

Proposed Domestic Building Environmental Standards (Scotland) Bill

Introduction

A proposal for a Bill to introduce new minimum environmental design standards for all new-build housing to meet the Passivhaus standard or a Scottish equivalent in order to improve energy efficiency and thermal performance.

The consultation runs from 4 May 2022 to 27 July 2022

All those wishing to respond to the consultation are strongly encouraged to enter their responses electronically through this survey. This makes collation of responses much simpler and quicker. However, the option also exists of sending in a separate response (in hard copy or by other electronic means such as e-mail), and details of how to do so are included in the member's consultation document.

Questions marked with an asterisk (*) require an answer.

All responses must include a name and contact details. Names will only be published if you give us permission, and contact details are never published – but we may use them to contact you if there is a query about your response. If you do not include a name and/or contact details, we may have to disregard your response.

Please note that you must complete the survey in order for your response to be accepted. If you don't wish to complete the survey in a single session, you can choose "Save and Continue later" at any point. Whilst you have the option to skip particular questions, you must continue to the end of the survey and press "Submit" to have your response fully recorded.

Please ensure you have read the consultation document before responding to any of the questions that follow. In particular, you should read the information contained in the document about how your response will be handled. The consultation document is available [here](#):

[Consultation Document](#)

[Privacy Notice](#)

I confirm that I have read and understood the Privacy Notice which explains how my personal data will be used.

About you

Please choose whether you are responding as an individual or on behalf of an organisation.

Note: If you choose "individual" and consent to have the response published, it will appear under your own name. If you choose "on behalf of an organisation" and consent to have the response published, it will be published under the organisation's name.

on behalf of an organisation

Which of the following best describes you? (If you are a professional or academic, but not in a subject relevant to the consultation, please choose "Member of the public".)

No Response

Please select the category which best describes your organisation

Third sector (charitable, campaigning, social enterprise, voluntary, non-profit)

Optional: You may wish to explain briefly what the organisation does, its experience and expertise in the subject-matter of the consultation, and how the view expressed in the response was arrived at (e.g. whether it is the view of particular office-holders or has been approved by the membership as a whole).

The Trust is an independent non-profit organisation that provides leadership in the UK for the adoption of the Passivhaus standard and methodology. Its aim is to promote Passivhaus as a highly effective way of providing high standards of occupant comfort and health without compromising on slashing energy use and carbon emissions from buildings in the UK. Improving efficiency is crucial to meeting Climate Action Targets.

Please choose one of the following:

I am content for this response to be published and attributed to me or my organisation

Please provide your Full Name or the name of your organisation. (Only give the name of your organisation if you are submitting a response on its behalf).

(Note: the name will not be published if you have asked for the response to be anonymous or "not for publication". Otherwise this is the name that will be published with your response).

UK Passivhaus Trust

Please provide details of a way in which we can contact you if there are queries regarding your response. Email is preferred but you can also provide a postal address or phone number.

We will not publish these details.

Aim and approach - Note: All answers to the questions in this section may be published (unless your response is "not for publication").

Q1. Which of the following best expresses your view of the proposed Bill? Please note that this question is compulsory.

Fully supportive

Q2. Do you think legislation is required, or are there other ways in which the proposed Bill's aims could be achieved more effectively? Please explain the reasons for your response.

To drive forward the change we need to address the climate emergency at the scale and speed required, we need clear strategies from Government to set agendas, shapes public discourse and mandate action, this is what legislation is able to deliver. It is essential that a firm and clear commitment is made to deliver Passivhaus or equivalent levels of performance for Scottish homes, this will allow the industry to invest in up-skilling staff and support the supply chains to develop their capacity and expertise in delivering these

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projects. We have all the tools and solutions at our disposal, we need to embrace these and make the changes we need for the future today.

Q3. Which of the following best expresses your view on setting the Passivhaus standard or a Scottish equivalent as the most appropriate new build housing standards to contribute to eradicating fuel poverty?

Fully supportive

Please explain the reasons for your response.

If we are to live within the means of our global system we need to radically reduce energy demand and drive efficiency. We cannot simply generate more zero carbon energy supply, due to the limitations of grid capacity, peak load and demands for renewable energy from other sectors.

Passivhaus buildings are optimised for net zero and meet the predicted capacity of our future decarbonised grid. Passivhaus delivers outstanding levels of building performance, typically using half the energy of a new-build home. It therefore enables the levels of demand reduction that we will need in order to achieve net zero nationally and globally. Passivhaus also provides exceptional levels of interior comfort, health and wellbeing, affordability, resilience and durability. Making it the most appropriate standard to set when looking to eradicate fuel poverty.

