



Scoping Report: Proposal for a **Welsh Zero Carbon Housing Performance Hub**

Report prepared for ClwydAlyn with funding from the Welsh Government Collaborative Research and Innovation Support Programme (CRISP)

Authored by the Good Homes Alliance, Woodknowledge Wales and Building Performance Network

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Foreword

Addressing the Climate Emergency is a key priority for Welsh Government. It is important that we address the CO2 emissions in the construction sector, which account for around 10% of the UK's total carbon emissions. Over the period of the previous parliament, we have invested just over £1 billion in social housing and through the Innovative Housing Programme we have provided over £155 million of additional funding to encourage, lower carbon, higher performing buildings as well as accelerate this shift to Modern Methods of Construction. We have also committed £19.5 million to the Optimised Retrofit Programme for 2020/21 and a further £50 million in 2021/22 to test out and deliver new approaches to upgrading and decarbonising existing homes.

This investment has also been targeted to support the development of local skills and supply chains to ensure that Welsh people benefit from the zero-carbon transition and in particular as we emerge from the shock of the Covid-19 pandemic. Zero carbon must go hand in hand with a commitment to Foundational Economic renewal.

This Zero Carbon Housing Performance Hub scoping study shows that there is strong support from the housing sector for a Government endorsed body where industry, academia and NGOs can collaborate to share research, debate the issues and help shape future policy. The Hub could therefore become a resource for all similar initiatives to ensure a cohesive and coherent direction.

The Hub will also play its part in enabling a zero-carbon economic recovery that is purposefully aligned with the supply chain in Wales. Importantly for Wales, the Hub will enable the social housing sector to go zero early, bringing the benefits of low energy bills and healthy home environments to those that need them most.

In short, the Hub will help facilitate and accelerate zero carbon high performance solutions that can be rolled-out at scale across all the housing sectors in Wales. We were delighted to be able to fund this scoping study and will give consideration to how we can support its implementation.



Julie James MS

Minister for Climate Change

Executive Summary

In recent years the Welsh Government has given the housing sector in Wales clear indications of its vision for future homes, within the context of the Climate Emergency and a desire to “Build Back Better” following the Covid-19 Pandemic.

The recently published government response to the Review of Part L on energy and carbon standards for new housing in Wales, for instance, envisages a significant ramping up of standards with a “minimum expectation of a 75% improvement option (compared to current Part L 2014 standards) in carbon dioxide emissions for our Part L 2025 standards.”



Llanbedr Dyffryn Clwyd, Ruthin, Denbighshire (Image credit: ClwydAlyn Housing)

In addition, major initiatives such as the Innovative Housing Programme (IHP) and the Optimised Retrofit Programme (ORP) are also driving a period of rapid innovation and progress in the delivery of ultra-low energy and zero carbon homes in Wales. IHP funding this year (2020/21) requires projects to “demonstrate that the scheme is aligned and delivering against the key objectives of social housing building strategy Reimagining Social House Building in Wales” and meets a Design Commission for Wales design review. The result is a clear ambition by the Welsh Government for more social housing built in Wales to use Modern Methods of Construction (MMC), something which the Council Housing Development Forum of eleven developer councils in Wales is responding to with innovative proposals for a funding aggregator and standardised off-site production of zero carbon timber-framed homes.

For social housing in particular there is a growing consensus that this sector can be at the forefront of the journey to zero carbon. This was a key recommendation by the Independent Review of Affordable Housing Supply, chaired by Lynn Pamment: “all affordable homes should be near zero carbon / EPC ‘A’ using a fabric first approach from 2021, with the same goal being set for all homes irrespective of tenure by 2025.” This recommendation is currently being consulted on by the Welsh Government as part of the proposed Mandatory Quality Standards for New Homes.

The Decarbonisation of Homes in Wales Advisory Group has also called for urgent action. In their report *Better Homes, Better Wales, Better World - Decarbonising Existing Homes in Wales*, the Chair, Christopher Jofeh noted “there is real appetite across all parts of Welsh society to tackle the climate emergency. It is right that Wales takes a lead on this issue” and that “no later than 2025, all new homes in Wales must be built to be low carbon, energy and water efficient and climate resilient...All homes built with public sector funding should meet these standards no later than 2021.”

Importantly, it is now widely recognised that all homes in Wales will need to be “zero carbon” or very close to it in the coming years, a fact stressed by the Welsh Government in *Prosperity for All: A Low Carbon Wales*: “if Wales is to meet its climate targets, buildings will need to operate at close to zero emissions by 2050.”

Wales clearly has impressive ambitions for its housing stock and is looking to make concerted progress on the scale and pace of delivery of ultra-low energy and zero carbon homes, linking this transition to wider benefits for health, well-being and the economy, and driving a cultural shift in the way new homes are designed and constructed.

Emerging from this combined thinking is the idea of a “Welsh Zero Carbon Housing Performance Hub” tasked with driving progress on the zero carbon agenda in the residential sector. Woodknowledge Wales has specifically flagged the need to “establish a building performance hub to support the transition to regulations aligned to performance-based outcomes in their report *Zero Carbon Homes: Actions to Integrate our Welsh Forest Industries with Modern Methods of Construction*.”

The creation of a Welsh “Hub” is an exciting prospect and a welcome development. However, there is much preparatory work to do and detail to be developed before such a Hub could be fully operational.

In order to support these critical objectives, North Wales housing association, ClwydAlyn, secured funding from the Welsh Government to explore the potential to establish such a Hub.

This report is the conclusion of a three-month scoping study which brought together the Good Homes Alliance (GHA), Woodknowledge Wales and the Building Performance Network (BPN) to prepare a proposal for what its core purpose could be, how it could add value to the housing sector in Wales, and how it could further the Welsh Government’s objectives.

The report presents preliminary proposals, based on consultations with approximately 90 organisations and individuals within the housing sector.

The scoping work reveals there is industry support and demand for a Hub which is:

- Welsh-based, independently governed, and not-for-profit;
- The primary forum for industry to interact with the Welsh Government on zero carbon housing policy, timelines and funding; and

- Initially focused on the new build social housing sector, then expanding in future years to support private developers, and potentially the retrofit sector if funding allows.

But it is critical to understand that this is a crowded space with well-motivated, highly capable organisations and industry groups. A huge amount of work has already been done on the ultra-low energy and zero carbon homes agenda in Wales and across the UK. The scoping team has actively engaged with or reviewed the work of many such organisations, including the Welsh Home-Grown Homes project, the Decarbonisation of Homes in Wales Advisory Group, The ORP, Constructing Excellence in Wales, the London Energy Transformation Initiative (LETI), the Passivhaus Trust, Woodknowledge Wales, the UKGBC, the IHP, the Council Housing Development Forum Wales, the Active Building Centre, SPECIFIC, and the Construction Wales Innovation Centre.

There is a clear message that much could, and should, be done to look across current activities and initiatives to build a coherent sector-wide programme of work for the Hub that both government and industry can turn to for support. The future Hub should build on this existing body of work, and proactively promote emerging best practice and learning from it.

We therefore propose that the Welsh Government supports the creation of a new Welsh Zero Carbon Housing Performance Hub (a provisional name), established to provide two important services:

- Accelerating the scale of delivery of ultra-low energy and zero carbon homes in Wales, and;
- Providing a transparent, independent, enduring forum for industry and government interaction and collaboration on zero carbon housing policy in Wales.

The Hub would become “the intelligent cog” that links relevant existing government and industry activities. It would have three specific objectives:

1 - Accelerating

We propose a simple and practical step: officially invite Welsh developers to each publicly “pledge” to build a specified and stretching number of well-performing, ultra-low energy or zero carbon homes by 2025. These “Accelerator Projects” would be tracked by the Hub from start to finish, with developers benefitting from tailored support, knowledge-sharing, and promotion of their schemes.

The idea is that working closely with the Hub and its network of experts and funders, would help to unlock some of the barriers organisations might have faced in previous years when planning zero carbon homes. The Hub’s involvement would aim to provide a strong impetus for developers to commit to delivering a substantially larger number of such homes than they have to date, including, for some, constructing their first zero carbon home. The Hub would proactively track the progress of the projects in real time.

Second, the Hub would provide a vital service to accelerate the utilisation of learning and feedback from a range of Welsh initiatives and programmes including the IHP and

the new Hub Accelerator Projects. The team would create responsive, transparent and efficient systems to enable regular interaction between the Welsh Government and industry.

2 - Aggregating

The Hub would aim to improve the affordability of quality zero carbon homes by using newly created Thematic Industry Forums to instigate and connect projects which are exploring innovative ways to aggregate aspects of delivery such as procurement, manufacture of construction systems, and building performance evaluation (BPE) to make them financially viable. The goal is to help developers, including SMEs to achieve economies of scale and cost savings, whilst maintaining quality and performance. Aggregation and scaling should help to reduce cost differentials between zero carbon and standard housing.

The Hub would also use its forums to pool practical knowledge on zero carbon delivery and BPE from the Accelerator Projects, linking organisations with similar experiences and construction approaches and coordinating all of this learning into a coherent strategy for zero carbon homes becoming mainstream.

The outputs of the Hub's forums would inform future Welsh Government policy, consultations and regulatory changes on zero carbon housing.

3 - Assisting

The Hub would aim to improve knowledge, capacity and skills for the delivery of zero carbon homes in Wales. The team would use the Hub's website, events and forums to disseminate cutting-edge research, success stories, innovations, and best practice, for example, on reducing embodied carbon and the use of building performance evaluation. The Hub would add value by identifying knowledge, funding and capacity gaps, recommend future zero carbon policy, training and funding priorities to the Welsh Government, and ideally have involvement in future government zero carbon housing funding decisions and allocations.

Importantly, the Hub would also be the "monitor" of national progress on zero carbon housing delivery, using its findings to inform analysis, for example, on Welsh carbon budgets and planned updates to the energy and carbon housing standards in Part L of the building regulations in 2025.

The scoping consultations indicated strong support for a Hub which is either funded by the Welsh Government entirely or funded by a mix of government and industry. Government funding is considered especially important for demonstrating the official endorsement of the Hub. However, the plan would be to leverage an increasing amount of industry in-kind support, and where possible direct financial support, each year. This is reflected in a recommendation for the Hub to be 90% funded by the Welsh Government in its first year.

We have already seen encouraging signs of industry willingness to provide in-kind support, subject to core Welsh Government funding being committed. An example being the offer of office space in Year 1 in Swansea and North Wales, jointly estimated to be worth between £15,000 to £20,000. We are also confident that other core requirements, such as setting up

the legal entity and annual accounting systems, are likely to be sponsored or offered by industry.

The founding vision for the Hub must also go beyond these initial years. Once operational, the team will be well placed to demonstrate the unique position of the Hub and its value to the housing sector in Wales.

In conclusion, we recommend that a Welsh Hub is established, with every effort made to have it up and running as soon as possible. The aim would be for governance structures to be in place by Autumn 2021 with the Hub fully operational by the end of the year.

Examples of Industry Support

"ClwydAlyn is committed to developing high quality affordable homes to meet local needs across North Wales. As part of our mission to beat poverty, ensuring that homes are built to the highest environmental standards that tenants can afford to heat well continues to be a key priority, as well as enabling us to play our part in meeting challenging national low carbon targets. The Hub will be really important in facilitating collaboration, sharing good practice and testing and reviewing the performance of different technologies and approaches, and this is a great step forward for the sector in achieving a low carbon future."

Craig Sparrow, Executive Director of Development at ClwydAlyn Housing

"Wales has a long and strong legacy of innovation in the sustainable housing sector, but to help accelerate and scale that, a Welsh Zero Carbon Hub for homes seems to be the missing piece of the puzzle. At the Active Building Centre we're involved in and aware of many pockets of excellent practice, but we now need to replicate those good works and scale zero carbon housing delivery across the nation. The Hub could act as the glue to draw together and enhance national and local policy with progressive supply chain partners and the already-excellent grass roots delivery of low carbon homes."

Simon McWhirter, Head of Engagement, Active Building Centre

"If we're going to tackle the climate energy, then we need collaboration to drive impactful change towards a more sustainable future. The prospect of establishing a Zero Carbon Housing Performance Hub in Wales is another important step to achieving net-zero targets for homes. As a proud partner of the Good Homes Alliance, we look forward to contributing to the scoping study and helping to shape the role the hub could play in lowering carbon emissions in communities across the country."

Mark Robinson, Group Chief Executive, SCAPE

"The Hub will provide a single source of applied solutions that are accessible to all councils. Rapidly upscaling the supply of market, general needs and supported homes on council owned sites is now and will remain an urgent priority. How to do so at pace and in ways that promote off-site manufacture, the new Future Homes Standard and deliver dividends to Wales' timber industry should not be left for councils themselves to strive towards individually. The Hub will help achieve shared learning via real demonstrator projects. If the Hub can have a role throughout Wales, this will help to ensure that a whole generation of exemplar housing schemes are visible to all players in the supply chain – helping to drive out change for the better."

Anonymous (Affordable Housing Specialist)

“As a sector we are beginning to better understand the potential benefits of using Modern Methods of Construction (MMC) for new-build social housing. WPA are passionate about MMC. We firmly believe that the offsite housing manufacturers can play a huge role in delivering the quantity and the quality of homes that are required to meet the future needs of the social housing sector in Wales, not least regarding the Zero Carbon agenda. The challenge now is to ensure that the progress made in recent years continues and that what was revolutionary becomes the normal. The Welsh Zero Carbon Hub will help ensure that the progress made in recent years by individual organisations inspires others to do the same.”

Neil Barker, Director, Welsh Procurement Alliance

“Denbighshire County Council declared a Climate Change and Ecological Emergency in July 2019 and aims to become a Net Carbon Zero Council by April 2030. The creation of a Zero Carbon Hub will help us to access the knowledge required to develop new council homes which make a contribution to meeting this commitment.”

Mark Dixon, Programme Manager, Housing Development, Denbighshire County Council

“The Construction Wales Innovation Centre (CWIC) are pleased to support the proposal to create a Welsh Zero Carbon Hub. This hub could contribute a vital service to the construction sector in Wales, linking together the core pillars of Research & Development, Prototyping and Skills & Training to offer a pan-Wales coordinated solution that will allow for an accelerated future growth of the net-zero built environment in Wales. CWIC’s past work within Skills, Training and Knowledge Transfer has proven that a coordinated pan-Wales network of collaborators can successfully drive forward innovation within the sector. It is important that the proposed Hub builds on the foundations laid by us, and other exemplar projects, seeing Wales lead the way in the mobilisation and achievement of Net-Zero Targets.”

Gareth Wyn Evans, Head of Construction Wales Innovation Centre

Ecology Building Society is a building society with a mission to build a greener society. We provide mortgages and development finance to individuals, charities, businesses and community-led organisations to support sustainable construction and renovation, across England, Wales, Scotland and Northern Ireland. Decarbonising the housing sector is an important and complex challenge, requiring deep collaboration, knowledge exchange and innovation across the sectors – finance, business, policy, research and the public. The challenge is urgent, with deep cuts in carbon emissions required in the coming decade to avert dangerous climate change. Creation of a Welsh Zero Carbon Hub will fulfil a much-needed integrative approach, catalysing and accelerating new approaches to the provision of sustainable housing in response to the climate emergency.

Alison Vipond, Sustainability Policy and Innovation Lead, Ecology Building Society

Who is this Report For?

This scoping report is primarily intended for ClwydAlyn. Funding has been received via the Welsh Government's Collaborative Research and Innovation Support Programme (CRISP).

However, we anticipate the final report will be of interest to a wider audience of local authorities, advisory bodies, social housing providers, private developers, researchers, building professionals, trade associations, the building supply chain, training and skills providers, financiers, warranty providers, insurers and others.

Method

In summary the scoping team carried out the following tasks:

- Surveyed 73 organisations (online) about the type of Hub they would like to have. See a summary of the results in Annex A;
- Interviewed 15 individuals in more depth about their views on the potential role of the Hub and corporate support they could provide.¹ See an anonymised summary of the interviews in Annex C;
- Ran a workshop with Welsh local authorities and housing associations, summarised in Annex C;
- Conducted a literature review of relevant Welsh and UK policy and regulation, research, best practice guidance, and case studies. See the review in Annex B;
- Consulted with key officers and programme representatives within the Welsh Government; and
- Attended relevant events, meetings and general one-to-ones.

The findings from the interviews, workshop and survey have been generalised and anonymised.

¹ Note that a number of the organisations interviewed also completed the online survey.

Acknowledgements

The scoping study team would like to thank everyone who responded to the survey and the following organisations for their feedback during the interview and workshop process:

Adra	MAN GPM
Arup	Monmouthshire Building Society
Cartrefi Conwy	Nationwide Building Society
ClwydAlyn	North Wales Housing
Constructing Excellence in Wales	Principality Building Society
Construction Wales Innovation Centre	Redrow Homes
Denbighshire County Council	Sero Homes
Ecology Building Society	Welsh Procurement Alliance (WPA)
Flintshire County Council	Wrexham County Council
Grŵp Cynefin	Ynys Môn County Council
Local Partnerships	

This report was produced with the support of the following team:

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Richard Broad, Good Homes Alliance
Larry Tate, Good Homes Alliance
Julian Brooks, Good Homes Alliance
Tessa Hurstwyn, Hurstwyn Associates

Structure of the Report

The report has four sections:

- Section 1 – The Proposal. This is the team’s preliminary view on what the Hub should do. Its core purpose and objectives;
- Section 2 – The business case for a new Hub. What problems the Hub would help to solve and how;
- Section 3 – Delivery and governance. What type of entity the Hub could be; and
- Section 4 – Practicalities. How the Hub could be set up.

