes' project was initially developed through the Arwain⁴ LEADER Programme. The aim of 'Home-Grown Homes'

¹ 95% of Welsh harvested Sitka Spruce can be graded C16 to C27. C16 is primarily used in construction of walls, whilst high strength grades such as C24 will be used in roofs.

² Cross-laminated timber (CLT) is a wood panel product made from gluing together layers of solid-sawn wood, that is to say wood cut from a single log.

³ Glued laminated timber, abbreviated as glulam, is a type of structural engineered wood product constituted by layers of dimensional lumber bonded together with durable, moisture-resistant structural adhesives.

⁴ The LEADER programme is based on empowering local people to develop their own solutions to local issues, through local strategy development and partnerships, resource allocation and making the

was to develop the business case for a supply chain development project focusing on the Welsh timber supply chain and funded through the Rural Development Programme (RDP). The aims of the 'Home-Grown Homes' project were to:

- Build supply-chain capacity along established processing chain to increase local/home-grown market share.
- Work with 'clients' increasing local/home-grown product demands in high performance, low carbon, new build/retrofit housing.
- Increase higher value local/home-grown timber availability.
- Support the use of local/home-grown timber in broader construction developments.
- Liberate socio-economic value.

2.3. The overarching theme of the project would be to harness the spending power of Welsh Government through its investment in the construction of social housing in Wales (£250 million in Social Housing Grant for 2021/22), to drive economic development and job growth in the Welsh timber supply chain. The project would do this by delivering a series of case studies, reports and guidance to social housing providers including local authorities and housing associations, architects, construction companies, and the timber frame industry. This would highlight the advantages of timber as a construction material and offer best practice guidance on how this can be done effectively.

2.4. The long-term outcome of this would be the development and expansion of the timber frame industry, with Powys benefiting from increased jobs in the forestry sector, and also the timber processing, timber frame and modular Modern Methods of Construction (MMC) industries that are already established in the county.

2.5. Following award of £1.5 million of RDP funding, Woodknowledge Wales (WKW)⁵ were appointed to lead a consortium to deliver the project. The consortium was made up of four partners who each lead in different areas of the project:

- WKW leads the project and supports the other consortium partners. It would further lead on providing advice and support to several construction exemplar projects, which included the Council's Bowling Green, Clyro and Red Dragon affordable housing developments and lead on communications from the project and delivering a work package focusing on delivery of a 'zero carbon' home.
- Cardiff Metropolitan University leads a package focusing on delivery of guidance and tools for assessment of embodied carbon of developments

most of local development potential inherent in an area. Arwain is the LEADER programme for Powys.

⁵ 'Woodknowledge Wales' (WKW) is a not for profit, public good organisation which is working to develop and expand wood-based industries in Wales.

and conducting Building Performance Evaluation⁶, and further industry guidance on issues such as overheating. The university has also provided advice to the Council's developments at Clyro and Red Dragon.

- BM Trada⁷, a specialist consultancy providing independent timber testing across a wide variety of applications, leads a work package to support the development of the timber frame sector. This includes developing specification tools for timber frame construction and developing a method for auditing the amount of Welsh timber used in a development.
- Coed Cymru⁸ leads on interventions in planting and processing, which include investigating financial models to encourage the farming sector to plant forestry and looking into ways of developing the SME timber processing sector in Wales.

2.6. The project is managed by WKW, with oversight from the Council and a Steering Group, with representatives from the Council, the project itself, Welsh Government, National Resources Wales (NRW) and housing associations.

2.7. A requirement of the grant funding provided by the Welsh Government was for the project to be externally audited. This has been carried out by the Welsh Government's Integrated Assurance Hub through the Gateway Review process. Throughout the lifetime of the project, a series of reviews have helped to shape and direct the work of the initiative.

2.8. A final report was published in February 2021. The review team noted that project was seen to be initially overly ambitious, as successful supply chain interventions may take a number of years to have an impact. Accordingly, the final report to be delivered to Welsh Government has been designed to highlight the work undertaken as part of the project as a way to influence policy, that would support the objectives of the project. The report includes recommendations for the scoping of a second phase of the project.

3. Project Deliverables and Outcomes

3.1. The project has had a variety of deliverables, ranging from the final report, specification tools and industry guidance, to policy documents. They are summarised as below by work packages (please see Appendix 1 for more information):

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| Work Package 1 – Project Management: |
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⁶ Building Performance Evaluation (BPE) assesses the performance of a building, with particular emphasis on the building fabric, energy, fuel and water use, occupier satisfaction and occupier comfort.

