

Welsh Government Consultation Document Mandatory quality standards for new homes Response by Woodknowledge Wales

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SUMMARY

Our view on the proposed Mandatory Quality Standards for new homes:

- Wales has declared a Climate Emergency. We need to significantly reduce our carbon footprint. Construction accounts for over one third of carbon dioxide emissions.
- Standards need to include clear targets which all developers need to meet
- Standards need to be prescriptive but the way they are achieved should not
- Homes should be Net Zero Whole Life Carbon
- The production of homes should be a precision engineered manufacturing process rather than a building activity, with standardisation becoming a focus of delivery
- The call for sustainable low carbon homes needs to be based on specific targets so that the performance of those homes can be measured against national and international standards. We propose the following.
- A target needs setting for Upfront Carbon from April 2023.
We propose 300kgCO₂e/m².
- A target needs setting for Embodied Carbon from April 2023.
We propose 400kgCO₂e/m².
- A space heating demand target needs setting by April 2023.
We propose 15 kWh/m²/yr.
- A Total Energy Use Intensity target needs setting by April 2023.
We propose 35 kWh/m²/yr.
- All new homes should only use renewable energy
- Building Performance Evaluation (BPE) needs embedding in new home delivery
- Standards need to be performance rather than design focussed
- Standards need independent validation and certification at completion

Who we are

Woodknowledge Wales is an independent, not-for-profit, for-public-good, membership organisation with a vision for Wales as a zero carbon high-value forest nation. We:

- seek to inspire a movement capable of leading an expansion of forestry & wood-based industries;
- harness the collective spirit of businesses and organisations to put trees, timber processing and wood products at the heart of the green growth agenda;
- have an ambition to increase the market for wood, find ways to use wood better and to increase the supply and value of the homegrown resource.

Our ambition

Woodknowledge Wales is a change organisation with an ambition to transform the way we currently view our forests, timber processing industry and housing. We want to see a step change in performance and quality across these sectors and we believe that with the right policy interventions this transformation could be delivered within a generation. Imagine Wales as a high-value forest nation. A Wales with a large and expanding forest area with many more people with an economic interest in trees. A Wales with a dynamic timber processing and manufacturing sector which is fully integrated with an advanced timber housing industry. The benefits would be huge - a healthy and high-performance built environment, substantial climate change mitigation through zero carbon housing and expanded forestry, high-value employment (particularly in rural areas) and an economic win through reduced import dependency. Spin-off environmental benefits would be improved air, soil and water quality, reduced flooding and increased biodiversity. Other social benefits would include more cohesive communities benefiting from the multiple well-being aspects of trees, woodland and local timber utilisation enterprises.

Why we're responding to this call for evidence

This consultation invites a response to the first proposed change in new home standards in fifteen years. It's long overdue and comes at a time when Welsh Government wants to see a significant increase in the scale and pace of new home delivery, designed to meet more stringent carbon requirements, innovation in the way they are delivered, and all within a simplified regulatory regime. We are near to completing the Home-Grown Homes Project, a study of the timber construction supply chain in Wales and we have learned that

changing the way new homes are designed and delivered is fundamental to meeting our climate change obligations. And the combination of regulation and funding of new affordable housing supply is key to improvements in the as-built, as well as the, as-designed performance of homes.

Why we think change is needed

Context - a series of developments have served to emphasise the relevance and importance of the timber supply chain in meeting Welsh Government's current policy objectives including affordable housing:

- the influence of foundational economic thinking in policy development
- the declaration of a climate emergency
- the UK's decision to leave the EU and
- the coronavirus pandemic and public health crisis

These have all made the need to change more fundamental and urgent. Our contention is that this change needs to be profound, go much further than many would have predicted and needs to happen at a much faster pace. And in order to meet our carbon emission targets we need fresh thinking about the standards we set, how we regulate their achievement and how we encourage and support the actions needed to make the change.