For simplicity and brevity, each section is written in a “question and answer” style. This approach also allows us to add to the document with new questions and answers as they arise over the coming months.

Terminology

Throughout the rest of this report we frequently use the term “zero carbon homes” as a catch-all term to cover “net zero carbon homes”, “net zero whole life carbon homes”, and “ultra-low energy homes”.

There are already a range of energy and carbon standards which housing associations, local authorities, and private developers work to when looking to push beyond current building regulations. Our approach is to view all such standards as getting Wales on the journey to zero carbon.

We do however agree with many of our colleagues, that whatever standard is formally adopted by the Welsh Government in the future, it will need to have certain key elements, including a focus on reducing operational energy use, reducing embodied carbon, increasing the use of renewable energy, potentially off-setting carbon emissions, and monitoring and verifying the actual performance of buildings. There is more on this subject in Q 4.10.

Immediate Next Steps

We would welcome ClwydAlyn and the Welsh Government’s comments on the report before a public version is prepared for launch later in May 2021, particularly with respect to any sensitivities.

It is proposed that the publication of the report is used as an additional means of consultation with stakeholders. We would invite comments on the content – including on the “Accelerator” concept. See Question 1.6.

We would also envisage using the report as an opportunity to invite developers and other organisations to take part in and show support for the Hub’s future activities, including:

- Attending the scoping study virtual launch event;
- Being a potential sponsor/funder/help-in-kind;
- Being a potential venue/office provider (ClywdAllyn and Active Building Centre have already offered this facility);
- Working for the Hub/member of the Board;
- Taking part in the detailed work of the Hub on zero carbon housing themes once operational; and
- Joining the mailing list.

Section 1 – The Proposal

Q 1.1 What should the core purpose of the Hub be?

Our consultations so far with the Welsh housing community suggest that the Hub would provide significant value for Wales and Welsh housing providers by carrying out two important services:

- **Assisting with accelerating the scale of delivery of zero carbon homes in Wales.** The Hub should help to substantially drive up the number of zero carbon homes being delivered in the run up to 2025 – in preparation for a step change in national housing energy and carbon standards in the future. Preparing the sector and starting to scale up now is the only effective way to be ready, both in the terms of being assured of having the capacity to deliver large numbers of quality zero carbon homes in the near future, and delivering in a way that benefits from economies of scale, with associated reductions in build costs and security of local supply chains. Achieving scale is of course the “holy grail”. Below we set out a simple proposal for how the Hub could contribute soon after launch.
- **Providing a transparent, enduring and dedicated forum for industry-government interaction and collaboration on zero carbon housing policy in Wales.** There is an ever-growing number of impressive housing energy and carbon-related projects and programmes in Wales, all intended to drive action on zero carbon homes and encourage innovation. The IHP, for example, has seen much success since its launch in 2017, funding over 60 projects so far to 2020.² And the ORP, running since late 2020, will see thousands of homes across Wales “upgraded well, at an optimised cost.”³ For the Hub to be truly effective, it should have a central role in reviewing and showcasing the detailed and practical outcomes from such projects, finding synergies between them, and drawing on their combined experiences and results to inform future zero carbon housing policy. The Hub would act as bridge between industry and the Welsh Government.

Our recommendation is therefore that the Hub has these two activities as its core purpose.

Before expanding further, we discuss our recommendations for which sectors of the Welsh housing community the Hub’s remit would cover.

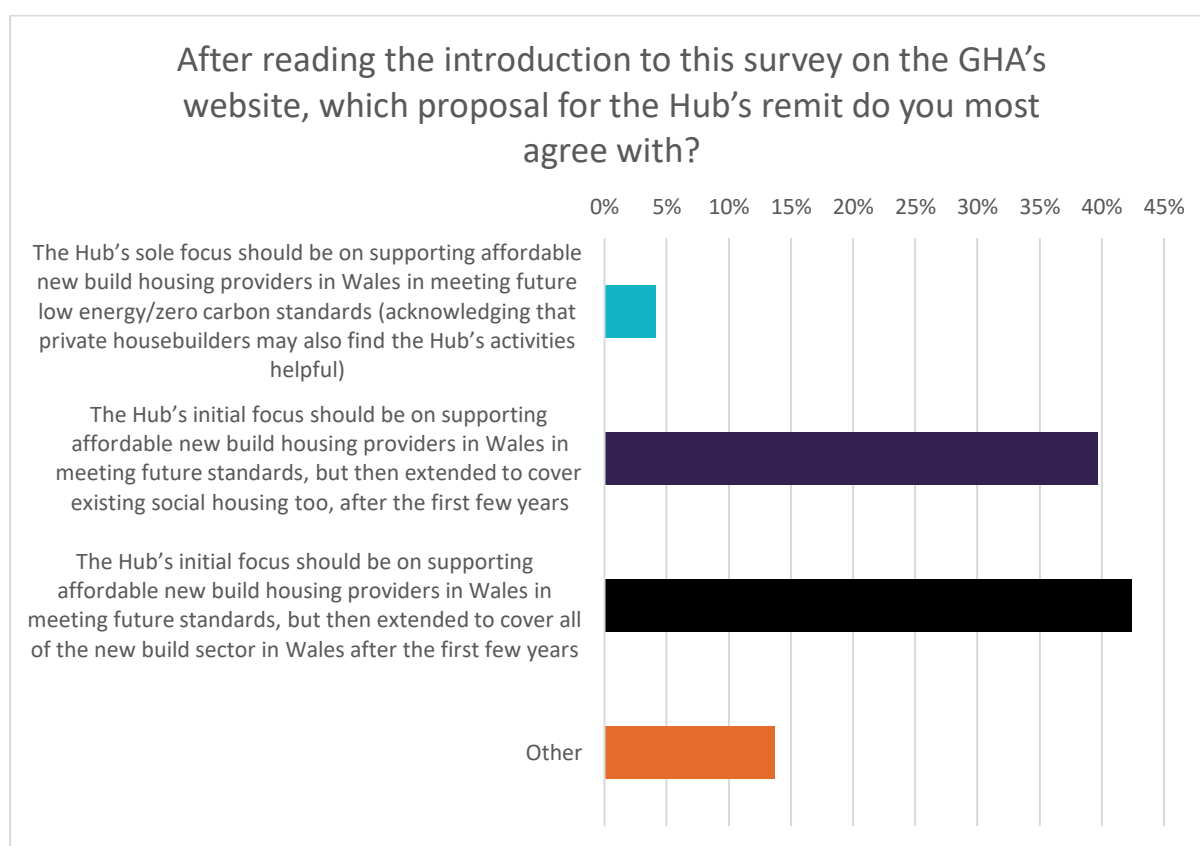
² See [Innovative housing programme | GOV.WALES](#)

³ See [Written Statement: The Optimised Retrofit Programme 2020-21 \(6 November 2020\) | GOV.WALES](#)

Q 1.2 Which housing sectors should the Hub's remit cover?

The results of our survey suggest that support for the delivery of zero carbon homes in the new build social housing in Wales should be the initial focus for the Hub.

Views were then split on whether, after the first year or so, the should extend to cover all of the new build sector in Wales (i.e. all social housing and private developers), or instead extend to cover the upgrading of existing homes in the social housing sector.



Our view is that the Hub could and should, if possible, cover all three sectors in Wales, but stagger its focus, support and resources as follows:

- 2021/22: Affordable new build housing providers (social housing and developer local authorities);
- 2022/23: + Private developers; and
- 2023/24: + potentially, the upgrading of existing social housing.

Survey comments:

"Consideration of the viability of covering all new build and all existing homes in Wales should be an early Hub workstream."

“The ‘new build’ and ‘existing’ challenges are distinct. There is overlap, but the Hub's work might be more effective if focused on one or the other.”

The scoping project brief was also clear that the Hub should be concerned with scaling up the delivery of ultra-low energy and zero carbon homes. Scale and pace is a big theme.

There is also a strong desire for the Hub to assist with driving the delivery of zero carbon homes which perform in reality as close to their designs as possible. Working with other organisations including the BPN, the Hub should have a strong focus on this area. See more in Question 1.12.

Overall, this means that the scope of the Hub's activities would first and foremost be about energy and carbon performance in housing. We also strongly recommend that a “measurement and verification” workstream covers the monitoring of indoor environmental performance to ensure the health and well-being of occupants is protected.

More detail is provided on proposed workstreams in Section 4.

Q 1.3 Based on the core purpose outlined above, what should the Hub's objectives be for the first three years?

We believe the Hub must avoid attempting to duplicate existing trailblazing technical work on zero carbon definitions for housing and on best practice design, developed by organisations such as the former UK Zero Carbon Hub, the Passivhaus Trust, UKGBC, LETI, Woodknowledge Wales and others.

Instead, the Hub would add the greatest value and align best with its core purpose by doing three things:

- 1) **Accelerating.** Accelerate the scale and pace of delivery of "zero carbon" homes in Wales. We propose a simple and practical step: officially invite Welsh developers to each publicly "pledge" to build a specified and stretching number of well-performing, ultra-low energy or zero carbon homes by 2025. These "Accelerator Projects" would be tracked by the Hub from start to finish, with developers benefitting from tailored support, knowledge-sharing, and promotion of their schemes.

The idea is that working closely with the Hub and its network of experts and funders, would help to unlock some of the barriers organisations might have faced in previous years when planning zero carbon homes. The Hub's involvement should provide a strong impetus for developers to commit to delivering a substantially larger number of such homes than they have to date, including, for some, constructing their first zero carbon home. The Hub would proactively track the progress of these projects in real time. See more in Question 1.6.

Second, the Hub would provide a vital service to accelerate the utilisation of learning and feedback from a range of Welsh initiatives and programmes including the IHP and the new Hub Accelerator Projects. The team would create responsive, transparent and efficient systems to enable regular interaction between the Welsh Government and industry. For example, the Hub could:

- Dramatically increase the speed at which new housing schemes share emerging best practice via live “Accelerator Project tracker blogs” and site-based webcams on a sample of projects during the construction phase; and
- Facilitate regular ‘Best Practice Bootcamps’ between Accelerator Project developers to promote rapid sector wide innovation and skills development.

- 2) **Aggregating.** The Hub would aim to improve the affordability of quality zero carbon homes by using newly created Thematic Industry Forums to instigate and connect projects which are exploring innovative ways to aggregate aspects of delivery such as procurement, manufacture of construction systems, and BPE to make them financially viable. The goal is to help developers, including SMEs to achieve economies of scale and cost savings, whilst maintaining quality and performance. Aggregation and scaling should help to reduce cost differentials between zero carbon and standard housing.

The Hub would also use its forums to pool practical knowledge on zero carbon delivery and building performance evaluation from the Accelerator Projects, connecting organisations with similar experiences and construction approaches and coordinating all of this learning into a coherent strategy for zero carbon homes becoming mainstream.

The outputs of the Hub’s forums would inform future Welsh Government policy, consultations and regulatory changes on zero carbon housing.

- 3) **Assisting.** The Hub would aim to improve knowledge, capacity and skills for the delivery of zero carbon homes in Wales. The team would use the Hub’s website, events and forums to disseminate cutting-edge research, success stories, innovations, and best practice, for example, on reducing embodied carbon and the use of BPE.⁴ The Hub would add value by identifying knowledge, funding and capacity gaps, recommend future zero carbon policy, training and funding priorities to the Welsh Government, and ideally have involvement in Welsh Government zero carbon housing funding decisions and allocations.

Importantly, the Hub would also be the “monitor” of national progress on zero carbon housing delivery, using its findings to inform analysis, for example, on Welsh carbon budgets and planned updates to the energy and carbon housing standards in Part L of the building regulations in 2025.

⁴ See Annex B, the scoping study literature review.

Q 1.4 What should the Hub's specific KPIs be?

In light of the above our proposal is for the Hub to have the following type of key performance indicators. These will need to be refined with developers as an early Hub activity, for example, checking that target dates are feasible.

Accelerating

- At least 50% of all Welsh developers make a pledge with the Hub to deliver a substantial increase in the proportion of their new homes built to an ultra-low energy or zero carbon standard and to meet this target by 2025 (or be close to meeting it);
- At least 80% of small social housing developers⁵ in Wales will have built at least one new/additional ultra-low energy or zero carbon home by 2025 (whether on an individual basis, or through a form of market/delivery aggregator);
- At least 80% of small private housing developers in Wales will have built at least one new/additional ultra-low energy or zero carbon home by 2025 (whether on an individual basis, or through a form of market/delivery aggregator);
- At least 90% of larger social housing developers will have built at least one new/additional multi-unit scheme to an ultra-low energy or zero carbon standard by 2025 (whether on an individual basis, or through a form of market/delivery aggregator); and
- At least 90% of larger private housing developers will have built at least one new/additional multi-unit scheme to an ultra-low energy or zero carbon standard by 2025 (whether on an individual basis, or through a form of market/delivery aggregator).

The aim would be to discuss these goals with a small number of developers before the launch event and invite them to agree in principle to submitting a pledge as proof of concept.

Through these goals the Hub would become a zero carbon homes “accelerator” for Wales.

Aggregating

- By 2025 Hub activities to promote and support aggregation projects, plus the identification and initiation of new aggregators, results in a tangible reduction in the percentage difference in the cost of building zero carbon homes compared to “standard” homes.

⁵ “Small” would align with the Welsh Government’s definition of an SME.

Assisting

- When surveyed, at least 90% of Hub users agree that engagement with the Hub has improved their knowledge and skills relating to zero carbon building;
- The Welsh Government indicates satisfaction with the information shared to inform policy and regulatory updates; and
- A live Welsh “national zero carbon housing progress tracker” on the Hub’s website indicates tangible progress on key metrics between 2022 and 2025, including the number of Accelerator Projects, the total number of Welsh zero carbon homes, and Welsh housing sector carbon emissions and energy use reductions.

Governance

- The Hub would publish an annual report to transparently update on its activities and performance, including progress on raising industry funding.

Q 1.5 Why aim for a minimum of just one zero carbon unit or scheme?

It is anticipated that not all developers will have had experience of building zero carbon homes yet, especially to the newer best-practice frameworks developed by organisations such as the UKGBC, LETI and Woodknowledge Wales.

Therefore, the goal is to support these developers in taking a first step. For others, making a commitment to commence construction of hundreds of zero carbon homes across multiple sites may be well within reach.

The idea is that the Hub would agree a challenging yet feasible pledge with each developer, and then track those projects in real time, acting as a sounding board as issues arise.

Assuming that roughly 7,400 new homes in total are completed in Wales each year between 2022 to 2025, meeting the Welsh Government’s latest central estimate of housing need⁶, if just 10% of these were built to an ultra-low energy or zero carbon standard, that would mean around 3,000 additional cutting-edge, future-proofed homes.

Q 1.6 How would the “accelerator” work in practice?

The following hypothetical example illustrates how we believe the accelerator idea could work. Again, the details would need to be refined in consultation with the developers who would be using the service to ensure it meets their needs.

⁶ See [Estimates of housing need: 2019-based | GOV.WALES](#)

Housing Association A is officially invited to take part in the Welsh Hub's "Zero Carbon Accelerator" in Autumn 2021, along with other affordable housing developers operating in Wales.

Housing Association A already plans to build 1,000 new affordable homes for rent, shared ownership or sale between 2021 and 2025. They estimate that 400 of these units do not have finalised designs and are due to have started on site before the end of 2022, and therefore have the potential to be included as an Accelerator Project. The Association has done one low energy development of 15 units already and is looking to start to scale up and offer more of these types of homes to their tenants. Management sees the benefits of reduced maintenance requirements, lower, stable energy bills, and the achievement of the organisation's wider climate change objectives.

After internal discussions and consultation with the Hub, Housing Association A decides that a target of around 20% of their 400 units is appropriate, equating to 80 zero carbon homes. These homes would be built across three sites in the same region of Wales, with one scheme starting in 2021 and the other two in 2022. Each site will see all the units brought up to the required standard, rather than having exemplar projects dotted across many sites.

Housing Association A also decides that at each site they will use the same energy/carbon standard, procurement approach and construction model in order to build up their expertise and supply chains, meaning economies of scale can be achieved.