⁷ BM Trada is part of the Element Group, an international testing, inspection, certification, and calibration business.

⁸ Coed Cymru is an environmental consultancy that works to improve the landscapes of Wales containing woodlands and trees.

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| | <ul style="list-style-type: none"> • Home-Grown Homes Project – A Study for Improving the Timber Construction Supply Industry in Wales • Five Essential Strategies for an Emerging Forest Nation (attached as Appendix 3) |
| Work Package 2 – Exemplar Projects: | |
| | <ul style="list-style-type: none"> • The Home-Grown Homes Exemplar Projects Google Map |
| Work Package 3 – More and Better Homes: | |
| | <ul style="list-style-type: none"> • Building Performance Evaluation Guidance • Embodied Carbon Guidance for Welsh Social Housing Developers, Their Design Teams, Contractors and Suppliers |
| Work Package 4 – More and Better Local Manufacturing: | |
| | <ul style="list-style-type: none"> • Making the Right Choices – A Guide to Improving the Quality in Timber Frame Social Housing • Timber Audit Report |
| Work Package 5 – More and Better Home-Grown Timber: | |
| | <ul style="list-style-type: none"> • Serious About Green? Building a Welsh Wood Economy Through Co-ordination • The Role for a Consolidator • The Financial Case for Existing Landowners to Plant Woodland • Investing in Woodlands – An Options Analysis for Welsh Housing Associations • The Role of Our Own Conifer Forests for Building a Sustainable Society in Wales |
| Work Package 6 – Zero Carbon Build Solution and Education: | |
| | <ul style="list-style-type: none"> • Net Zero Housing Framework Infographic (attached at Appendix 2) • Zero Carbon Homes – Zero Carbon Timber Solutions for Wales • Zero Carbon Homes Training and Leadership Programme • Carbon Storage Contract |
| Work Package 7 – Communications: | |
| | <ul style="list-style-type: none"> • Wooden Windows Specification Guidance for Timber Windows • Timber Cladding – Specification Guidance for Social Housing • WoodBUILD Conferences and Autumn Series Podcasts |

- 3.2. The outputs of the project have influenced the way house builders, local authorities and housing associations are considering the use of materials in construction.
- 3.3. During the project, housing associations such as Wales & West Housing Association have adopted policies making timber the first-choice material for their build programme, similar to the Council’s own Wood Encouragement Policy. Welsh Government has in the draft Development Quality Requirements (DQR)⁹, compliance with which is a condition of Welsh Government funding for social housing, specified timber as a material of choice for delivering low

⁹ Design Quality Requirements (DQR) sets out the minimum standards with which homes must comply to be eligible for financial support from the Welsh Government. The standards include minimum space requirements, encouragement for the use of Modern Methods of Construction and ‘whole life’ value for money.

carbon, energy efficient homes, and mandating that Welsh social housing is delivered to net zero standards, or as low carbon as possible.

- 3.4. The document “Embodied Carbon Guidance for Welsh Social Housing Developers, their Design Teams, Contractors and Suppliers” and the “Building Performance Evaluation Guidance”, produced by the project, have been commended by RIBA as comprehensive guides for taking forward decarbonisation and building performance, and have been recommended to RIBA members.
- 3.5. The project has during its lifespan enjoyed successful collaborations, and it has enabled the Council to further build on relationships with Welsh Government departments such as Housing, Forestry and Economy, and organisations such as NRW, all of which have been represented on the project’s Steering Group.

4. Decarbonisation

- 4.1. Both the Welsh Government and the Council have declared a ‘climate emergency’. The UK Government has adopted a target for the country to cut carbon emissions by 78% by 2035 and be ‘net zero’ in respect of carbon by 2050.
- 4.2. This has led to an increased focus on carbon within the construction industry, with concrete and cement ranked as the world’s third biggest man-made contributor to carbon emissions after energy and transport. The Welsh Government has, in support of its April 2019 declaration of a ‘climate emergency’ made reduction of carbon in the construction and operation of social housing a key consideration in deciding which developments will benefit from financial support.
- 4.3. Carbon in housing developments is often referred to in two contexts:
 - Embodied carbon – the carbon emitted in the construction of a building. This could be the carbon involved in the manufacture of the materials and products, such as concrete, bricks, fittings, etc. or it could involve the carbon emitted through the traveling of workers and materials to site and emissions from plant, such as loaders and excavators, used during construction, etc.
 - Operational carbon – the carbon emitted post construction in the lifetime of a building, including operational factors such as heating and lighting.
- 4.4. The ‘Home-Grown Homes’ project has focused more on the embodied carbon, as this is where the use of timber can reduce the amount of carbon emitted in the construction process. Work Package 3 has focused on reducing the operational carbon created by a building, with guidance on Building Performance Evaluation being produced for developers, architects, and employer’s agents. This will allow those commissioning and in the case of