We firmly believe that Welsh Government needs to move away from imploring the achievement of vague outcomes under headings like quality, innovation and sustainability. And pointing developers to good practice will not be sufficient. The answer is to set clear and unambiguous targets to reduce energy and carbon which pass the SMART test:

- Specific – expressing defined values for reducing carbon and energy.
- Measurable – which independent verification can determine.
- Achievable – the Innovative Housing Programme has shown how housing developers can produce schemes that meet challenging targets.
- Relevant – we need to respond to the climate emergency, foundational economics and the health and biodiversity crises.
- Timely – our response needs to be urgent.

Capacity and Capability - Wales has excellent foundations for the development of timber MMC homes. A strong Welsh manufacturing base has the capacity and capability to meet the growing calls for more manufacturing away from the weather, waste and imprecision of the building site to lead the way in creating

the off-site revolution – another clear ambition explicit in these proposals for new mandatory standards. The factory-based solutions offer up the potential to design, manufacture and test homes to much higher levels of energy performance – a huge challenge for traditional on-site production. These homes can be transported, assembled and finished on site to out-perform their masonry equivalent by providing warm and comfortable low carbon solutions which require little or no retro-fitting to meet future standards, which can be maintained easily and which are capable of easy adaptation to meet the changing needs of occupiers and which can readily adopt circular economy principles of resource efficiency.

Risk and reward - the encouragement to off-site manufacture and modern methods of construction (MMC) carries risk. We know there are a number of timber construction methods available in Wales which are capable of utilising Welsh grown timber in designs that deliver high thermal performance. Costs of systems vary widely but the cheapest open panel and twin-wall methods which are factory built are already mainstream; they can be manufactured using homegrown timber and can deliver Passivhaus levels of fabric performance. Developments and innovations are inevitable and will follow-on from wood science currently being carried out; glulam, closed panel systems and Cross Laminated Timber (CLT) offer potential step changes to construction in Wales. However, in 2015 the most modern closed panel production plant in Wales fell victim to the adversarial practices employed by contractors in the economic downturn and timber frame manufacturers are relying on small margins, uncertainty of flow through the factory, well-established problems with housing products which are non-standardised, and a lack of skills to build factory housing. So, building more housing whether on site or off-site won't deal with the structural problems of the housebuilding sector.

Standardisation - the move to offsite production is beginning to happen but at a very small scale and it is piecemeal, continuing as a marginal activity. Our project however has shown that a much more significant move to standardised, product-based housing production is entirely possible. We have:

- the raw material, more of which we need to divert into creating homes.
- a manufacturing industry capable of manufacturing to higher standards and
- the tools to achieve higher levels of energy and sustainability performance.

This is unlikely to happen without intervention. To see real transformation, the future will need to be less about building homes and more about manufacturing them.

Quality over quantity - we believe the current arrangements to produce affordable homes are broken and need fixing if we are to genuinely produce better quality homes. We do not share the view of the Review of Affordable Housing Supply Panel that a 'balance must be struck between increasing supply and providing quality adequate homes.' Our interest is to see a focus on quality before quantity. If we focus on quantity alone, we will fail to address the structural problems which exist in the chain of supply.

Timber fabric first - the role of the building fabric and choice of materials is critical to the quality and performance of a house. Materials have an effect on energy efficiency, indoor air quality, thermal comfort, moisture control (breathability) and acoustics. More use of timber in construction will help with meeting our Well-being Goals as it combines the qualities of a natural resource with the high performance of modern building materials. It can deliver innovative design, speed, cost and resource efficiency, health and wellbeing, and offers a path to a low carbon economy – in an industry dominated by the use of concrete and steel (materials responsible for almost 50% of the UK's industrial carbon emissions), timber has a much lower carbon footprint. We believe a thriving wood industry is a cornerstone of a sustainable society. It provides a valuable low carbon resource for industry and rewarding employment for many thousands of people. Well managed woodlands contribute to climate change mitigation, flood prevention, soil health, clean air, biodiversity and enables many forms of recreation necessary for our health and well-being.