Prior to consulting with Housing Association A, the Hub has created a light-touch, template for Accelerator Project participants to complete at the early stages of the exercise. This would gather preliminary information about the planned schemes, potentially including high-level information about:

Template example

- The low energy/zero carbon standard to be adopted and why
- The total number of homes to be constructed to the standard
- The site e.g. number of sites, location, units per site, house types, and construction type
- Description of any general concerns and issues (some of which the Hub might be able to assist with, others can be noted for annual reporting purposes)
- Funding approach and any sources of funding obtained or applied for
- Procurement/supply chain approach
- Target levels for the total operational energy use of each unit/house type
- Target levels for the space heating for each unit/house type
- Target levels for the embodied carbon for each unit/house type
- Targets for renewable energy generation for each unit/house type
- Strategy for off-setting any remaining carbon emissions and the amount expected to be off-set
- Strategy for monitoring and verifying energy, carbon and indoor environmental performance
- Other key features of the approach e.g. storage, smart controls

- Estimated carbon emissions avoided compared to if the schemes(s) were built to Part L 2021
- Estimated energy use avoided compared to if the schemes(s) were built to Part L 2021
- High-level ventilation strategy
- High-level overheating mitigation strategy
- Potential technical issues envisaged
- Potential legal issues e.g. insurance and warranties
- If appropriate, cost estimates

A Hub “Project Officer” would track and record the progress of the three schemes at agreed points from the early stages through to completion, handover and performance evaluation. By tracking in this way, the Hub would help to ensure the pledges are met as far as possible, and that opportunities to showcase the projects in Wales and the UK are taken.

Any general issues which the Hub observes across schemes would be brought to the Thematic Industry Forums and highlighted in an annual report, which would be shared with the Welsh Government.

It must be made clear that the Hub’s role in the Accelerator Projects is not to act as an official verifier or advisor to the schemes. For example, if a Passivhaus scheme were being built, trained Passivhaus certifiers and building performance evaluation experts would perform such a role.

Q 1.7 Why push for “zero carbon homes” to be delivered before the Welsh Government has defined a standard or made it law?

It is anticipated that the new build housing sector in Wales will wish to be as prepared as possible for the introduction of a form of zero carbon standard being made mandatory by the Welsh Government, potentially from 2025 when the next major update to Part L is due to take place, and certainly before 2030.

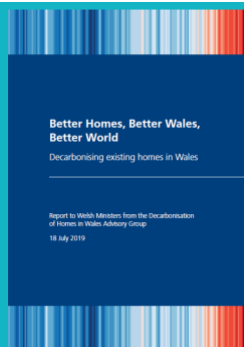
As noted, the Welsh Government recently published its response to the consultation on Part L of the building regulations, relating to energy and carbon standards for housing. This confirms the Government’s intention for 2025: “Although the final dwelling specification to set the target for the 2025 notional dwelling will need to be reviewed closer to the date, industry should note that given the increased urgency to tackle climate change, we plan to start the next Part L review in 2023 with the minimum expectation of a 75% improvement option (compared to current Part L 2014 standards) in carbon dioxide emissions for our Part L 2025 standards.”⁷

The response indicates that “some of the respondents believed that given the climate emergency and national targets, all new building should be net zero or, where possible,

⁷ See [summary-of-responses-building-regulations-part-l-review.pdf \(gov.wales\)](https://gov.wales/summary-of-responses-building-regulations-part-l-review.pdf)

energy positive.” It is therefore possible that in the run up to 2025 changes are made to the regulatory landscape to bring in key elements of zero carbon frameworks, such as provisions on in use performance, “unregulated” energy or embodied carbon. In addition, as acknowledged by many, developing “zero carbon ready” homes now will save on retrofit costs in the future. Plus, social housing providers are also likely to need to prepare to meet new, more stretching - mandatory energy and carbon-related design standards sooner - from 2021. These standards are currently being consulted on and might take the form of an EPC “A” target for new build.

It is fully expected that some developers will continue to choose to go beyond national standards or operate to faster timelines on a voluntary basis – and should be encouraged and supported in doing so.



“There is real appetite across all parts of Welsh society to tackle the climate emergency. It is right that Wales takes a lead on this issue.”

Better Homes, Better Wales, Better World – Decarbonising Existing Homes in Wales, Decarbonisation of Homes in Wales Advisory Group, 18 July 2019

Lastly, and importantly, our consultations suggest that the best way to deliver low energy and zero carbon homes at prices which are reasonably comparable to current homes is to drive delivery at scale now. Scaling needs to start well in advance of possible legislation otherwise there is a major risk of quality and supply chain issues.

Q 1.8 What would count as an ultra-low energy or zero carbon home for the purposes of the Accelerator Projects?

A key question for the scoping study has been whether the Hub should set out to define in detail a “zero carbon” standard for Wales, performing a similar role to the former Zero Carbon Hub in England.



“In relation to a moving towards zero carbon housing, it is important to clarify what is meant, as people often talk about ‘zero carbon’, but sometimes they mean ‘almost zero carbon...’

Independent Review of Affordable Housing Supply
April 2019

Our preliminary recommendation, based on the survey results and interviews, is that attempting to create another definition of zero carbon is not where the Hub would add most value. It could even be counter-productive.

As noted, there has already been very detailed work undertaken by the UKGBC, LETI and Woodknowledge Wales in recent years to define zero carbon frameworks. There are also, of course, a number of well-established and effective low energy building standards including the Passivhaus standard, which has already seen the creation of over 1,375 homes across the UK which generally have very efficient fabric, ultra-low space heating demand, and excellent in use performance and are therefore likely to be classed as “zero carbon ready”. Similarly, Wales is seeing some really innovative zero carbon housing schemes being developed which have followed the “active buildings” concept.



The Welsh Government wants to “see greater energy efficiency in buildings and appliances, and the use of new building fabrics turning buildings into power stations...more than 26 full-scale demonstrator sites incorporate various aspects of the active buildings concept...”

Prosperity for All: A Low Carbon Wales (Low Carbon Delivery Plan),
Welsh Government, 25 March 2019

Our view is that, at this stage, the Hub should be a champion for all types of ultra-low energy and zero carbon projects in Wales, following their journey and proactively learning from and disseminating information from each one.

By encouraging the scale up of delivery to any of these standards now, and prior to an official national standard coming into force, Wales would use less energy and generate fewer greenhouse gas emissions from the buildings sector rather than by waiting for a consensus standard to be created down the line.

This approach also gives developers the freedom to use the standards or approaches they are most comfortable with, most effective in their view, and which best fit their business model.

However, as described in Question 1.6, each Accelerator Project would be asked, amongst other information, to summarise the following for each of their schemes:

- Target levels for the space heating and total operational energy use for each unit/house type;
- Target levels for the maximum embodied carbon for each unit/house type;
- Targets for the amount of renewable energy generation for each unit/house type;
- Strategy for off-setting any remaining carbon emissions and the amount expected to be off-set; and

- Strategy for monitoring and verifying energy, carbon and indoor environmental performance.

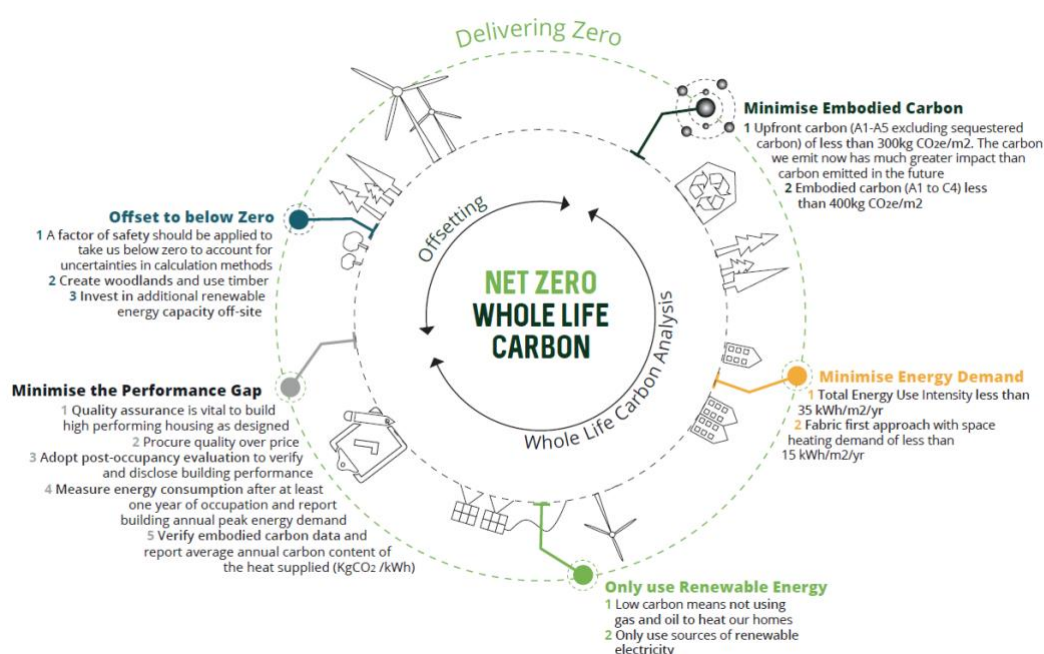
These five elements are key areas for focus for any future homes which are zero carbon in design and zero carbon in reality. The elements are recognisable as the basis of the UKGBC, LETI and Woodknowledge Wales frameworks.

Hence, we are recommending that the Hub does not adopt a single zero carbon definition initially, and also that it does not set out to define another new standard itself at this stage.

Instead, the Hub would track in detail new housing schemes which are pushing the boundaries, inviting Accelerator Project participants to think in more detail about each of the five elements above, and decide what they plan to do against each.

The Hub would therefore be agnostic on construction approaches but would still aim to highlight the particular benefits observed by developers of the approaches they have chosen. For example, a developer choosing a timber system manufactured off-site might have done so having in mind affordability, future potential embodied carbon targets, the Welsh Government's recent communications about the benefits of using Welsh timber and local supply chains, and research into the in use performance of a number of timber schemes in Wales demonstrating good results.⁸

Figure 1 - illustration of the zero carbon framework developed by Woodknowledge Wales in 2020, building on work by the UKGBC and LETI.



⁸ See [Zero Carbon Homes—Zero Carbon Timber Solutions for Wales - Woodknowledge Wales](#)

Q 1.9 Would the Hub still seek to influence the shape of the future Welsh zero carbon housing policy?

Yes. There would be a wealth of information coming from the new Accelerator Projects and broader Thematic Industry Forums. All of this can be shared with policymakers, with permission and anonymised as necessary, on an official basis and in a systematic and timely way.

As a result, the developers working with Hub would have a direct and established means of raising issues with the Welsh Government and helping to shape policy.

The Welsh Government would also benefit from considered feedback from real housing projects, packaged in a way that fits well with policy development cycles and processes.

Q 1.10 Is there a risk that developers will practice delivering ultra-low energy and zero carbon homes in the run up to 2025, only then to find that the Welsh Government's future standard is different?

As stated above, the Welsh Government recently published its response to the consultation on Part L of the building regulations. This confirms the Government's intention to require new housing to meet carbon emissions targets in 2025 that are at least 75% tougher than the 2014 standard.

However, as noted there will be an official review commenced in 2023, providing an opportunity for changes. Especially as the response indicates that "some of the respondents believed that given the climate emergency and national targets, all new building should be net zero or, where possible, energy positive."

Hence, it is expected that a zero carbon standard of some form will come, applicable to all new housing and informed by the Hub's work. The Welsh Government has also hinted that policies intended to reduce embodied carbon in new build housing will be coming soon.⁹

In order to see a smooth transition from delivery of a relatively small number of zero carbon exemplar projects, to mandatory delivery at scale, developers will need to have trialled their processes, gained skills and knowledge, prepared their supply chains and ironed out technical issues as far as possible. The Hub would provide support and would also aim to work with the Welsh Government to gain early insight on potential policy developments that could have a major impact a developer's zero carbon strategy – including on embodied carbon and off-setting.

Whatever national standard is adopted it is anticipated that it would need to have at least some or all of the 5 elements discussed in Question 1.8, and therefore that the Hub

⁹ See <https://www.cewales.org.uk/events/details/F769830E-87D5-6A21-5E1A-362FC1B0A166/>

Accelerator Projects would benefit most by reporting on progress against each of these, no matter what official standard they are working to.

Q 1.11 How would the quality of the Accelerator Projects be assured – not quantity only?

As stated, part of the Hub's role would be to collect information about Accelerator Projects and ask questions about a range of relevant themes – one of which would be on quality assurance.

To illustrate, some of the Accelerator Projects might be part-funded by the Welsh Innovative Housing Programme (IHP), or its successor. Like any such project it would need to adhere to building regulations, the IHP criteria and any other relevant social housing design standards.

The Hub would not try to re-define what those standards should be but would interview the developers in question over the course of the project – on a one-to-one basis - to understand in some detail what their delivery model is/was and how they intend to go about meeting standards.

The Hub would collect information about successes, and any issues and learning arising relating to quality assurance. This could be anything from defining who is accountable for different areas of compliance, warranty issues, performance monitoring issues, issues with skills and training, through to technical areas such as reducing the potential for thermal bridging.

The Passivhaus framework, for example, has achieved many successes due to its emphasis on attention to detail and quality checks at every stage of the construction process. If for instance, a housing association has decided it will pledge to start 15 Passivhaus units before the end of 2022, the scheme(s) would of course need to adhere to all aspects of the Passivhaus framework. The Hub would record that this project is taking place, collect the basic information about it, and would over the following years seek to get into the nitty gritty of how the build has gone, including the quality assurance processes used.

The Hub team would be tracking the project in real time, keeping records and collecting any data the developer is willing to share. The Passivhaus Trust might then decide to produce a case study to showcase the project, and the Hub could share information with the Passivhaus Trust to assist with that process, adding the case study to the Hub's Accelerator record once complete.

We do not envisage the Hub having a technical QA or advisory role and it would not give technical advice on particular projects.

Q 1.12 How does the proposed approach deliver of the aim of improving in use performance?

The Hub would:

- Showcase how projects being tracked are measuring and verifying real performance;
- Identify and help developers to overcome barriers to effective BPE; and
- Identify which construction approaches and quality assurance processes are resulting in especially small “performance gaps”.

In terms of the first bullet point, similar to Question 1.11 on quality assurance, the Hub would be in an observer role.

For example, a local authority may have pledged to start building 100 ultra-low energy homes by the end of 2021. As above, the pledge would be recorded, basic information collected, and the progress of the project followed.

One of the questions the local authority would have been asked to provide information on is what its plans are for monitoring the performance of the units. The precise set of questions might vary from project to project but could include questions about which aspects of performance will be checked or monitored, whether the project will follow any specific Building Performance Evaluation (BPE) process, guidance or standard, who will be doing any monitoring and over what period, what equipment will be used, what the results of any monitoring are (if they, as developer, are willing to discuss this), and how the results will be used.

By asking these simple questions the Hub would be encouraging a focus on BPE and could also assist developers by putting them in touch with relevant experts, sharing guidance on best practice, and listening to any issues they have with a view to helping to find collective solutions for the wider community.

This work could be of particular significance for smaller developers for whom the cost of BPE is likely to be especially challenging. The Hub might be able to assist with aggregating BPE work for smaller developers so that contracts are let for multiple projects on a confidential basis, reducing costs for individual schemes and ensuring coherent and comparable approaches to measurement and verification.

The second and third bullets would be delivered by a “Housing Performance Forum” set up by the Hub, tasked with collating or signposting UK best practice, on BPE, feedback from Welsh programmes and initiatives, information and data from Hub projects, and identifying opportunities, issues, policy questions, and funding and research priorities. The forum will also have the potential to commission a relevant research project.

See more on the proposed Hub Forums in Question 4.4.

Q 1.13 Would the Hub support the use of MMC and off-site construction?

Yes, all types of construction approaches delivering zero carbon homes would be supported. As mentioned, there is an expectation by the Welsh Government and many in the Welsh housing community that the use of MMC and off-site construction will play an increasingly

important role in meeting the types of holistic, whole life carbon standards developed more recently by industry colleagues.

Our interviews and survey suggest that this is a commonly held vision. However, there is also a clear signal that people expect an organisation with a strategically significant role, such as the proposed Hub, to maintain an agnostic approach when supporting innovation and Accelerator Projects.

Notwithstanding this impartial stance, discussions with several financial organisations have identified a significant interest in creating collaborative partnerships to help MMC and off-site innovations be used in future housing projects, which would include Hub Accelerator Projects. These organisations are particularly keen to get a better understanding of:

- How different MMC construction systems require different phasing of capital release during the delivery process (i.e. more upfront cost to build panels/systems in a factory before they arrive on site);
- How to formalise the risk assessment of such innovations when offering new financial products; and
- How to access and analyse real world BPE data to understand how such systems influence the energy costs occupants experience.

A number of Thematic Industry Forums for developers are those using similar construction approaches, including on MMC and off-site, building with timber, or traditional construction.

Research Pilot Proposal - MMC net zero affordable and supported homes in Wales. Jointly owned by Local Partnerships, HM Treasury, The Local Government Association and the Welsh Government.

The proposal identifies that “Wales lacks sufficient supply of both affordable general needs homes and specialist supported homes for single adults with a range of vulnerabilities...Wales has ambitions to develop the use of MMC by the public sector as a route to greater prosperity, improve productivity and reduced carbon impacts. Wales intends to develop its wood economy and needs to increase the volume of supplier order books (particularly for construction grade timber) if these economic and environmental goals are to be achieved. A public sector owned and controlled applied delivery mechanism could accelerate the rate at which timber based MMC net zero homes are provided on infill public land sites to meet local need. A pilot programme is proposed within a single Regional Partnership Board (RPB) area, spanning the administrative areas of several councils, to test the efficacy of and role for a new public sector delivery mechanism...”