social rented housing, managing the homes to properly monitor whether their performance of developments is what was promised. The form of construction can also affect the operational carbon dioxide with build forms such as Passivhaus reducing the requirements for heating systems.

- 4.5. 'Home-Grown Homes' by encouraging the planting of more forests in Wales has the potential to support 'decarbonisation' through the promotion of planting of forestry. This is because as trees grow, as part of the process of photosynthesis they take in and absorb carbon dioxide, emitting oxygen. The carbon remains in the wood until the tree or the timber rots, when it is released back into the environment as part of the process of decay.
- 4.6. The use of harvested timber in a way that prevents, or delays decay can extend the locking-in of this sequestered carbon¹⁰ in the construction of homes. This could be done through use of traditional timber frame and the use of engineered timber products such as CLT, glulam, or wood-fibre insulation, and Modern Methods of Construction ideas such as manufactured timber panels.
- 4.7. Use of these products can, if the process of decay is eliminated or much reduced, contribute to the reduction of embodied carbon created by the construction process. Guarding against timber decay and rot benefits from treatment at the point of installation. For timber exposed to the elements that prompt and hasten decay, for example cladding and fascia boards, regular treatment and maintenance need to be factored into the financial and environmental management of such homes. The 'Home-Grown Homes' project has provided guidance on the use and specification of timber cladding under their "Timber Cladding Specification Guidance for Social Housing" document, available via the WKW website.
- 4.8. Reduction of embodied carbon in the construction of housing has been the primary focus of Work Package 6. This involved the design of a house type that could be delivered across Wales. The 2-bed, 4-person three bed town house was designed in conjunction with architects and various specialists to deliver a home that would cost effectively deliver a 'net zero whole life carbon home'¹¹. This project remains live, as a number of factors raised by members of the steering group are addressed.
- 4.9. The project has offered many opportunities for Welsh Government, local authorities and housing associations to use the construction of social housing and proactive afforestation to meet the challenge of being carbon neutral by 2050. As highlighted later in this document, the taking forward of these opportunities would in themselves lead to economic opportunities for both

¹⁰ Carbon sequestration is the process of capturing and storing atmospheric carbon dioxide.

¹¹ A 'net zero whole life carbon' home is one where the carbon emissions from the construction and operation of the home over a projected 60-year life are initially minimised by using low carbon materials (timber and other natural materials) and a design to reduce the need for heating, any remaining emissions being counterbalanced through initiatives such as woodland planting.

Powys and Wales, with the potential of job growth throughout the timber supply chain.

5. Scoping of Phase 2

- 5.1. The 2020 review of the project by Welsh Government's Integrated Assurance Hub highlighted that: "since the outset of the Project, the drivers have changed because there has been a raft of new policies, legislation and a sea-change in opinion on climate change...the change-enabling products being developed by the Project could help governments meet environmental targets, making it a potentially attractive Project for future funding schemes". The review recommended that the project's Steering Group consider scoping a second phase of the project (Home-Grown Homes 2), to take forward the learnings to date with greater collaboration with both Welsh Government, NRW and the timber supply chain.
- 5.2. Influencing policy is seen as a positive way of further advancing the development of the timber supply chain, including the planting of trees and land use, but also with a focus on delivering a Welsh source of timber for products such as timber windows, glulam, wood fibre insulation and CLT, all of which would not only deliver the objective of the project but also reduce imports to the United Kingdom, creating local jobs and retaining more wealth in Wales and the United Kingdom.
- 5.3. The reviews have put particular focus on developing a source of Welsh timber windows that can be used in social housing. Any social housing schemes which wish to benefit from Welsh Government funding need to be compliant with Secured by Design¹² - currently no Welsh timber window manufacturer can meet this requirement. Working with the industry to gain this accreditation would open up a market of an estimated 65,000 windows a year in the Welsh social housing sector, across both new homes and fitting new windows to existing properties.
- 5.4. WKW have been requested to outline a draft scope for Phase 2 by the project Steering Group. This resulted in two potential project ideas:
 - 'Home-Grown Homes 2' – This would be delivered in a similar manner to the original project, with a focus on supporting local authorities and housing associations to deliver housing schemes that incorporated use of Welsh timber. This would also include working with the industry, Welsh Government and NRW to solve issues affecting the supply chain.
 - 'Home-Grown Homes 2+' – This would deliver the 'Home-Grown Homes 2' concept, but with an additional focus on job creation through the