Take a leaf out of Scotland's book - only 15% of the timber we use in construction is grown in the UK. The UK is the second largest importer of wood in the world after China. We urgently need to build many more houses and most of the efficient, low carbon and high-performance housing throughout the world is based upon wood. Using more wood, using more homegrown wood and growing more trees is good for our economy, our environment and our people. But timber housing in Wales is currently less than 25% of new build. We think Wales could match Scotland where timber construction accounts for over 80% of the new build market.

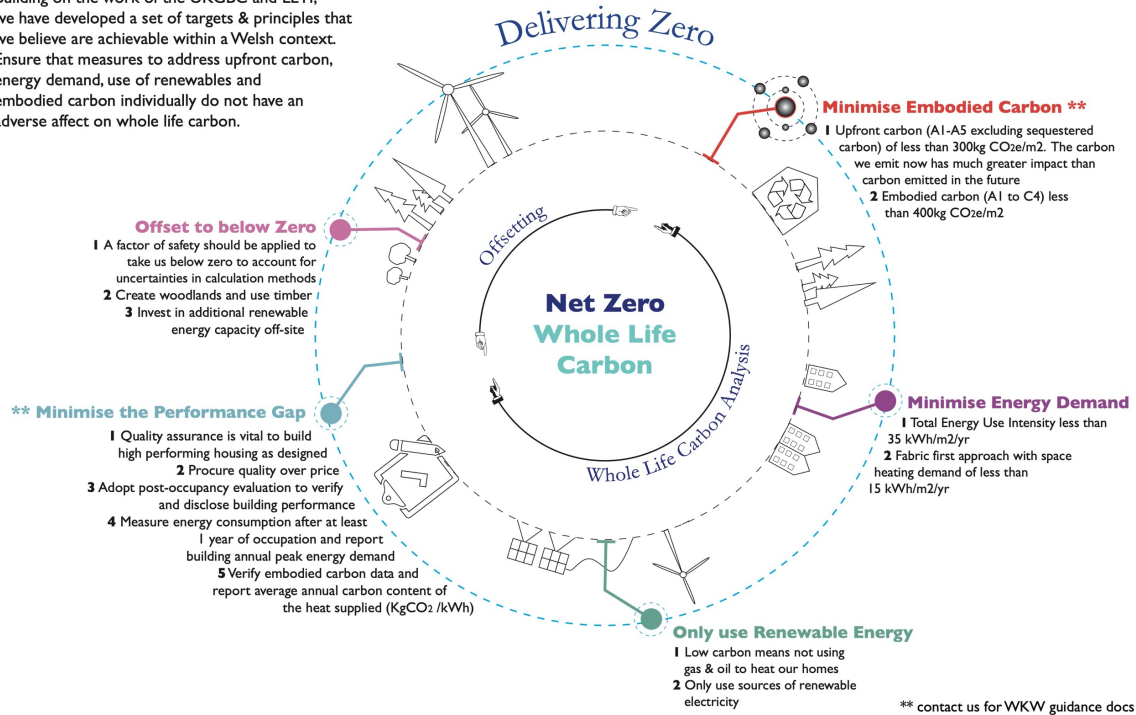
Our approach to mandatory standards

Woodknowledge Wales is in the fortunate position of being able to respond to this consultation with a series of well tested, evidenced and thought through proposals for WG to consider. Our study's conclusions are entirely pertinent to

these proposals on mandatory standards. We've done the research. Now it's time for implementation. The following diagram shows the kind of approach we envisage to achieve Net Zero Whole Life Carbon outcomes.

Net Zero Housing : Whole Life Carbon Guide

Building on the work of the UKGBC and LETI, we have developed a set of targets & principles that we believe are achievable within a Welsh context. Ensure that measures to address upfront carbon, energy demand, use of renewables and embodied carbon individually do not have an adverse affect on whole life carbon.



Projects that we have collaborated on to develop the above guide are shown on a Google Map which can be viewed [HERE](#).