Q 1.14 Would the Hub support the use of timber for building?

Yes, similar to Question 1.13, all types of construction approaches would be supported. The Hub would maintain an agnostic approach to construction systems and technologies when supporting innovation and Accelerator Projects.

Whilst respecting and supporting this viewpoint, it is acknowledged that through recent strategies and the IHP programme the Welsh Government has shown a clear intention to support the growth of the timber construction industry for multiple reasons, including to drive reductions in embodied carbon. Therefore, it is also important for the Hub to provide an enduring “home” for such projects, building on the Home-Grown Homes programme, keeping its success stories and research findings alive and in view, alongside support for other construction approaches to zero carbon.

We expect to see future Hub Accelerator Projects using a variety of innovative construction approaches and solutions, as has been seen in the IHP projects, and this should enable a better understanding of which types represent promising options for mainstream zero carbon housing.

Q 1.15 Would the process of supplying information about Accelerator Projects duplicate what already needs to be provided for planning purposes, for example?

There may be some overlap. Where that is the case, the Accelerator Project contact could supply the Hub with the relevant parts of the planning documents or project briefs.

The purpose is not to create extra work but for the Hub to help identify areas where work across projects can be joined up, problems addressed jointly, and common issues or successes shared with policy makers, for the benefit on the individual projects and the sector as a whole.

Q 1.16 How does the Accelerator proposal address barriers to zero carbon delivery?

Interestingly, the 2019 review “Better Homes, Better Wales, Better World – Decarbonising Existing Homes in Wales” by the Decarbonisation of Homes in Wales Advisory Group reached the view that “...decarbonising Welsh homes is not just, or even principally, a technical problem. It is about people and their homes. Decisions about home improvements emerge from the conditions of everyday domestic life.”

What is clear from our consultation is that there are barriers to zero carbon delivery at scale, ranging from motivational issues, to concerns about additional costs, to fears about choosing an appropriate design approach or installing the right kit, to how to help tenants and buyers understand how to use their low energy homes effectively.

These are not insurmountable problems, but they do require a better collective understanding of how to overcome them. The interviews revealed some interesting approaches to procurement and delivery being developed which should help to overcome some of the common barriers. The Hub would have an important role in updating the sector on such innovations as they arise.

The Council Housing Development Forum

Eleven councils have created a consortium to develop ideas first proposed in the Home-Grown Homes project. Their main activities include:

- Collaborating on the design of zero carbon timber frame homes
- Using a partnership approach to procurement
- Upskilling their teams and partnering with SMEs to build homes

To date the consortium has worked with a specialist architect to design a terrace of two-bed, four-person houses. They intend to achieve ultra-low carbon performance (including embodied carbon) with an offsetting approach to make these zero carbon.

The next phase of work will focus on designing additional property types, prototyping and testing the building system, securing warranties, completing whole life carbon modelling, and developing a manual for both manufacturing and assembly of the homes.

The project is seeking to fundamentally change how new social housing is delivered in Wales.

Q 1.17 What assurances are there that developers will take part in Accelerator Projects?

The point of setting up a Welsh Hub is to support Welsh developers, providing a central point of contact and services that they find useful and beneficial, allowing Wales to set its own zero carbon trajectory and find its own solutions.

We believe the combination of objectives set out above has the potential to see a very effective organisation created. The Accelerator Projects concept, with the associated tracking and reporting also ensures there is a practical, delivery-focused element to the Hub's remit – going beyond case studies and demonstrations to start to normalise zero carbon housing.

We estimate that developers would need to commit at most 3 to 4 days per year to gathering relevant information about their Accelerator Projects and taking part in Hub interviews and promotional activities. In return they would receive:

- A dedicated Accelerator Project officer at the Hub;
- An official avenue through the Hub for sharing their successes and raising specific issues and concerns with the Welsh Government;

- Access to the tailor-made forums for developers with similar delivery models/construction approaches to share learning and to benefit from collaboration;
- Relevant information signposted e.g. on possible funding sources or on technical areas such as life cycle analysis;
- Specific knowledge and information gaps identified e.g. training needs, informing future Hub workstreams and national policy;
- Case studies showcased across the Hub's network; and
- Potential for Accelerator Projects to be shared with funders, if requested.

We also believe it would be invaluable for the Hub to enter into discussions with the Welsh Government about what additional official recognition might be possible for Hub Accelerator projects. After all, these projects would essentially be “going early”, building to low energy and zero carbon standards voluntarily ahead of national regulations, with resulting benefits for Wales in terms of energy and carbon savings. This recognition should be something tangible, which sees a benefit being received, e.g. financial or tax incentives.

Another possibility for consideration is for future innovation funding programmes, to make it a condition of funding that the project also becomes a Hub Accelerator Project, taking some of the pressure off the government to track their progress.

Lastly, once key stakeholders have had a chance to comment on this scoping report, and assuming the recommendations are accepted, we propose to approach a number of developers to test the ideas, and particularly the pledge process. We would hope to gain a commitment in principle to participate from a couple of developers prior to the launch event.

Q 1.18 Do pledges and commitments work in practice?

Pledges work, of course, on a voluntary basis and the success or otherwise depends on how proactive and well-resourced the organisation running the initiative is.

There are plenty of examples of pledges being used to publicly state an organisation's intentions, and one such example is the new “Pledge to Net Zero” site which has “been established to commit organisations from the environmental sector to take a leadership role in the transition to a Net Zero carbon economy.” There are 79 signatories at the time of writing, with a deadline for participation in April 2021.¹⁰

¹⁰ See [Home | Pledge to Net Zero](#)

Constructing Excellence in Wales “Exemplar Projects” programme

Designed to combine the principles of both ‘Rethinking Construction’ and the Welsh “Well-being and Future Generations Act” the programme seeks to increase awareness of good practical examples of delivering “Best Value Sustainable Performance”. Project teams are encouraged to take part by committing to a combination of clearly defined KPIs and meeting requirements to share learning experiences.

The emphasis from 2020 onwards is more at a programme level, so whilst individual projects are still welcome the hope is to work with major clients having a significant pipeline of future projects to provide data more linked to Constructing Excellence in Wales’ preferred new programme approach to exemplar projects.

The Hub’s Accelerator Projects would be complementary, focused on detailed technical and practical aspects of zero carbon delivery and performance monitoring.

In the case of the Welsh Hub, the aim of the pledge would be very specific: to invite all developers (in a phased way) operating in Wales to commit to delivering a certain number of zero carbon homes, and ideally a number substantially higher than previous years. This would help to normalise delivery of zero carbon homes – eventually moving beyond these types of homes being seen as exceptions.

We believe it is a simple and direct way of driving action. And the tracking process and one-to-one interviews envisaged should also provide greater overall value for the housing sector. It would be a concrete initiative to point to in advance of COP 26, and also fits well with the “Race to Zero” campaign.¹¹

As stated, in order to give a concrete answer to this question, appetite for this approach would need to be tested with developers before the Hub is launched, and the details of the processes developed after consultation.

Q 1.19 Would the zero carbon homes built under the pledges have been built anyway?

Possibly, but as stated, the pledge process would invite all developers operating in Wales to commit to delivering a number of zero carbon homes which is substantially higher than previous years. It would create a “push” or added motivation for developers to think about what is possible, especially through partnership working, collaboration, interest from funders in Accelerator Projects, and from actively seeking out the lessons learnt from earlier zero carbon projects. It is also highly likely that a number of complimentary spin-off projects would be created e.g. a zero carbon homes procurement framework.

Even for zero carbon housing projects already planned or built, the Hub would seek to share the lessons learned.

¹¹ See [Race to Zero: COP26 campaign launched to push nations towards net-zero targets \(edie.net\)](https://www.edie.net/news/race-to-zero-cop26-campaign-launched-to-push-nations-towards-net-zero-targets)

Q 1.20 Would the Hub have capacity to track individual projects?

Yes, but we recommend that housing providers are approached for pledges in stages:

- Stage 1 – Affordable/social housing providers – Autumn 2021;
- Stage 2 – Private developers – Autumn 2022; and
- Stage 3 – Potentially extend the model to existing social housing - Autumn 2023.

There are a maximum of around 35 Registered Social Landlords (RSLs) in Wales,¹² and we believe 11 local authorities who are developers. Therefore, this suggests an upper limit of 45 developers working with the Hub at any one time in 2021/22. However, some of these may not be operational, or may not have their own building programme that year, so the real number is likely to be lower.

For this model to work effectively the Hub would need to be properly resourced so there are a sufficient number of Project Officers collecting information about Accelerator Projects, raising the profile of them and keeping them visible. See more on this theme in Section 3.

Q 1.21 Would the Accelerator Project tracking service be free?

Yes, for Accelerator Project participants. It would be a core activity of the Hub delivered through operational funding.

See also Section 3 on the proposed funding model and possible future revenue streams.

¹² See [Registered social landlords | GOV.WALES](https://gov.wales/registered-social-landlords)

Section 2 – The Business Case for a New Hub

Section 1 of this report summarises the overarching challenge that the Welsh housing sector is facing as a result of the Climate Emergency and the drive towards a net zero carbon economy, i.e. the need to substantially scale up the delivery of ultra-low energy and zero carbon homes. This period of change will require an unprecedented level of cultural change and rapid adoption of innovation, skills and knowledge across the sector.

This section does not seek to further explain the overarching policy drivers but focuses in on the feedback we have received during the consultation process and interviews. Based upon these findings we make proposals relevant to the Hub's work programme.

Q 2.1 What specific problems would the Hub need to solve?

There are a number of well-known core challenges which were echoed by interviewees, and which need to be solved to allow Wales to meet and prosper from the zero carbon transition. These include:

- A general concern that the level of technical and/or commercial understanding across the housebuilding supply chain is currently insufficient to deliver zero carbon homes at the scale Wales requires;
- Clients who are funding and purchasing zero carbon homes, in both the public and private sectors, are uncertain as to what “good” looks like and how best to procure it; and
- Feedback that building control, insurance and warranty providers do not currently have the technical knowledge to understand how best to assess the quality, and real-world energy performance of the types of homes which will need to be built in future. These will need to meet more stringent standards, which are also likely to be broader in scope (such as covering unregulated energy), resulting in the adoption of new design strategies and forms of construction systems, and the installation of new technologies.

By combining the findings of the online survey and the deeper interviews with individuals it is possible to see why the concept of a new ‘Hub’ has so far received a widely positive response.

Issues raised by consultees include:

Perceptions of the Welsh Government's Innovative Housing Programme

- There was frequent comment that whilst the funding for low carbon housing projects is welcome, more detailed and regular feedback on the outcomes of projects and emerging best practice is needed from IHP projects in Years 1,2 and 3. This is something the Hub could assist with;

- Participants also fed back that first phase projects lacked clear guidance on what was to be monitored during the BPE stage, leading some to see this as a missed opportunity to capture vitally important data;
- The more recently launched ORP appears to have learned from some of these lessons, but several people expressed a similar concern that dissemination of the lessons being learned may not be as co-ordinated and accessible as they might hope; and
- It was also interesting to learn that awareness of plans for partnership working to procure and deliver Net Zero Timber Frame solutions, led by eleven councils forming the Council Housing Development Forum, was comparatively low even in the social housing sector, and in spite of a number of recent presentations about the work. Once understood, the project's approach and aims appear to be widely supported, but the lack of awareness and understanding of how to engage with the project echoed wider feedback and concerns about the need for more regular and detailed communication on major, relevant projects and initiatives.

Research to Identify Early Lessons Emerging from the Innovative Housing Programme, September 2020, Centre for Regional Economic and Social Research and the Welsh Government

Research was undertaken to “understand the early construction messages emerging from the IHP, including those relating to the planning process, construction challenges and benefits, costs, materials and timescales. The research involved qualitative interviews with housing developers (mostly Registered Social Landlords) leading the 18 schemes funded during year one of the IHP and, where possible, their construction partners.”

See [Research to identify early lessons emerging from the Innovative Housing Programme: Summary \(gov.wales\)](#)

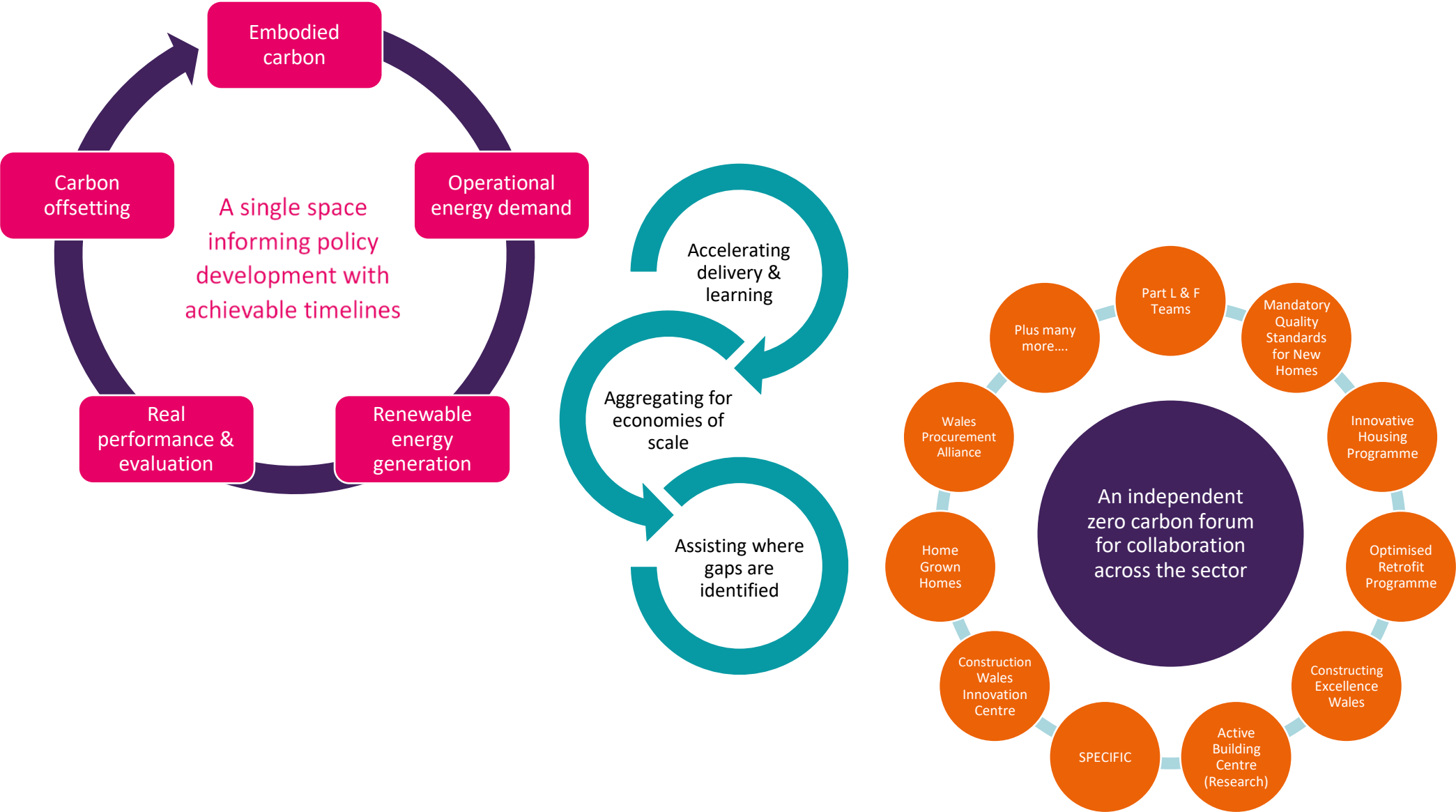
Perceptions of how rapid policy change and innovation risk can be effectively managed

- Both housing providers and the finance industry expressed real concern about how the risks inherent during such a period of rapid innovation are being monitored and managed. This is not a sign of wanting to resist such change, quite the opposite, we found several organisations wanting to actively solve the issue, but all felt they did not know where or who to engage with to do this in a coordinated manner; and
- Of particular interest was the message from a significant number of social housing providers and some of the larger UK national developers, that they did not feel there was currently an active communication path to the Welsh Government itself. It does appear that whilst some of the better resourced and connected organisations are able to engage with policy teams, a significant proportion still feel disconnected from the process.

On balance these findings suggest that communication, be that between policymakers, innovation funders, academic researchers or the mainstream housing supply chain, represents one of the biggest challenges to the mainstream adoption of zero carbon homes.

It is therefore this role of providing a strategically coordinated central meeting and service point for all concerned that a new Hub needs to deliver in order to be successful.

Strategic meeting of Welsh government & the zero carbon housing industry



Q 2.2 Why is it so important that Wales works to scale up its delivery of ultra-low energy and zero carbon homes?

All innovations tend to start within a niche sector of the market, typically the higher value offerings, in order to support the additional cost of R&D investment. The complex nature of housing supply means that this process, is to some degree, even more pronounced. To be successful in delivering zero carbon homes as a mainstream offering Wales needs to not only increase its product and system capabilities, but also its skills and knowledge capacity.