Q4. Which of the following best expresses your view on setting the Passivhaus standard or a Scottish equivalent as the most appropriate new build housing standards to contribute to a reduction in emissions?

Fully supportive

Please explain the reasons for your response.

Passivhaus is an international tool backed by 30 years of evidence, it provides us with a range of proven approaches to deliver new and existing buildings optimised for net zero. This is no time to reinvent the wheel - the tools we need to deliver on our climate pledges exist today, so let's get to work! The Passivhaus standard provides solutions to the current hurdles to achieving net zero in the UK.

1 - The performance gap

Passivhaus buildings have been consistently shown to perform to design targets with no performance gap between predicted and actual energy

use. By contrast the performance gap in non-Passivhaus new-build homes is well documented and a conservative estimate of its size is 60% additional space heating demand.

2 - Seasonal Disparity & Renewable energy needs

The seasonal disparity between energy demand and renewable generation results in a need for inter-seasonal energy storage, which will lead to storage losses. A Passivhaus will require less energy, so require less storage resulting in few storage losses. Overall a home built to building regulations will require twice as much renewable energy as a Passivhaus home of the same size.

3 - Grid Capacity

Passivhaus also meets the predicted capacity of our future decarbonised grid. There is a limit to how much renewable energy can be deployed and managed through the national grid. As it is decarbonised, there is an increasing case to use more electricity for heating purposes. The total amount of renewable energy we can generate over the course of each year is not the only limiting factor. Perhaps more of an issue is the peak load that the national grid is able to deliver.

It is estimated that the peak thermal load currently demanded by our homes and delivered by gas is 170GW. The current electric grid capacity is around 100GW. In 2045/50, all our sectors, particularly transport, will be drawing from this source of low carbon energy and thus the share that can realistically be allocated to domestic heat will be a small fraction of that. Again, demand reduction is going to be needed to enable us to achieve a net zero balance.

To make a decarbonised grid work we need heating loads, and critically peak loads, to reduce to Passivhaus levels of building performance, to allow us to make this switch to electrical heating and so realise the reduced emissions that the decarbonisation strategy envisages.

4 – Load Shifting

In all future scenarios we need to reduce our peak load. In our buildings we can do this using demand

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response and load shifting to spread the peak out over the day. In a typical home, with a daily periodic temperature swing, the heating input cannot be shifted, as the house will not be warm when required. In a Passivhaus the heat can be input at any time of the day, as the internal temperature remains constant. This home acts as a thermal store, so we can quite happily load shift around the day, reducing the demand at peak times.

An efficiency first approach is crucial. Passivhaus is the most effective and robust way to achieve the necessary energy reductions.

Q5. Which of the following best expresses your view of the process set out to ensure that the new standards are met in all new build housing? (see pages 14 to 16 in the consultation document)

Neutral (neither support nor oppose)

Please explain the reasons for your response, including your views on how effective the process would be in removing the 'performance gap' and on how the proposed verification process might work in practice.

We agree with the proposals, with the inclusion of the Passivhaus Planning Package (PHPP) are an alternative methodology to SAP to show compliance with Section 6 (Energy).

In order to achieve the Passivhaus Standard, a project must clearly demonstrate that it meets the validated quality assurance requirements. This includes the requirements listed by the International Passivhaus Institute (PHI); reference must also be made to any other requirements or guidelines currently set by PHI. The Passivhaus Trust recommends that the best way to demonstrate that the quality assurance requirements have been met is through certification by an accredited Passivhaus Certifier. A project can only claim to be Passivhaus certified and use the Passivhaus badge/ plaque if it has gone through independent certification.

It is reasonable to claim that a building is a non-certified 'self-declared Passivhaus' provided that it still meets ALL the requirements of the standard. This would allow Building Control officers to approve projects based on the Passivhaus performance requirements, without requiring all projects to be certified. Clients would still be able to seek external 3rd party certification, if they wish. Meeting ALL of the requirements is necessary as this guarantees that the full range of Passivhaus benefits will be delivered to the clients/ occupants in terms of energy and comfort.

Q6. What could be the market effects of the introduction of this proposal?

RICS highlight that higher build quality, potentially lower finance costs, lower running costs and general comfort improvements should also be considered as part of the valuation. These considerations apply to energy-efficient homes generally but are likely to be even more pronounced for a home certified to Passivhaus - because it's the highest standard of energy efficiency, and because the rigorous certification process guarantees performance.

Research done for the EC has found that there is some evidence to suggest that "better energy performing buildings show shorter vacancy periods, have a lower loss of rental income due to changing tenants and... show a more positive operating impact for the owner".