We believe the mandatory standards should clearly set out and thereby enshrine the Welsh Government's ambitions and objectives in a range of its policy areas and include the following:

- **Better rather than simplified standards** - all countries are grappling with the challenge of decarbonising housing. With a co-ordinated approach, our research suggests that Wales can lead the world in what we now describe as Net Zero Whole Life Carbon Housing (NZH) – aligning with definitions developed by the World Green Building Council.
- **Making not building homes** - as part of our project we have created guidance for social housing providers, their consultants and contractors to deliver NZH optimised for Welsh manufacturing and the use of home-grown timber. By

adopting the guidance NZH housing can be affordably and reliably delivered in a way that will drive the development of Modern Methods of Construction, the offsite timber frame manufacturing and joinery sectors, support much more tree planting and inspire a renaissance in our forest industries. This is about seeing housing production as a manufacturing and not a construction activity.

- **Cutting carbon in new homes** - the use of timber in construction is a priority decarbonisation action recommended by the UK Committee on Climate Change. What is not recommended is greater use of high carbon materials such as steel, concrete, glass and plastic. Our research findings suggest that we should design for low whole life carbon (adopting circular economy principles) but, as it is vital to remove emissions today, a target should be set for Upfront Embodied Carbon (the largest component and simplest to measure and verify) and that this should apply from April 2023. We have collaborated with others to create Embodied Carbon Reduction Guidance for social housing providers and their supply chains to enable a standard method of assessment to support comparability of results. The Review of Affordable Housing Supply Panel accepted the views of the house building industry that 'a move to zero carbon is achievable if the market is given sufficient time to adapt' but saw no evidence that it would be possible to move toward near zero carbon by 2020. In our view that's because there has been no requirement to do so – so a target needs to be set. The Panel saw the value in recognising whole life building costs – something written into the proposed standard. We think it is more effective to recognise Whole Life Carbon underpinned by targets, harmonised measurement and design solutions which minimise this.
- **Setting Energy Targets** - a fabric first approach should be followed as a high-performance fabric reduces space heating energy demand. Occupants change, internal services evolve but the fabric should remain for the life of the building and can do the heavy lifting in terms of building performance. We concur with this view and believe that a target should be set for space heating demand of <15kWh/m²/year also by April 2023.
- **SAP review** - to better understand and articulate the importance of focusing on the fabric performance to deliver low space heating demand we have collaborated with others which has led us to an understanding of the need to review the use of SAP.
- **Fossil fuel finale** - all fossil derived energy should be avoided through use of energy generated from renewable resources.

- **Building Back Better** - buildings should be designed and delivered to achieve high performance with minimum performance gap. To deliver low energy high performance buildings we recommend embedding Building Performance Evaluation (BPE) methods and principles in the delivery of new homes. We have collaborated with others to create Building Performance Evaluation Guidance to support clients and their supply chains to implement BPE at design, delivery and post occupancy stages.
- **Learning Hub** - for learning, verification and performance benchmarking, all data should be transparently declared - such as upfront embodied carbon, energy consumption after 1 year of occupation and post occupancy evaluation data. All data should be fed back to a central learning hub to support data comparability and learning. We recommend establishing a Zero Carbon Performance Hub for this purpose.

Leading change through setting performance-based standards

For all our ambition to lead change there is only so much organisations like Woodknowledge Wales can achieve. Welsh Government should itself be leading change by setting standards that require social housing developers to meet defined targets in energy and carbon and by embedding the measurement of as-built performance. Whatever targets are set, we know that we don't build enough homes. The deficit of supply over demand gets worse. But the lack of homes is a primarily a political challenge not a technical one and that is another subject for a different consultation. The homes we do build must be fit for the future. That means we should focus on quality and by implication on process and procurement. The current approach to housebuilding relies on an approach where two thirds of the homes supplied in the UK are built by 10 companies in an environment where risk aversion, procurement practice, cost and adversarial relationships have driven down quality, lowered skills, driven out small and medium sized and local providers in a market where the needs of consumers come second to those of the producer. The approach is plan, design, build, sort out defects and then leave the occupier to live with a home the performance of which few appear concerned about.