Despite support being provided by the Welsh Government-led IHP, for instance, the proportion of low energy and zero carbon homes being built in Wales remains too low. The level of the scale-up challenge becomes even more apparent when noting that of the cutting-edge homes built already, very few, address all five of the elements of UKGBC, LETI, Woodknowledge Wales holistic definition of zero carbon, for example. See Question 1.8 for more details on the definitions.

In addition, as a comparatively small part of the UK new build market there is a risk that larger developers, contractors and manufacturers focus on the English and even Scottish market demands first. The net result being that Wales is expected to accept products and solutions originally designed to meet the needs of different markets.

To reduce this risk, and also meet its ambitious climate change and energy-related ambitions, Wales will benefit from fostering its own environment to encourage innovation, practical trials and knowledge sharing. This will help to ensure that technically suitable and commercially viable solutions are developed with the Welsh market in mind, whilst also adhering to wider harmonised standards where relevant.

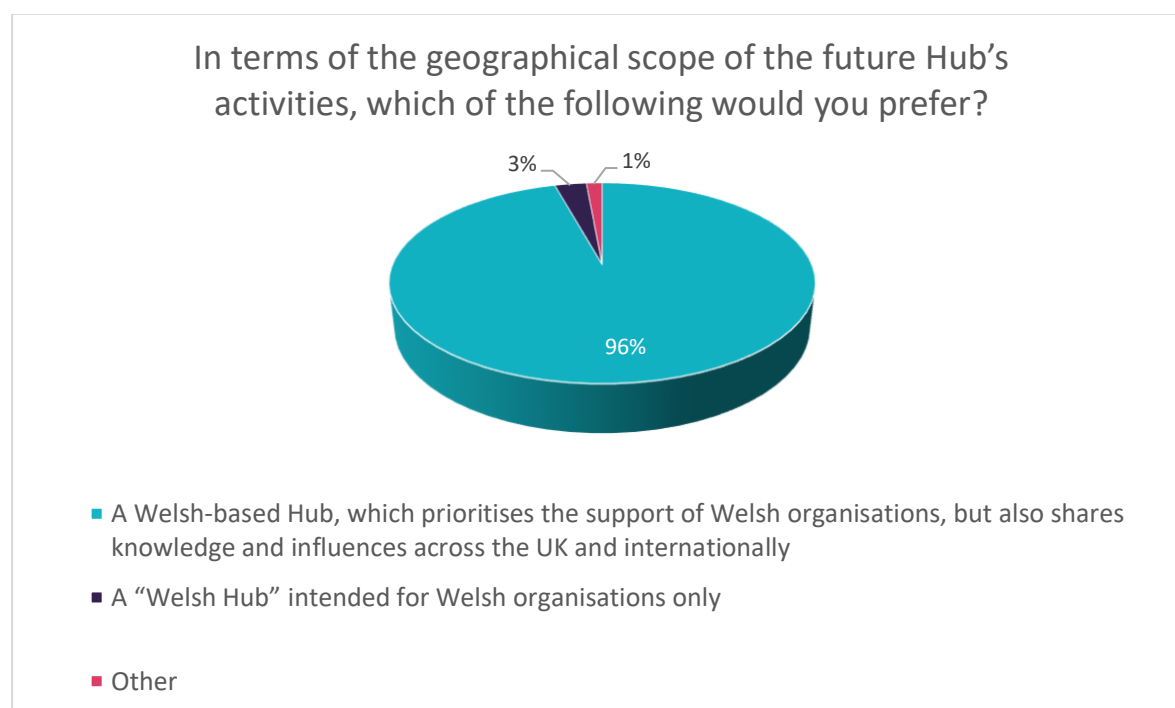
Q 2.3 Why a Wales-centric Hub?

Regarding the need for a supply chain scale up, there is an argument for Wales to take a proactive lead in encouraging organisations to develop technological and procedural solutions tailored to the nation's specific housing types and economy. However, this scoping exercise has also highlighted some of the wider potential benefits of meeting the zero carbon housing challenge:

- There is a clear desire, especially from some within the finance sector, to see this shift in how future homes are designed and constructed as a catalyst to increase the value of both Welsh products and the skills of people involved in their delivery; and
- The Welsh timber industry is well placed to benefit from an increase in zero carbon delivery for example, stemming from the growing demand for lower embodied carbon

construction and off-site manufacture. Indeed, the development of this market is something the Welsh Government is actively promoting in the social housing sector.¹³

We have therefore recommended a Wales-centric Hub, rather than one with a wider geographic remit which might struggle to focus its efforts on the spectrum of Welsh-specific objectives. It is important to note that the survey responses clearly indicated that whilst the Hub's delivery should be Wales focused it must draw inspiration and best practice from a broader UK and international perspective.



Q 2.4 Should the Hub be officially endorsed by the Welsh Government?

It is possible to envisage two distinct routes by which the Hub could be developed based upon the scoping study and formalised in an "Invitation to Tender":

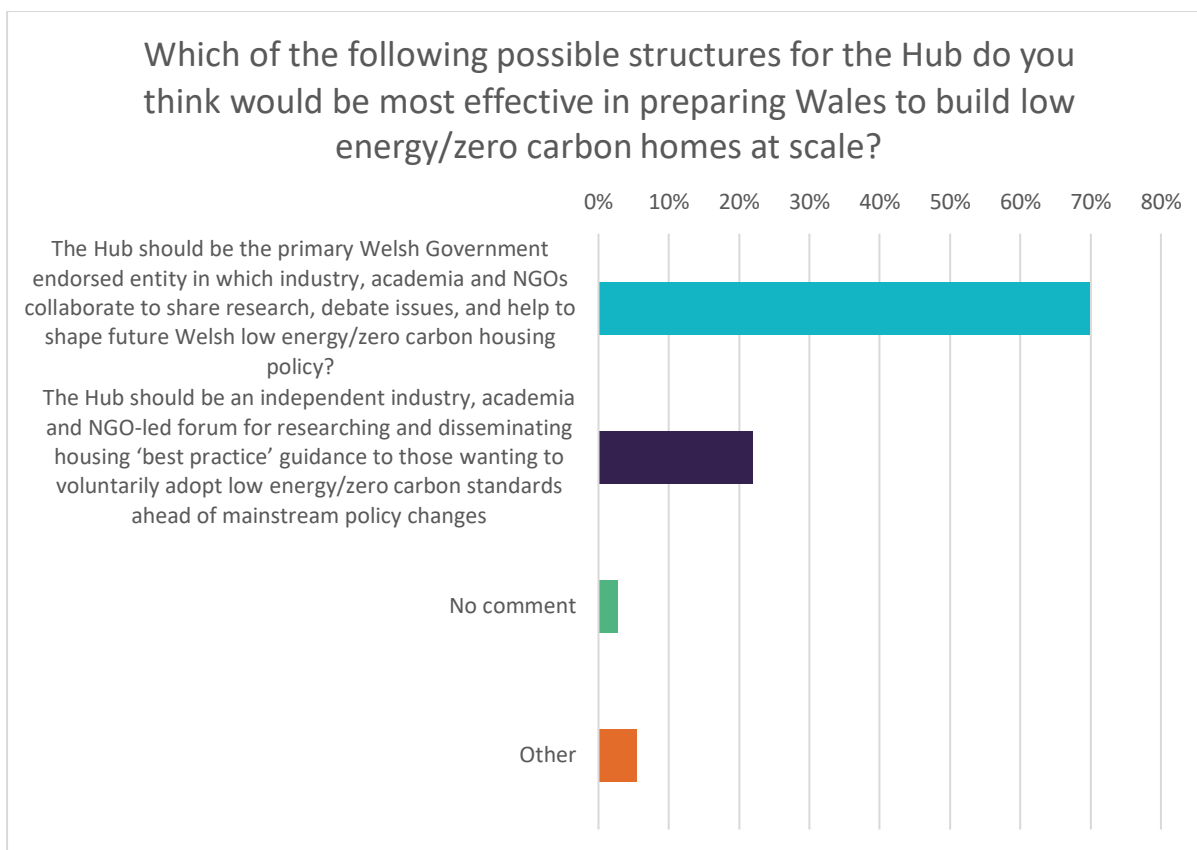
- An entity, actively feeding into policy; and
- An industry-led Hub which promotes best-practice and the voluntary adoption of zero carbon standards.

Whilst on the surface quite similar, the closeness or otherwise of the relationship with the Welsh Government would likely lead to very different levels of impact on the mainstream industry. These can be summarised in the following manner:

¹³ See [Social house building strategy \(gov.wales\)](https://gov.wales/social-house-building-strategy)

Government-endorsed entity actively feeding into policy	Industry-led, voluntary best-practice hub
Pros	
A direct communication channel to policy makers	Leading by example to prove technical and commercial viabilities
Research will be submitted at key policy decision gateways	Ability to show where existing policy plans are not ambitious enough
Ability to influence Government funded R&D investment and pilots	
Cons	
Perceived as reducing ambition in order to find consensus	Limited commercial value as no special route to policymakers
Perceived as prolonging consultation on already pre-decided future standards	Low risk of letting “others” lead as no policy gateways to influence
	Perceived as an idealistic lobbying group
Higher level of mainstream engagement	Lower level of mainstream engagement

Responses from the survey gave a clear message, as did the interview process, that any new Hub would need to be established as the “...the primary Welsh Government endorsed entity in which industry, academia and NGOs collaborate to share research, debate issues, and help to shape future Welsh low energy/zero carbon housing policy?”, with around 70% of respondents preferring that option.



Survey comment: “Either type of Hub is possible, but Welsh Government backing is important in terms of how legislation is formulated and influenced.”

This answer begins to suggest what the Welsh Government and Hub management could set as Terms of Reference.

The exact Terms of Reference developed for the new Hub would need to be finalised during the initial set-up phase, informed by this scoping report, and through collaboration between an interim Hub’s Board of Directors and the government department providing any funding.

By way of example, including text about clear and regular lines of direct communication between the Hub and Welsh Government in the core Terms of Reference would help to signal one of the key benefits of being the primary government endorsed body. The following illustrates the concept:

‘The Hub must report its initial findings and three-year workplan, within [three] months of the launch, to the [Minister for Housing and Local Government]. It must then report on a [quarterly] basis on national progress in scaling up mainstream zero carbon housing delivery, plus produce an annual report which highlights areas where further government support is required to accelerate progress and increase capability.’

We believe that government endorsement of the Hub would increase industry engagement with it, as it did with the former Zero Carbon Hub. However, it will ultimately be for industry to decide how much of an opportunity (or risk) any new Hub poses based not only on the

scope of its activity, but also the likely level of impact the work will have on their future commercial environment. This may seem like a naively obvious statement, but it is all too easily forgotten when surrounded by enthusiastic and well-intentioned early adopters who are typically very willing to engage during the early stages of new policy initiatives.

Q 2.5 How would The Hub support the development and use of Welsh supply chains?

It is clear from the interviews and literature review that supporting the growth of a Welsh-based supply chain is of significant importance to the Welsh Government, to many social housing providers, Wales-based procurement initiatives and certain financial institutions. When this is added to the clear desire from the current IHP funding round (2020/21) to support MMC and Welsh timber frame manufacturers, it is logical to envisage the Hub actively seeking to include a local supply chain element to all its activities to maximise social value and community benefits.

The most high-profile expression of this would likely be within the Accelerator Projects themselves – for example, by asking developers questions about their intended supply chains strategies.

Survey comment: “The Hub should support Welsh industry, employ local people, with benefits going back into the Welsh economy.”

Discussions with groups such as Cartrefi Conwy – Creating Enterprise project, the Welsh Procurement Alliance and Constructing Excellence in Wales also indicate there is considerable interest in creating collaborative procurement projects. For example, sharing how best practice techniques such as Dynamic Purchasing Systems and aligning elements of multiple smaller new build programmes into one larger more attractive opportunity can encourage wider supplier engagement whilst simultaneously creating a culture of innovation and continual improvement. The Hub would also need to engage with the Welsh Government Commercial and Procurement Directorate, Community Housing Cymru and Welsh Local Government Association to maximise impact around local supply chains.

Supply chain development is often mistaken to mean only the products and systems required to build a home. But it is important to acknowledge that without a parallel increase in skills and knowledge across the entire supply chain Wales will not be able to deliver at the scale required.

The Hub will therefore need to work very closely with organisations like the Construction Innovation Centre Wales and CITB to ensure the lessons learned from the Accelerator Projects are shared with education and CPD providers on an on-going basis.

Q 2.6 How would the Hub's activities interact with key relevant Government departments and associated policy initiatives?

As noted, one of the most important findings of this scoping study is that there is widespread support across the Welsh new build housing supply chain for any new Hub to be: '...the primary Welsh Government endorsed entity in which industry, academia and NGOs collaborate to share research, debate issues, and help to shape future Welsh low energy/zero carbon housing policy'.

It is therefore critical that the Hub delivery team interacts on a regular basis with all Welsh Government departments responsible for decisions related to zero carbon housing policy, and that clear Terms of Reference are set, as highlighted in Question 2.5, to ensure this happens.

At a more operational level we propose that representatives of the Hub should engage with multiple levels of the Welsh Government and government-led entities including:

- **The Wales Construction Forum** – Presenting at the monthly housing focused briefings chaired by Deputy Minister for Economy and Transport and attended by the Minister for Housing and Local Government;
- **The Ministry for Housing and Local Government** – Working to support the research needs of the Part L and Part F technical teams in preparation for future consultations on regulations and zero carbon definitions;
- **The Ministry for Environment, Energy and Rural Affairs** - Working to support the research needs of the energy policy technical teams to help highlight supply side challenges being identified from the Accelerator Projects. For example, increased demands place on existing local electrical distribution networks due to heat pumps, local LZC generation and domestic EV charging stations;
- **The Innovative Housing Programme (or its successor)** – Helping to inform the focus of future annual funding competitions and potentially helping to select the successful new build projects; and
- **The Optimised Retrofit Programme** – Working collaboratively to identify areas of mutually beneficial technical research and best practice. For example, quality control systems and building performance evaluation.

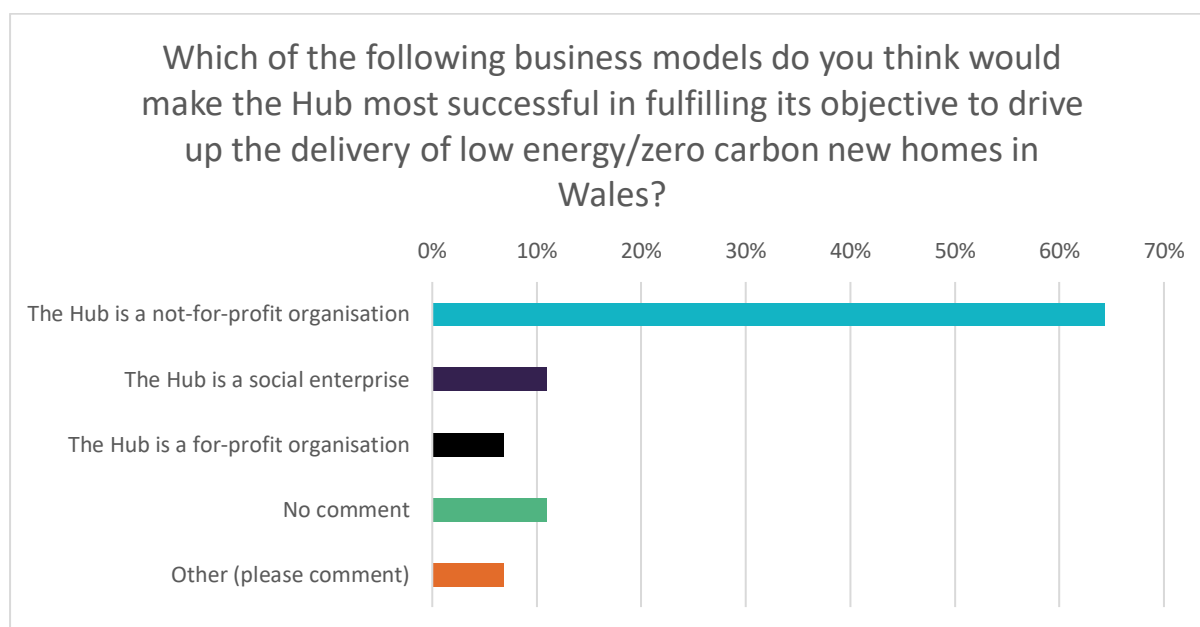
Section 3 – Delivery and Governance

Q 3.1 What should the Hub's business model be?

The new Hub being proposed would have a uniquely influential position within the Welsh housing sector. As stated, feedback from both the survey and industry interviews clearly indicated that two key features are important:

- It should be the primary Welsh Government-endorsed entity helping to shape future Welsh zero carbon housing policy; and
- It must be, and be seen as, an independent, construction approach-agnostic, organisation.

The requirements for independence, transparency and a mandate to drive action across the entire industry suggest that a “not-for-profit” model, in the form of a private company limited by guarantee without share capital, would be more suitable than a ‘for-profit’ model, or traditional trade association membership approach. This form of set-up was also preferred by the majority of survey respondents.