By contrast cheap, low-quality buildings have significant additional costs associated with:

- Higher defects
- Legal action from clients/ buyers/ residents
- Health and Safety issues
- Overheating complaints
- Complaints of draughts and cold homes

With good ventilation and thermal comfort, Passivhaus premises certainly offer conditions for better staff health and productivity. Additionally, low running costs mean the net benefit is even greater: a win-win for commercial tenants and owner-occupiers.

In their book, 'Healthy Buildings' Joseph Allen and John Macomber argue that "healthy buildings represent one of the greatest businesses opportunities ever."

In their TM40 standard for healthy indoor environments, CIBSE points out that alongside immediate productivity, employee perceptions and satisfaction with the workplace matter. "These can influence

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motivation...and retention [which] can translate into large benefits for organisations."
There are also opportunities for Scottish businesses to develop Passivhaus components and materials as well as MMC for the delivery of these homes.

Financial Implications

Q7. Any new law can have a financial impact which would affect individuals, businesses, the public sector, or others. What financial impact do you think this proposal could have if it became law?

a significant reduction in costs

Please explain the reasons for your answer, including whom you would expect to feel the financial impact of the proposal, and if there are any ways you think the proposal could be delivered more cost-effectively.

This answer depends on who we are considering. The cost to individuals in homes will be significantly less due to lower bills. The cost to build these homes will be slightly more, projected to be around 4-8% reducing as the sector up-skills and supply chains adjust to the new construction techniques. Passivhaus buildings have access to Green Finance, whole life cost savings and reduced maintenance costs due to the high quality construction. Research also shows Passivhaus homes have lower management costs with shorter vacancy periods and reduced rent arrears.

Equalities

Q8. Any new law can have an impact on different individuals in society, for example as a result of their age, disability, gender re-assignment, marriage and civil partnership status, pregnancy and maternity, race, religion or belief, sex or sexual orientation.

What impact could this proposal have on particular people if it became law? If you do not have a view skip to next question.

Please explain the reasons for your answer and if there are any ways you think the proposal could avoid negative impacts on particular people.

There are many interconnected social benefits from Passivhaus construction. These include better comfort and wellbeing, improved mental and physical health, education and skills attainments – which in turn may benefit the economy and society. Passivhaus effectively eliminates fuel poverty, with positive health outcomes from better quality housing consistently strongest among vulnerable groups, including children, the elderly and those with pre-existing illnesses.

Sustainability

Q9. Any new law can impact on work to protect and enhance the environment, achieve a sustainable economy, and create a strong, healthy, and just society for future generations.

Do you think the proposal could impact in any of these areas? If you do not have a view then skip to next question

Please explain the reasons for your answer, including what you think the impact of the proposal could be, and if there are any ways you think the proposal could avoid negative impacts?

Passivhaus buildings are optimised for net zero and meet the predicted capacity of our future decarbonised grid.

If we are to live within the means of our global system we need to radically reduce energy demand and drive efficiency. We cannot simply generate more zero carbon energy supply, due to the limitations of grid capacity, peak load & demands for renewable energy from other sectors.

Passivhaus delivers outstanding levels of building performance, typically using half the energy of a new-build home. It therefore enables the levels of demand reduction that we will need to achieve net zero nationally & globally.

Passivhaus also provides exceptional levels of interior comfort, health and wellbeing, affordability, resilience and durability. Passivhaus enables a cost-effective, and fair, transition to electric-based heating – which is what we need to support our national transition to net zero.

General

Q10. Do you have any other additional comments or suggestions on the proposed Bill (which have not already been covered in any of your responses to earlier questions)?

Research has shown that there are wide ranging benefits associated with building to the Passivhaus standard, when built or retrofitted to this rigorous quality assured standard buildings:

- Deliver outstanding levels of building performance
- Support our transition to net zero
- Offer exceptional levels of comfort
- Provide optimum conditions for productivity and learning
- Offer significant whole life cost savings
- Protect vulnerable members of society from fuel poverty
- Support positive health outcomes
- Deliver a robust return on investment in terms of environmental, social and economic benefits

In the context of the Climate Emergency, we must utilise the technology and tools already available to us, to make a meaningful step forward in our journey to Net Zero. Our approach to both our new buildings and the retrofit of our existing stock in Scotland must be ambitious and inclusive. The Passivhaus Standard gives us a range of approaches making it widely applicable across all building typologies. It is already being applied widely across the education estate in Scotland and we support this bill to legislate for this to become mandatory for all new homes.