Consultation Questions and our response

1: What are your general views on the proposed new policy with regard to the issues itemised within the above Summary?

We have set out an argument for new standards which focus on energy, carbon and measured as-built performance. Simplification can be achieved by setting clear targets.

2: What are your general views on the proposed new policy with regard to the “evidence for change” itemised within the above Summary?

New homes need to meet higher standards. For real progress to be made, change must not be at the speed of the slowest so targets need to be set which raise the game of the housing producers. Tenants have said this is what they want.

3: Do you think there are the benefits to the proposed new policy?

No, not as drafted. If the standards genuinely address some of the fundamental issues around energy, carbon and performance they will be part of a genuine transformation in the quality of affordable housing in Wales.

4: Do you think there are any dis-benefits to the proposed new policy?

As drafted these standards do not set sufficiently ambitious targets and so quality is likely to be the poor relation of quantity. In the desire for simplicity and less prescription, Welsh Government is likely to unshackle the creative and the genuine converts who understand the carbon and energy agendas. At the same time this is likely to introduce less certainty about what Welsh Government wants to see produced, in doing so risking a rush to the bottom in terms of quality, with minimum standards becoming maximum standards.

5: What changes (if any) do you think are needed to the proposed new policy?

We have set out a number of specific points in this response. In addition we don't think the Secure by Design standard is helpful, particularly as security is now included in Part Q of the Building Regulations. As Secure by Design is an independent standard we also question its legality as a mandatory requirement.

6: Do you agree or disagree that it is important for all affordable homes delivered through section 106 agreements and planning conditions to meet the proposed quality standards for new homes?

We believe there should be no distinction between producers and affordable housing standards, however they are procured. The social housing sector will lead the change and show that higher standards are capable of being provided

at little additional cost and are exactly what today's housing consumers expect in a home.

7: What is your opinion on the intention to adopt the proposed new policy for all housing irrespective of tenure.

The kind of standards we argue for should be tenure-blind – all new homes, irrespective of tenure should meet higher standards of energy, carbon and performance. In our view there is clear evidence that housebuilders who have a long-term interest in the homes they build (like social landlords) are much more prepared to invest in building to higher standards. They have a responsibility for the long-term maintenance of the asset and successive tenancies. Private housebuilders in contrast are only concerned with the first sale and have limited interest in the long-term life of the building or its use by occupants over time. Their mainstream product is not fit for purpose and research shows they will only act when regulation requires it.

8: What is your opinion of the proposed minimum space standard. Please explain and provide evidence for your views.

The Welsh Government needs to prescribe clear standards but allow developers to adopt the most appropriate way of meeting them. The proposed space standards are an example of this.

9: With the exception of the Lifetime Homes requirements, the proposed new policy is not prescriptive in relation to inclusivity & notably such matters as, disability, ethnicity, gender, sexual orientation, age, religion, human rights or children's rights. Do you consider the proposed policy is sufficiently inclusive or not? Please explain & provide evidence for your views:

No comment.

10: We are proposing to change the name of DQR to "Beautiful Homes and Spaces" (BHS). What is your opinion of the proposed name change and do you have an alternative suggestion

We do not feel that Beautiful Homes and Spaces reflects what the standards need to address and indeed sends the wrong message. We're in a climate emergency and construction is at the heart of our carbon challenge. It would be much more appropriate for DQR to become something like the Zero Carbon Homes Design and Performance Standards.

11: Subject to the outcome of the consultation on changes to the Building Regulations Part L (conservation of fuel and power) and Part F (overheating), new regulations will come into force. What is your opinion of the potential

early introduction of the conservation of fuel and power and overheating regulations for new affordable housing in advance of any building regulation transitional arrangements?