The above approach would follow the same principal as the former UK Zero Carbon Hub. Of interest here is that this meant the former Hub could appoint the then Department of Communities and Local Government (DCLG) lead civil servant for Building Regulations as a Board Director.

The proposed funding model for the Welsh Hub is discussed in more detail in Question 3.10, however, discussions with potential supporters and collaborators have shown that “in-kind” support, and reduced technical consultancy day rates are a possibility, whilst actual capital funding for core activities (e.g. team salaries and website creation etc.) from industry during the Hub’s early years is unlikely. Sponsorship for individual events and research, for example, is also very likely to be achievable. Interestingly, some organisations consulted expressed concerns that another “membership” style organisation in this area could have unintended negative consequences for others.

Survey comment: “Administering subscriptions would be more challenging and time consuming and therefore a distraction from core delivery.”

In the longer term the Hub team could also consider offering “paid for services”, as discussed in Question 3.12. However, if at a future date it does, it may be beneficial from a reputational perspective to consider becoming a Community Interest Company (CIC). This would follow the example of similar organisations such as the GHA, Retrofit Academy and Creating Enterprise (Conwy).

Q 3.2 How could the Welsh Hub interact with the Home Builders Federation (HBF) Future Homes Task Force and other organisations doing similar work?

The recent England-focused consultation by MHCLG on plans for the Future Homes Standard from 2025 has understandably triggered much interest from the house building industry. The Home Builders Federation (HBF)-led “Future Homes Taskforce” is probably the most high profile. A core team, which contains several of the original Zero Carbon Hub leadership is in discussions with the UK Government about potentially launching a new “delivery hub” during 2021.

Our scoping work and proposed set-up for the Welsh Hub should mean that the HBF Task Force does not pose a threat to the concept of creating a Wales-centric Hub due to the logic presented in earlier sections. For example:

- Welsh technical standards and policy timelines are likely to be, and are already, different to England;
- There are different social and economic opportunities to consider in the Welsh context; and
- Comparatively few of the English-based major housing developers operate within Wales.

Preliminary discussions with some of the major house builders and the HBF team suggests that communication between the two Hubs would be strongly welcomed. Especially as some feel they currently struggle to reach the key Welsh policymakers via existing organisations.

Therefore, in a similar manner to the way the former Zero Carbon Hub operated in Wales, we envisage very close links with the HBF Future Homes Task Force to share best practice and co-ordinate dissemination events. It should also be noted that members of the Welsh Government Part L team were actively involved in some of the Zero Carbon Hub research projects.

Q 3.3 Which Wales-specific initiatives will the Hub need to interact with and how?

As explained in Question 1.3 one of the core principals of the Welsh Hub concept being proposed is that it should Accelerate, Aggregate and Assist organisations and companies already active in the zero carbon homes sector. The following diagram shows examples of Government and industry-led initiatives that would be a priority for early engagement:



Close collaboration with these groups, plus other public and private sector organisations such as Local Partnerships, the Decarbonisation of Homes in Wales Advisory Group, the Design Commission for Wales, Woodknowledge Wales, BRE Wales, Arup (Cardiff), the Welsh School of Architecture at Cardiff University, and Swansea University during the first six months of the Hub's existence is critical. This will ensure that the work programme for first three years covers the most important issues and prioritises them appropriately.

Q 3.4 How would the Hub address the risk of energy standards diverging across the UK?

Welsh new build energy and carbon standards are already different to those in England, for example, its fabric standards. Wales has been clear about its overall intention to be a leader on this policy area.

Our research did identify some concern, mainly from the larger national developers and financial institutions, about the impact of diverging standards. However there does seem to be an acceptance of this and a desire to work with any groups helping to clarify what these differences might be and how they can be managed within supply chains and technical departments.

It can also be inferred that as the survey responses strongly support the concept of a Welsh-centric Hub, there is recognition that Wales is likely to continue to set its own standards and develop its own solutions.

We propose that the Hub would follow a similar approach to the former Zero Carbon Hub in managing differences in standards across countries. By proactively including members of building regulation teams from each country at research and dissemination events, and carrying out comparison work if needed, the Hub would help the supply chain understand and differences in approaches and standards, and similarities, well in advance of implementation.

Q 3.5 What stakeholder engagement work would be required in the first year?

As highlighted above, it is important that the Hub is seen as a welcome addition to the Welsh zero carbon homes community, and not just another organisation trying to stake a claim to this sector of the industry. Therefore, early engagement across the housing sector is key to creating the desired atmosphere as activities commence.

Confidential discussions should be held with leading members of the most influential organisations as soon as a decision is made within the Welsh Government to endorse and launch the Hub.

As detailed further in Question 3.8, we recommend that the Hub's Board of Directors has a suitable mixture of representatives from other organisations. In addition, alliances should be forged across the wider industry by recruiting people to lead the Hub's new Thematic Industry Forums (see Section 4 for details of the forums). Example forum leadership collaborations could include:

- Established lenders and funders;
- Leading warranty providers;

- Representatives from the Home-Grown Homes programme;
- Representatives from the social housing sector, wider housebuilding community and their supply chains; and
- Representatives from the IHP (or its successor) and Council Housing Development Forum

To increase the positive impact at the Hub's launch, as stated, it will also be important to invite a number of housing associations and councils to commit to undertaking Accelerator Projects before-hand. We propose that all councils and housing associations who have received funding via the IHP (or similar social housing funding programmes) are approached prior to the Hub's launch.

Workshops should be held to explain the 'Accelerator Project' concept and proposed scope of Hub involvement in their developments. Following refinement of the concept after this feedback we could then seek to have an initial group of developers agree to a "Pledge" before the launch, officially signing at the Hub's media launch event.

Q 3.6 What should the Hub's communications approach be?

At the core of the proposed new Hub's remit is a significant acceleration and expansion of collaborative innovation and supply chain scale-up across Wales. Feedback from the interviews has highlighted frustration that several innovative programmes and initiatives are being carried out, but dissemination of their lessons and resulting best practice guidance is too slow and, in some cases, has not been provided.

The Hub would seek to improve this situation by strategically coordinating an information campaign using multiple channels. This would include a combination of:

- New website with an easily navigable resource library;
- Creation of Thematic Industry Forums (physical and virtual) meeting regularly;
- Regional 'Accelerator Project Best Practice' workshops for Pledge signature developers
- Each Accelerator Project to have its own blog section on the website (with permission) potentially providing:
 - Regular progress updates (to share lessons across all delivery stages)
 - Time-lapse site webcams during the construction phase
 - Virtual "boot camp" events based around key construction stages with supporting best practice presentations from supply chain partners; and

- Events to disseminate Accelerator Project activities, promote future Government funding programmes and gather feedback relevant to Government policy and research. Events could alternate between locations in North and South Wales with a parallel live virtual attendee option.

Q 3.7 What Governance structures should the Hub have?

The importance of an independent, science-based, construction approach-agnostic ethos for the new Hub has been made very clear by all parties during the scoping study. In keeping with this is the creation of a transparent governance structure held accountable by an appropriately balanced team of respected industry figures.

A well proven and efficient model to achieve this is the combination of a Board of Directors (voluntary) supported by an Industry Steering Group. As detailed further in Question 4.4, recruitment of the Board would be a priority during the initial Hub set-up period. Once created the Board should be tasked with recruiting and establishing the Industry Steering Group.¹⁴ Whilst they would of course have the final decision, the following table gives an indication of the mix envisaged:

Industry Steering Group – Perspectives required to function well			
Planning Authorities	Design and Architecture	Energy Infrastructure Providers	Fabric First Strategy Proponents and Supply Chain
Active Building Strategy Proponents and Supply Chain	Academia and Building Performance Evaluation Representatives	Council Housing Development Forum Wales	Financial, Valuation, Warranty & Insurance Representatives
Skills & Training Providers	Community Housing Cymru	Private Developers	SME Contractors

Q 3.8. Which types of organisations should be on the Board?

A transparent and balanced Board make-up is critical to reinforce the overall ethos of the new Hub. As discussed in Question 3.11, it is envisaged that the Welsh Government would be the major funder for the Hub for the initial years and would therefore have the ultimate decision

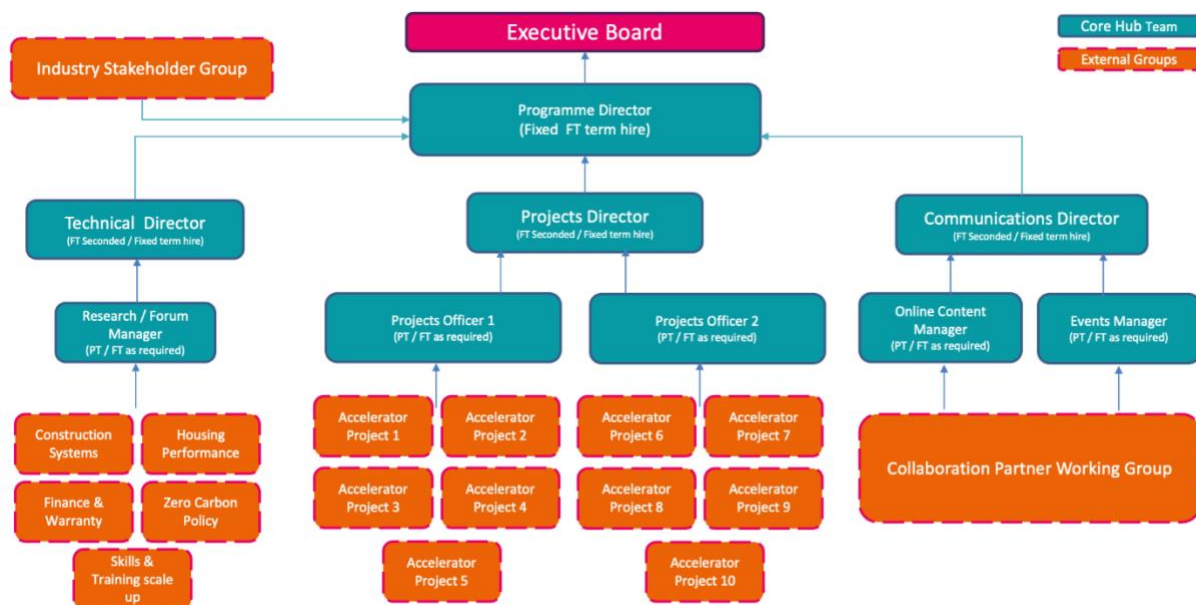
¹⁴ The Interim Hub team would begin this process.

on the Board’s membership. However, we would recommend the following as a starting point for consideration:

- Welsh Government – Deputy Director for Homes and Places;
- Decarbonisation of Homes in Wales Advisory Group – Chairperson;
- Community Housing Cymru (CHC) – CEO;
- ClwydAlyn – CEO;
- GHA (or similar) – Chair;
- Local Authority Building Control (LABC) – Board member for Wales;
- Financial Institution – Board member (ideally Wales-based building society); and
- Constructing Excellence in Wales – Chief Executive.

Please note, we have not to date directly proposed potential Board membership with any of these organisations.

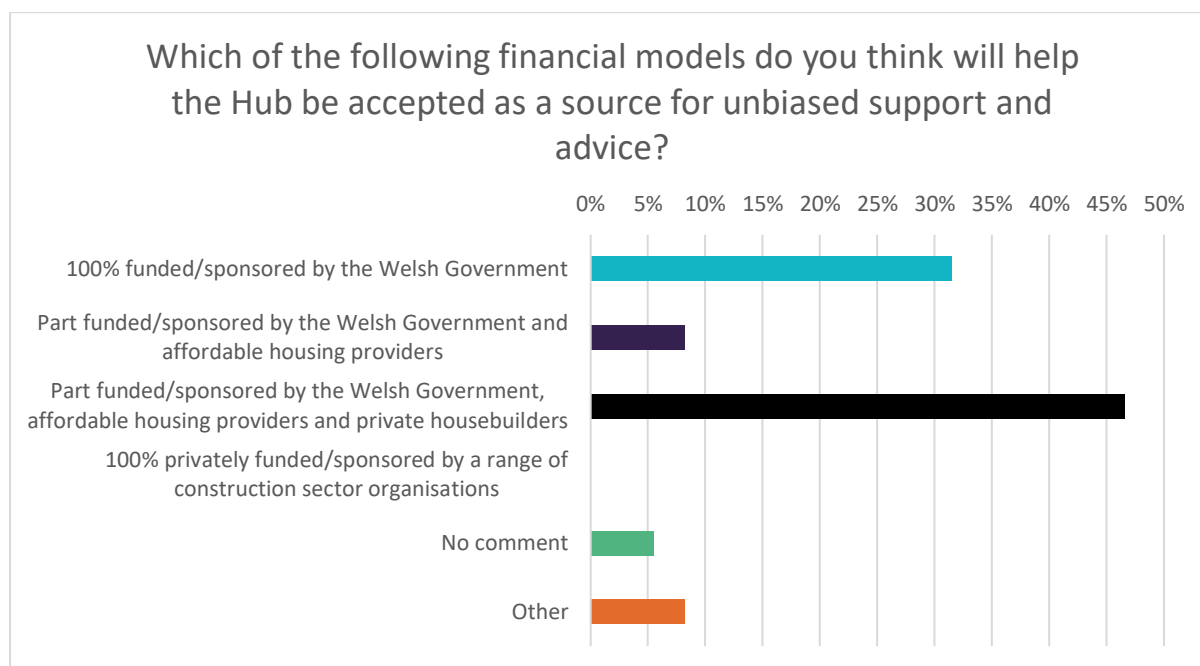
Q 3.9 What could the Hub’s delivery team look like??



As in Section 1, we have assumed there are a maximum of 35 RSLs operating in Wales and 11 developer local authorities. If 10% were inactive in 2021/22 this equates to around 40 organisations. If circa 50% of these signs a Pledge, there should not be more than about 20 working with the Hub at any one time. Of these we estimate that maybe 10 to 15 would have new build projects at a stage in terms of planning and design etc. that means significant interaction with the Hub Project Officers would be warranted.

Q 3.10 What funding model is recommended?

During the interviews and survey we asked for opinions on how the Hub should be funded and if it should consider charging a fee for its services. The responses presented below show there was a clear consensus that stakeholders expect the Welsh Government to be a major funder of such an organisation. 32% wanted to see 100% Government funding, and 47% preferring a mixture of Welsh Government, affordable housing provider and private housebuilder funding.



As mentioned, some organisations expressed concerns that another “membership” style organisation in this area could have unintentional negative consequences for others.

We therefore recommend that the Welsh Government should consider providing at least 90% funding for the core Hub team, engagement and dissemination activities and operational overheads during the first year of activity. Further discussion of what future income streams may be possible to gradually reduce this proportion of Government funding can be found in Question 3.12.

Q 3.11 What is the estimated budget required for the Hub's activities?

The following table provides an overview of the estimated Year 1 to 3 budgets required to deliver the scale of activity proposed in this scoping study. An A3 version is also available in Annex D.