¹² Secured by Design is an initiative led by the Police to make sure that homes are as secure as they can be, for example by making sure that doors and windows are designed to deter and prevent burglary and house breaking.

delivery of 'zero carbon homes' and low carbon retrofits. The estimations through the scoping exercise showed the potential of delivery of an estimated 1,300 jobs in varying industries including forestry, timber processing, construction and transport.

- 5.5. Meetings with Welsh Government have suggested that while the principle of 'Home-Grown Homes 2' are supported, financial commitments cannot at this stage be made, pending the development of national budget priorities across Wales¹³.
- 5.6. Accordingly, to maintain momentum pending any decisions by the Welsh Government on further funding, the Steering Group is recommending that three projects, that are in process, being initiated or subject to funding applications, be progressed:
- 'Home-Grown Homes 2' – the Welsh Government's Housing Department has expressed an interest in funding the project, initially for one year whilst other avenues of funding are investigated by the project and Steering Group. Powys County Council has agreed with the Welsh Government that it is happy to carry on leading the project on the basis that all incurred costs are included within any offer of funding.
 - Forest Towns – This is an expansion of a concept being delivered by Skyline in Treherbert. The concept aims to work with Welsh and local government, community organisations, the timber supply chain and construction companies to deliver forest expansion and training programmes for the local community. The project would deliver in three locations across Wales, with Machynlleth proposed as one of the locations.
 - 'Zero Carbon' Homes – This is the further development of the projects work on a 'Zero Carbon' Build Solution and involves further development of the plans to a create a mass produced MMC housing product, which could then be used across Wales by both councils and housing associations. The Council's Commercial Services Team (CST) has been successful in being awarded funding to deliver the procurement exercise for this project and is currently working with WKW and other stakeholders to develop the specification prior to tender.
- 5.7. The project and Steering Group are continuing to seek other avenues of funding, including through the Regional Growth Deals and funding streams such as RDP.

6. Opportunities for Powys

¹³ Following the Senedd elections in May 2021, a climate change ministry has been established by the Welsh Government, bringing together the environment, energy, housing, planning and transport portfolios.

- 6.1. The Council has helped lead the 'Homes Grown Homes' project since its inception, highlighting the potential for smarter and wider use of Welsh timber to drive forward economic development in Powys, Wales and the United Kingdom. The project aligns very closely with the Council's Vision 2025 Economy and Community aims and supports a directly and indirectly a wide range of the Mid Wales Growth Deal objectives and outcomes.
- 6.2. Powys has well established forestry industries with the largest sawmill in Wales being located at Newbridge-on-Wye and number of smaller mills being located across the county. The timber frame industry is likewise well established with a major national timber framer based on the Shropshire/Powys border, and smaller outfits existing in county. An example includes A.C. Roof Trusses in Welshpool which has supplied the timber frame for the Council's Bowling Green housing development.
- 6.3. Powys hosts a number of companies delivering MMC, including F1 Modular in Newtown and Modularwise in Knighton, both of which are on Welsh Purchasing Alliance frameworks for delivery of MMC to the public sector across Wales. In addition, there are smaller SMEs and micro enterprises in Powys, including for example PYC Construction which has expertise in the delivery of high quality Passivhaus MMC products.
- 6.4. The farming industry is increasingly looking to tree planting as an additional way of supplementing farm incomes. The geography and topography of the county also lends itself to further plantation of commercial forestry. Further planting of forestry will lead to job growth in the forestry and transportation sectors.

7. Advice

- 7.1. This report is for information only.