We don't yet know the outcome of the building regulations review but any delay in setting out the route to net zero carbon is to be avoided. We don't really believe that social housing should be held to higher standards than any other housing.

12: What is your opinion on the potential introduction of a requirement that all new affordable housing should meet EPC A (SAP 92).

The Passivhaus Trust publication 'EPCs as Efficiency Targets' (April 2020) concluded that 'the current Part L and EPC methodology means that an overall cost-based rating for the EPC, based on the notional building method, is the headline metric which is being used to try and drive energy efficiency. As the carbon emissions associated with expensive electricity continue to reduce, this makes the EPC rating system increasingly inaccurate and means that a highly rated dwelling could potentially produce a very high rate of emissions. Organisations seeking to drive improvements in energy efficiency should therefore use space heating demand as the primary metric, derived either from a SAP or PHPP calculation alongside the the EPCs cost-based index, in order to drive the sector towards buildings which are affordable, highly energy efficient and low in emissions'. We concur with this view.

13: We have asked a number of questions. We would welcome any other views you may have about the proposed new policy and the proposals for implementation

The 'performance gap' between the 'as designed' and 'predicted' performance of a house and its 'use' and 'operation' impacts significantly upon three key performance criteria – thermal (the efficiency of the fabric to minimise energy use for heating) and fire safety (the adequacy of passive fire protection measures to prevent the spread of fire, smoke and toxic gas) and health (particularly in terms of ventilation and indoor air quality). Performance is also about air quality, acoustics, lighting, moisture control and occupant health and safety. We talk about wanting to create homes which are affordable, but just as important are health and wellbeing, safety, security and accessibility – we need to define how we want new housing to perform once it's built. So, our response to the consultation's question about whether there should be changes to the standards governing the design and quality of affordable housing is YES, the focus should be on the quality of performance in use – but of all housing, not just affordable housing. This performance should be tested and checked and

independently validated/certified. All backed-up by Building Performance Evaluation as a regulated requirement.

14: We would like to know your views on the effects that the proposed new policy would have on the Welsh language, specifically on opportunities for people to use Welsh and on treating the Welsh language no less favourably than English. What effects do you think there would be? How could positive effects be increased, or negative effects be mitigated?

No comment

15: Please also explain how you believe the proposed new policy could be formulated or changed so as to have positive effects or increased positive effects on opportunities for people to use the Welsh language and on treating the Welsh language no less favourably than the English language, & no adverse effects on opportunities for people to use the Welsh language & on treating the Welsh language no less favourably than the English language.

No Comment

16: We have asked a number of specific questions. If you have any related issues which we have not specifically addressed, please use this space to report them.

We think Welsh Government needs to prescribe clear standards but allow developers to adopt the most appropriate way of meeting them.

17: In view of the effect of Covid-19 which will change the way we live in and use our homes, please indicate any additions to the standards and any other suggestions relating to the pandemic you want us to consider

Good indoor air quality is essential to good health. We know from post completion testing that actual ventilation rates rarely meet design intent. Incredibly for something so important, ventilation systems are signed off by the installer (and therefore not independently tested). Post completion performance checks of ventilation and indoor air quality is essential. Consideration should be given to harmful VOCs, particulates and moisture in particular. In the UK we have very limited labelling of construction products that off-gas. We draw your attention to the Royal College of Physicians report 'The Inside Story: Health effects of indoor air quality on children and young people' which made the following recommendations:

- *Set legally binding performance standards for indoor air quality that include ventilation rates, maximum concentration levels for specific pollutants, labelling materials and testing of appliances.*

- *Conduct air quality tests when construction is complete and before the building is signed-off*
- *Check compliance after construction stages and assess buildings once they are occupied and in-use. This may require greater, ring-fenced resources for Local Authorities to take effective enforcement actions.*

There is also a need for social housing providers to support residents to appreciate the importance of good indoor air quality to their health (but we appreciate that this is outside the scope of this consultation).

Woodknowledge Wales
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