Year 1-3 Budget (estimation of activity based on scoping study report)

Work Packages	Year 1	Year 2	Year 3	Headline activities & outputs
Work Package 1- Accelerator Projects	£ 30,000.00	£ 63,000.00	£ 99,225.00	Close co-ordination of data gathering and analysis for up to 30 live Accelerator projects per annum by Year 3
Work Packages 2 to 6 - Industry Forums)	£ 30,000.00	£ 31,500.00	£ 33,075.00	Organisation and communication between all forums = Construction Systems, Housing Performance, Funding & Warranty, Zero Carbon Policy, Skills & Training & Scale Up
Work Package 7 - Communications & Stakeholders	£ 77,000.00	£ 73,500.00	£ 82,250.00	Main website design, creation and management, Accelerator Pledge online tracker and construction site web cams, 2 x Collaborative Partner events p.a., 1 x physical annual conference, up to 2 technical research and / guidance reports p.a.
Core Hub Team	£ 112,500.00	£ 183,600.00	£ 249,480.00	Salaries for core team (Programme Director, Technical Director, Communications Director & Projects Director). Roles and PT/FT status ramping up over Years 1 - 3
Facilities & basic operational needs	£ 44,000.00	£ 46,200.00	£ 48,510.00	Office space in Swansea and North Wales, ad-hoc meeting space hire, core team T&S for comms and funding raising activities, payroll administration etc
Legal & insurance costs	£ 6,000.00	£ 6,000.00	£ 6,000.00	Organisational set-up and annual legal guidance, annual accounting support, professional insurances as required
	£ 299,500.00	£ 403,800.00	£ 518,540.00	
Estimated annual operating costs	£ 299,000.00	£403,000.00	£518,000.00	
Government funding request	£ 269,100.00	£ 342,550.00	£ 388,500.00	
Assumed percentage from government	90%	85%	75%	
SECURED - Industry in-kind support				
Office & Meeting spaces	£ 20,000.00	£ 10,000.00	£ 5,000.00	Assumes gradual move from 100% FOC to 50% and then 25% over 3 yrs
Expected - Industry in-kind support				
Original company set, accounts & legal support	£ 6,000.00	£ 6,000.00	£ 6,000.00	
Additional industry support to be found via event sponsorship and report branding	£ 3,900.00	£ 44,450.00	£ 118,500.00	

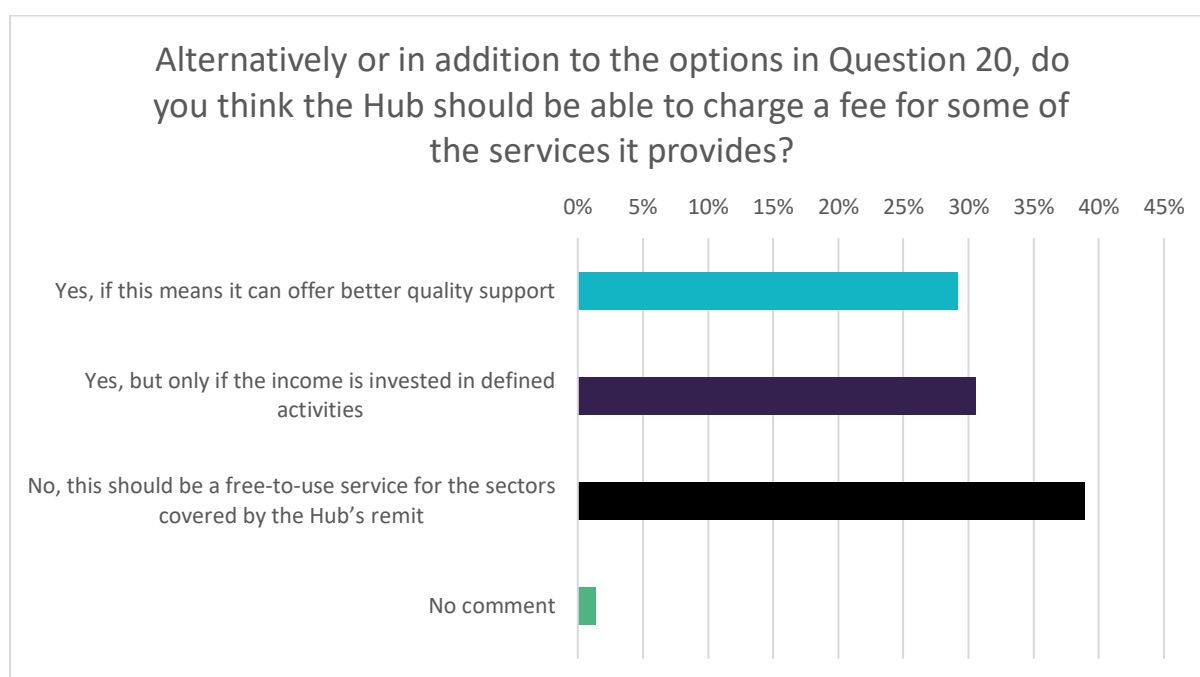
The interviews and survey indicated strong support for a Hub which is either funded by the Welsh Government entirely or funded by a mix of Government and developers. Government funding is considered especially important for demonstrating the official endorsement of the Hub. However, a key element of the proposed Hub's operating principal would be to leverage an increasing amount of industry in-kind support, and where possible direct financial support, each year. This is reflected in the proposed transition from an initial 90% government-funded Hub, reducing to 85% and then 75% over the first 3 years.

During the scoping study we have seen encouraging signs of industry willingness to provide in-kind support, subject to core Welsh Government funding being committed. An example being the offer of both a South and North Wales based office space, jointly estimated to be the equivalent of £15,000 to £20,000 support in Year 1. We are also confident that other core requirements, such as setting up the not-for-profit company and annual accounting systems, are likely to be offered by other industry organisations.

The feasibility of the Hub gradually securing between 10% to 25% industry funding is discussed further, based on the original UK Zero Carbon Hub experience, in Question 3.12.

Q 3.12 What are potential future revenue streams?

Unlike the consensus response seen relating to how the core Hub activities should be funded, in Question 3.10, the question of whether it should consider charging a fee for some services was more divisive.



Whilst around 60% of respondents seemed to appreciate that the Hub would need to seek some income beyond core government funding, there is a clear expectation for this to be for defined activities and to ensure a high quality of support to industry. It is important to note that nearly 40% of respondents wanted the Hub's services to be free to its target audience.

Therefore, on balance we recommend that during Year 1 of operation the Hub would have a greater positive reception from all stakeholders if it was "free-to-use". As mentioned, this does not preclude the Hub's leadership team seeking sponsorship from other sources for activities such as events, best practice webinars and research publications. But this should not be expected to provide any level of self-sustaining revenue stream during Years 1 to 3 of operation.

It is interesting to note that during some interviews people were supportive of the model being trialled by the Council Housing Development Forum Wales Timber Frame Procurement project. The concept of social housing developers using Innovation Funding to complete an R&D project, retaining the intellectual property and then using this as a potential future income stream was popular.

Also, it is understood that the 11 councils on this project are also providing some additional revenue support for the project (as a flat rate contribution). This type of willingness to invest

revenue in return for future innovation-related income should be investigated further by the Hub Board once established.

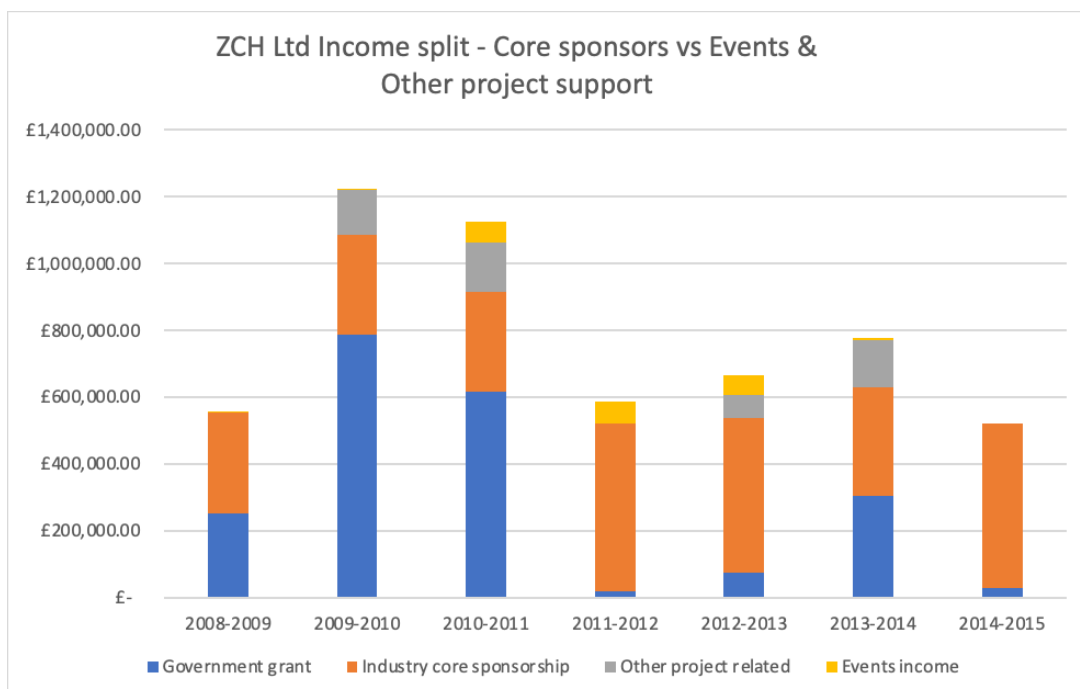
There is a strong prospect that the information management and collaborative working systems developed whilst supporting the Accelerator Projects could be packaged as a valuable service for other housing developers. Discussion should focus on the potential for creating a similar shared future IP model offer to the early adopters of the Pledge, in return for some form of additional capital contribution to the Hub during Years 2 and 3 onward.

If this service offering was to occur, the Hub would be wise to investigate the benefits of changing its business model to a CIC as discussed in Question 3.1.

A degree of caution is recommended to the eventual Board tasked with directing any such financial development. An initial review of the former UK Zero Carbon Hub's accounts between 2008 to 2015¹⁵ provides useful insight into how this balance of core funding from government can be used to secure industry support. As shown in the following charts there were periods of very significant "matched funding" to support core activities (staff, expenses, facilities) and also a more fluctuating amount of direct capital income from industry for activities such as events and sponsorship of individual reports or publications.

The most important learning to take from this information is that even during the Zero Carbon Hub's peak it was still heavily reliant on core industry sponsors (the National Home Builders Council (NHBC), Robust Details Ltd (RDL) and in later years the HBF and the Construction Products Association (CPA)).

¹⁵ Information has been drawn from Zero Carbon Hub Limited annual accounts available at Companies House – [LINK HERE](#)



The final interesting lesson from the Zero Carbon Hub experience is the level to which it managed to secure additional revenue streams from events and sponsorship of specific research projects or guidance publications. This can be seen in the highlighted cells of the following summary table.

	Year						
Funding streams	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015
DCLG Grant	£ 253,601.00	£ 786,742.00	£ 616,667.00	£ 20,000.00	£ 76,000.00	£304,000.00	£ 30,000.00
NHBC	£ 250,000.00	£ 250,000.00	£ 250,000.00	£450,000.00	£350,000.00	£250,000.00	£409,000.00
Robust Details	£ 50,000.00	£ 50,000.00	£ 50,000.00	£ 50,000.00	£ 50,000.00	£ 50,000.00	£ 50,000.00
HBF	£ -	£ -	£ -	£ -	£ 35,000.00	£ 25,000.00	£ 12,500.00
Working BC					£ 27,000.00		
CPA							£ 20,000.00
Funding streams	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015
Government grant	£ 253,601.00	£ 786,742.00	£ 616,667.00	£ 20,000.00	£ 76,000.00	£304,000.00	£ 30,000.00
Industry core sponsorship	£ 300,000.00	£ 300,000.00	£ 300,000.00	£500,000.00	£462,000.00	£325,000.00	£491,500.00
Other project related		£ 135,000.00	£ 147,000.00		£ 69,000.00	£143,000.00	
Events income	£ 3,674.00	£ 152.00	£ 61,580.00	£ 67,500.00	£ 58,500.00	£ 7,000.00	
Total income	£ 557,275.00	£ 1,221,894.00	£ 1,125,247.00	£587,500.00	£665,500.00	£779,000.00	£521,500.00

It appears that these additional revenue streams fluctuated between £70,000 and £208,000 over the 7 to 8 years of peak activity. This equates to a maximum of circa 10% to 20% of the total annual income streams. Which suggest that based on the working assumption detailed in Question 3.11 (Year 1 to 3 Budget), the eventual Board should gradually aim to secure 10% to 25% industry support annually, as this seems a suitably challenging yet achievable target for the core Hub team.

Q 3.13 How would the Hub's impact be measured?

The Hub's impact would be measured against the final KPIs developed, and preliminary suggestions given in Question 1.4. These include consideration of:

- The number of zero carbon homes built since the Hub's launch;
- The number of Accelerator Projects;
- Impact of aggregator projects on build costs;
- Impact of the Hub's activities on knowledge and skills;
- Impact of the Hub's activities on Welsh energy use and carbon emissions;
- Number of organisations on Hub's mailing list;
- Number of people engaging with digital content;
- Number of people attending virtual or physical events; and
- Number of people supporting the Industry forums.

Section 4 – Practicalities

Q 4.1 What should the Hub be called?

The holding name for the Hub has been the “Welsh Zero Carbon Housing Performance Hub”. This was intended to emphasise both the ultra low energy and zero carbon focus the Hub needs, plus the absolute importance of future homes performing as they are intended to.

We agree that each of these elements is important, and additionally, so is the “accelerator” concept set out in Section 1. Hence, we have considered four potential alternative, shorter names:

- The Welsh “Zero Carbon Homes Accelerator”;
- The Welsh “Housing Performance Hub”;
- The Welsh “Decarbonising Homes Hub”; and
- The “Welsh Homes Hub”.

We believe the first option best encapsulates what would be different about the Welsh Hub compared to other initiatives and networks such as the HBFs Future Homes Task Force and the BPN. Whilst the Hub would be focused on both on the delivery of ultra-low energy and zero carbon homes, as described in Section 1, it recognises that zero carbon is ultimately where the built environment will need to be.

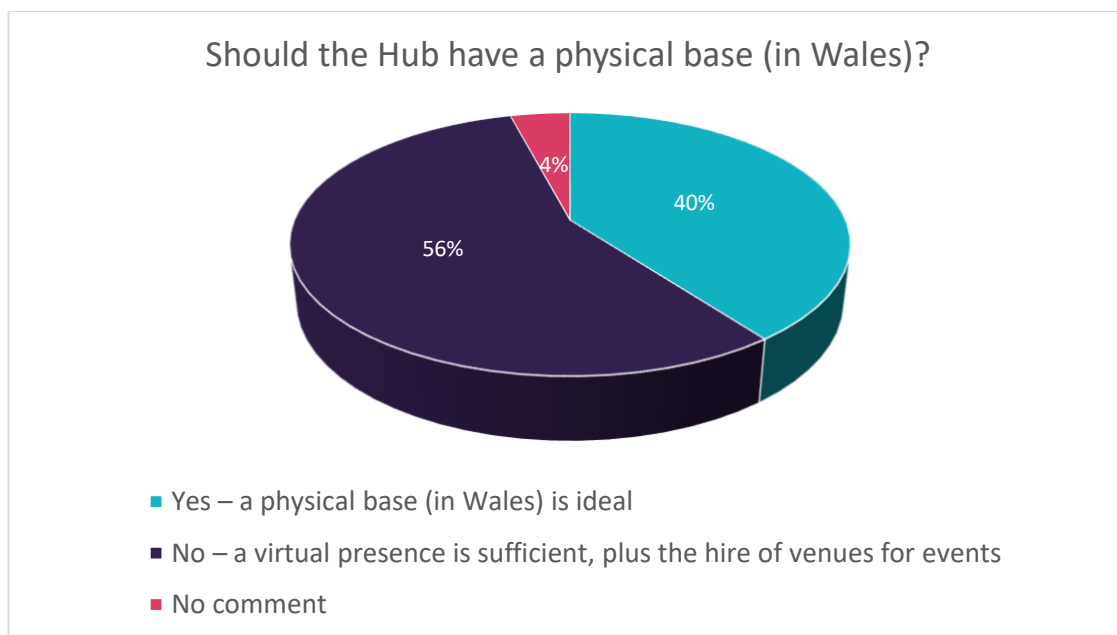
Q 4.2 Should the Hub have a physical location?

Just over 50% of the respondents to our survey felt that a “virtual hub” would be sufficient, coupled with venue hire for events. However, a significant proportion would prefer the Hub to have a physical base.

A virtual Hub would allow more of the budget to be spent on delivering objectives, rather than on leasing office space. It would also reduce the need for travel, plus the sector has proven during the Covid-19 pandemic that much of the work the Hub would do can be carried out very effectively online.

As noted in Section 3, the scoping team has already been offered free office space for use by the Hub for meetings etc. by the Active Building Centre in Swansea and ClywdAllyn in St Asaph, worth a significant amount, and which would warrant listing these organisations as official Hub sponsors.

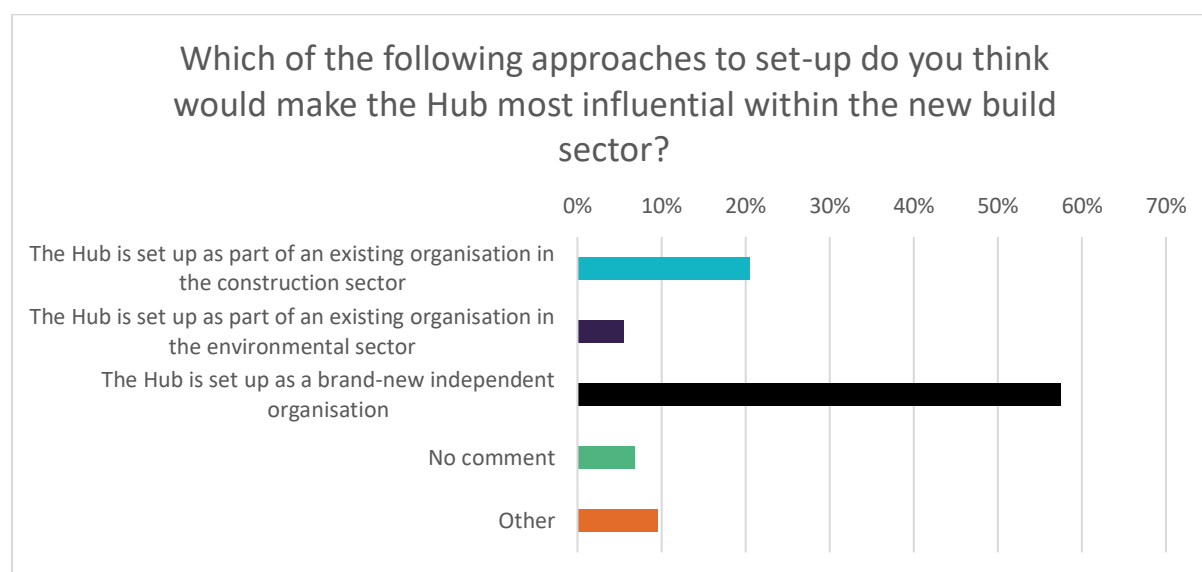
Therefore, we recommend that the Hub is set up as a virtual organisation, but with “hot desk” office space for team members and meeting spaces secured in two locations – North and South Wales – plus contracts made with a one or two venues, at reduced rates if possible, for larger events.