8. Resource Implications

- 8.1. The Contract Manager role of the project has been supported by the RDP grant on the basis of providing support for two days per week. The Contract Manager was responsible for monitoring performance of the 'Home-Grown Homes' project on behalf of the Council, including provision of management information (presented as project dashboards to the Steering Group), arrangement of Steering Group meetings, arranging the project assurance reviews, and communicating with the 'Home-Grown Homes' Project Manager to ensure the smooth and efficient running of the project. Part of the cost of the role of 'Service Manager - Housing Solutions', whose remit embraced 'Home Grown Homes' has been covered by the grant funding for the wider project. There has been no unfunded contribution from the Council to the project.

8.2. The Council has agreed with Welsh Government that the Council will retain the leadership role for the project on the basis that all associated costs incurred by the Council are fully funded. However, there is to date no confirmation from Welsh Government that funding will continue. If this funding is not forthcoming, there is no requirement or expectation of the Council to provide funding or to continue support for the project.

8.3 The Council's Section 151 Officer has considered the report, commenting that:
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9. Legal Implications

9.1 The Head of Legal and Democratic Services (Monitoring Officer) has commented that: “there are no legal implications flowing from the report”.

10. Data Protection

10.1. There are no data protection issues arising from this report.

11. Comment from Local Member(s)

11.1 The work of ‘Home-Grown Homes’ applies to all areas and constituencies in Powys.

12. Recommendation

12.1 Cabinet is recommended to:

12.2 Note the content of this report and the outcomes of the ‘Home-Grown Homes’ project and the Council’s commitment to continue in a leadership role for ‘Home-Grown Homes’, subject to funding being made available by the Welsh Government.

12.3 Note that the project has successfully delivered its outcomes, which has been confirmed by the Welsh Government’s assurance reviews.

12.4 Note the continuation of the ‘Home-Grown Homes’ Project with scoping of ‘Home-Grown Homes 2’ and the Council’s continued involvement could offer social and economic opportunities in Powys, prompt and encourage further work to consider how to improve the quality and fuel efficiency of social homes and make a contribution towards delivering the economy and health ambitions in Vision 2025.

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Appendix 1 – Home-Grown Homes Work Packages

Work Package 1: Project Management:

This is the WP that involves all of the project admin, financial management and progress chasing. It includes the regular meetings with project partners and WP leads. The finances are managed to secure partner invoices and make claims to Powys CC. Project progress is reviewed by the Steering Group – originally a Management Board, chaired by Powys CC. The project documents are stored digitally in the cloud using Dropbox. Three evaluation exercises took place during the project.

Work Package 2: Exemplar construction projects:

This WP involved engagement with stakeholders on exemplar projects across Wales which became the project case studies. Its purpose was to identify and respond to barriers to the development of the timber supply chain with knowledge exchange and specific tools – detailed in other WPs. The projects were case studies.

Work Package 3: Housing – Better timber homes

The work undertaken in this work package addressed 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. It included work on building performance evaluation to test various tools – again working with the exemplar projects. In addition, embodied carbon analysis was carried out on a number of projects. It also ended up producing industry guidance on both building performance evaluation and on embodied carbon.

Work Package 4: Timber manufacturing - Better local manufacturing

This WP focussed on the timber frame manufacturing sector in Wales – researching issues having a detrimental effect on the cost and quality of timber frame construction and the opportunity for growth. It identified the potential for standardisation as a mechanism to address many of the challenges. Interviews also took place 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. The main output from this WP was a report on the quality of timber frame build aimed at helping avoid many of the pitfalls and defects in timber frame construction. The WP also included engagement with a number of joinery manufacturers on the production of windows which highlighted a number of barriers to their specification. This subsequently led to the Welsh Windows project which is currently underway.

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

This work package identified the timber currently grown and harvested in Wales, how much is used in construction and where the rest goes. It went 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. The WP ended up producing a series of reports to support greater investment in the supply chain including investment in a wood economy, the role of a consolidator, the financial case for planting, capturing carbon in woodlands and the role of our conifer forests.

Work Package 6: Demonstration

This WP had two elements: a net Zero Carbon Build solution and an education project. Following the first Project evaluation WKW worked with Powys CC to follow a different approach to that originally envisaged. Rather than design and build a physical dwelling, a development team was 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. It resulted in a build solution which is currently being taken forward by Powys CC in partnership with ten other local authorities.

The education project focussed on traineeships, leadership and support for the education sector.

Work Package 7: Stakeholder engagement, dissemination and management

This WP as its title suggests included engagement and communication. Outputs included a website, regular newsletters and briefings, workshops and conferences and specification guidance all aimed at capturing the learning on the project.

Appendix 2 – Infographic – Net Zero Whole Life Carbon