Q 4.3 Should the Hub be a new entity or sit within an existing organisation?

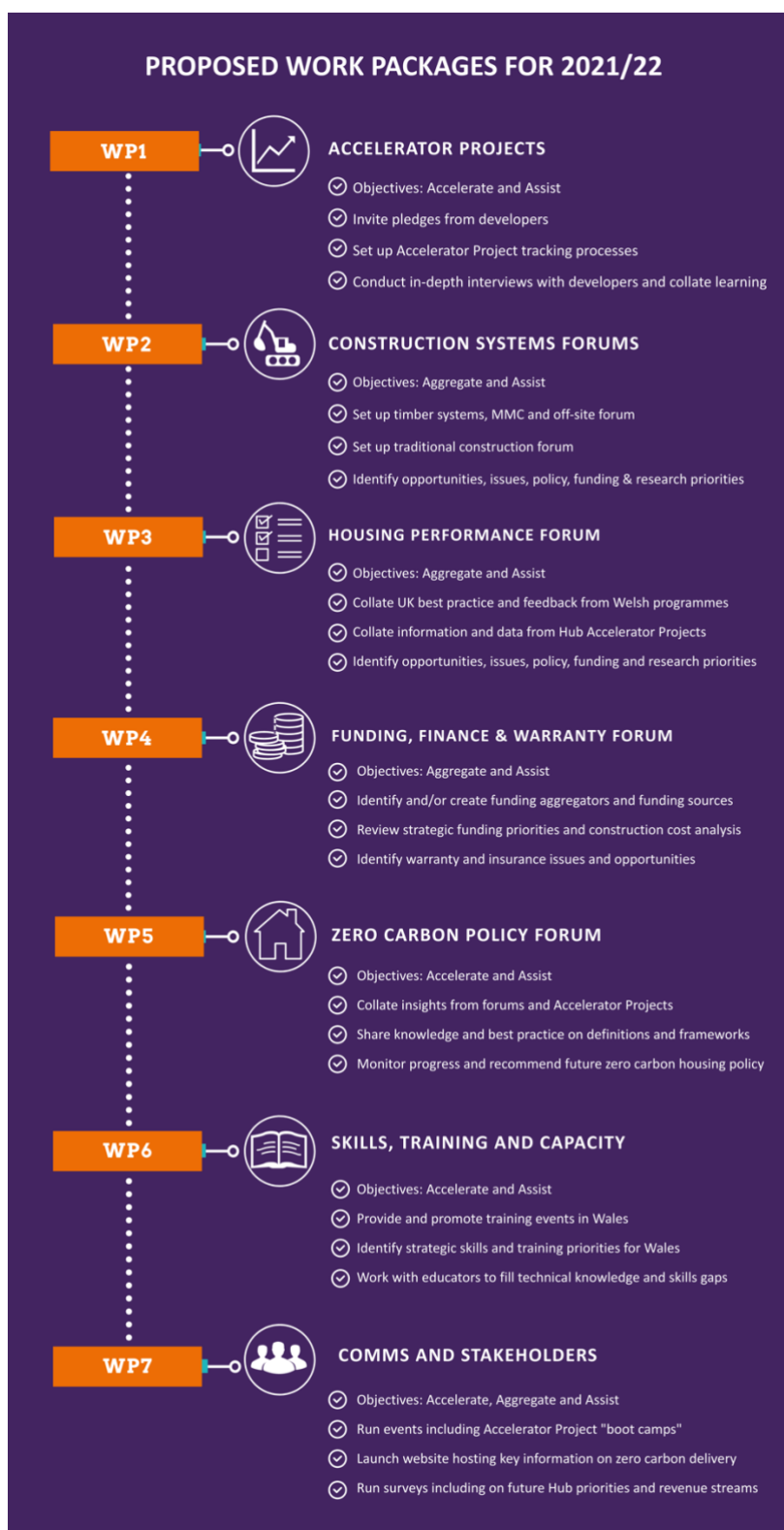
Around 57% of respondents would like the Hub to be a new, independent entity. The second most popular option – at 20% - is that the Hub sits within an existing organisation in the construction sector. As highlighted above, the independence of the Hub is crucially important.

Our recommendation is therefore that the Hub is set-up as a new entity with Terms of Reference setting out exactly how the Hub will interact with the Welsh Government and other influential bodies such as Constructing Excellence in Wales. In addition, we recommend that a Strategic Advisor such as the GHA, with their existing networks and experience in driving the zero carbon housing agenda, is appointed to the Hub. See more on this theme in Section 3.



Q 4.4 What would the Hub's key work packages be?

The following work packages are proposed (see the infographic). The communications work package would include activities to help educate and excite householders about zero carbon housing and help people better understand their new zero carbon homes.



Q 4.5 What website address should the Hub have?

If any of the names proposed in Question 4.1 are accepted, then the following domain names are currently available:

- “zerocarbonaccelerator.org” (or .com)
- “zerocarbonacceleratorwales.org” (or .com)
- “housingperformancehub.org” (or.com)
- “decarbonisinghomeshub.org” (or.com)
- “welshhomeshub.org” (or.com)

Shorter URLs are recommended.

Q 4.6 Who would host the website?

As the Hub would have a significant online presence, then it is important that the website looks good, functions well and is hosted on a reliable server.

Along with potentially providing an advisory role to the Hub, the GHA has the capacity to host the website and could potentially provide this service assuming the Hub’s budget covers hosting and maintenance fees. The website would then be developed with Welsh Hub branding.

We have estimated that a minimum of £15,000 would be required for brand design and website development.

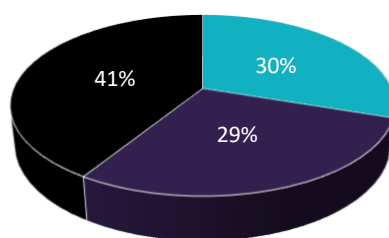
Q 4.7 What website content would be useful?

A full specification for the Hub’s website will need to be developed, and at least two to three months allowed for branding, web development and testing.

It is envisaged that the website will focus on signposting and communicating knowledge and information aimed at supporting Welsh developers and their supply chains, for example Welsh-specific zero carbon case studies and best practice guidance.

However, respondents to the survey indicated that they would also welcome content drawn from across the UK and Europe. This would include best practice guidance, case studies, policy and information about zero carbon standards and definitions.

In terms of information on the Hub's website which option would you prefer?



- The content primarily relates to Wales (i.e. Welsh-specific case studies, research projects, guidance etc.)
- The content is drawn from across the UK
- The content is drawn from across Europe

The website would include pages on:

- Accelerator Projects – High-level information about the Projects, blogs, data etc.;
- Welsh Initiatives and Programmes – Signposting information on funding programmes, research and demonstrators, and new initiatives;
- Best Practice Guidance, Standards and Reports – On the key elements on zero carbon frameworks, health and well-being, and industry energy and carbon standards;
- Welsh and UK Policy and Regulation – Energy and carbon standards for housing and zero carbon definitions;
- Thematic Industry Forums – A space to share learning, opportunities and issues between developers such as on funding, and between those with similar construction approaches; and
- Q&As – On technical and practical questions, developed by subject experts.

Q 4.8 What workstreams are recommended for the Hub's first year?

Following the launch, there would be a number of important preliminary tasks which could be carried out by an interim Hub team, made up of scoping team members and with the GHA initially providing secretariat and project management services. For example, securing a number of initial Accelerator Projects and setting up the Hub's governance structures. The Gantt chart below is a high-level, preliminary suggestion for key tasks.

Once the Hub is fully operational, with the Board and staff recruited, the Hub may wish to consider contracting with existing organisations and partners such as the CITB, Constructing Excellence in Wales, CHC, Woodknowledge Wales, the BPN, and the GHA to deliver specific outputs/outcomes.

We would also stress that it will be essential to continue consultation with stakeholders over Summer 2021 to ensure that key organisations have plenty of opportunity to input into the Hub's Terms of Reference, project planning and set-up.

It is envisaged that by Autumn 2021 the permanent Board of Directors, Industry Steering Group and Hub team would be in place, and the Hub fully operational by then end of the year.

2021/22 Tasks

	Apr 21	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan 22	Feb	Mar
Preliminary tasks - Interim team												
Confirm Hub launch												
Confirm WG Year 1 funding												
Refine objectives and KPIs												
Secure pledges in principle												
Launch holding website												
Identify Board candidates												
Identify potential Hub team												
Identify Industry Group												
Recruit Board members												
Recruit Hub team												
Recruit Industry Group												
Introductory event												
Develop detailed project plan												
Stakeholder plan												
Raise industry support												
Year 1 tasks - Permanent team												
Establish legal entity												
Engage accountants/lawyers												
Plan future revenue streams												
Specify and build full website												
Website goes live												
Invite Pledges - all HAs/LAs												
Establish Industry Forums												
Commission research												
Training event												

Whole Life Carbon Assessment for Architects guidance 2019¹⁷ and the Welsh Home-Grown Homes project guidance for social landlords on embodied carbon 2020.¹⁸ That work would be highly relevant to the future Welsh definition of zero carbon and the extent to which embodied carbon would form a part of it.

Q 4.11 Should the Hub have a workstream to set a timeline for introducing a zero carbon standard for the Welsh Government?

Similar to Question 4.10, the Hub's Accelerator Projects and forums would provide information and findings relevant to the Welsh Government when considering how soon an official zero carbon standard could be introduced. The next review of Part L planned for 2023 is a key opportunity for input.

Q 4.12 Should the Hub have a workstream to provide technical support on building to zero carbon?

Yes, general technical support, but not technical advice on individual projects.

The Hub would collate technical guidance and research created by external experts and academics under themes on the website. For example, the recent Building Performance Evaluation Guide 2021 produced for the Home-Grown Homes project.¹⁹ It would signpost developers to such guidance and look across such publications for common themes and issues relevant to future policy and/or Hub workstreams.

The Hub would also signpost developers to companies (i.e. product manufacturers/solution providers) and individuals (i.e. consultants) who can provide technical advice for individual projects.

In addition, budget has been allocated for two Hub-commissioned research projects each year on topics prioritised by the Thematic Industry Forums, with sign-off from the Board. The research would be carried out by external expert consultants and published after peer review.

We also envisage the Hub having an important role in recommending research priorities for the Welsh Government on the zero carbon housing agenda and involvement in deciding funding allocations.

¹⁷ See [11241WholeLifeCarbonGuidancev7pdf.pdf \(architecture.com\)](#)

¹⁸ See [Embodied Carbon Guidance for Welsh Social Housing Developers, their design teams, contractors and suppliers - Woodknowledge Wales](#)

¹⁹ See [Building Performance Evaluation Guide – GHA Knowledge Base \(goodhomes.org.uk\)](#)

Q 4.13 Would the Hub have a workstream concerned with directly funding zero carbon construction projects?

The Hub would have a Thematic Industry Forum concerned with funding, finance and warranties.

One of the roles of this forum would be to identify and signpost on the website relevant funding sources e.g. for large-scale zero carbon demonstrators, major funding programmes, and potential lenders. As above, the forum would also be tasked with recommending research and funding priorities, collating learning from schemes delivered under major funding programmes, reviewing analysis on zero carbon construction costs (and potentially commissioning analysis on this topic), and understanding the impact of aggregators on costs. It is also envisaged that the Hub would have a role in future Government zero carbon housing funding decisions and allocations.

Q 4.14 Would the Hub have a workstream on the cost of building to zero carbon?

Yes. The Funding, Finance and Warranty Forum would also collate relevant analysis and research on the cost of building to ultra-low energy and zero carbon standards, and proactively seek out examples of where innovative aggregators such as that being developed by the Council Housing Development Forum are creating economies of scale and helping to bring down costs.

Q 4.15. Would the Hub have a workstream concerned with skills and training?

Yes, a dedicated Thematic Industry Forum, which would provide and promote training events in Wales, identify strategic skills and training priorities for Wales, and work with educators to fill technical knowledge and skills gaps.

In Year 1 it is also envisaged that one of the Hub's early industry events would have a zero carbon skills and training focus. This event would cover technical questions and would be delivered by subject experts. The materials produced would be added to the Hub's website for a wider audience.

Q 4.16 What legal issues could require consideration?

One of the early tasks of the scoping team would be to take advice on the processes for legally forming the Hub as a not-for-profit, registering with the relevant tax authorities, recruiting an

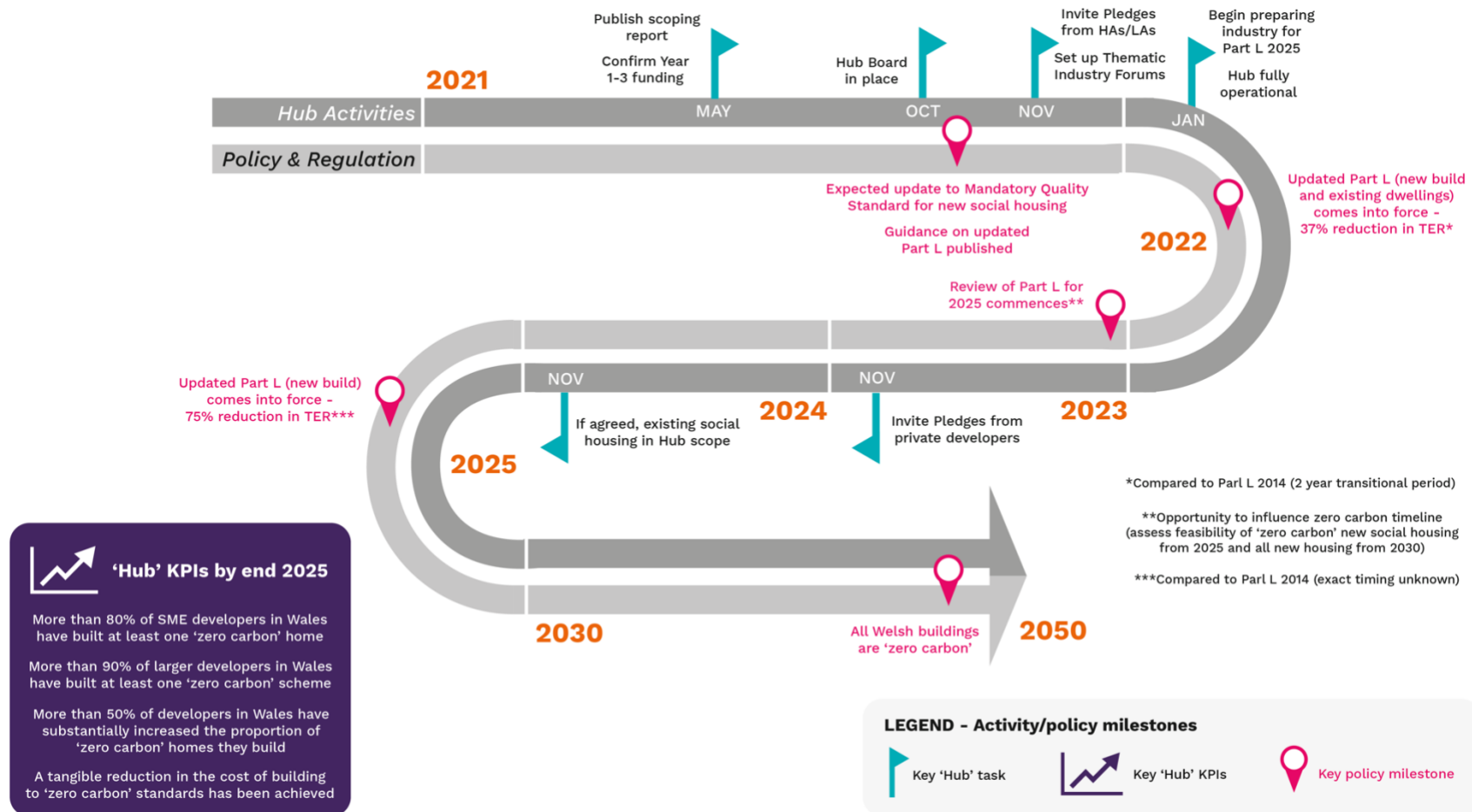
accountant and setting up an accounting system, and taking legal advice on, for example, disclaimers for the website, insurance needs and any potential issues of liability.

Q 4.17 What aspects of the Hub's activities would need translating into Welsh?

The Hub team needs to consult the Welsh Government on this question. Aspects of the website could be produced in Welsh, and the Annual Report could be produced in Welsh and in English provided there is a budget for the translation services.

Route Map

Below is an annotated infographic setting out the time frame for implementation of housing targets and standards, plus Hub activities.



List of Annexes

Annex A – Scoping Survey

Annex B – Literature Review

Annex C – Interviews and Workshop

Annex D - Finance



Scoping Report: Proposal for a Welsh Zero Carbon Housing Performance Hub



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