

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

Commercial organisation (company, business)

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).

Architecture & sustainability design consultancy services, with specialism in Passivhaus design & delivery

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).

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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

Please explain the reasons for your response.

We fully support the proposed Bill as we believe the rigorous evidence based Passivhaus Standard is the optimal way to reduce energy demand for new-build construction and so be a significant contributor to a more sustainable society as outlined in response to the other questions in this survey.

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.

Legislative change will be required to support the required changes to the assessment, inspection and verification processes currently undertaken by the Local Authorities as Verifiers. These changes are in

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the public interest and should be considered a necessity for the Scottish Government to comply with The Building (Scotland) Act 2003 by ensuring the adequate continuation of the remit set out within this Act i.e. the welfare of those using or affected by buildings, the conservation of fuel and power, and the achievement of sustainable development. Anything less than mandating the PH Standard falls short of this remit in relation to energy efficiency, thermal performance and comfort and wellbeing.

The Building (Scotland) Regulations will require to be updated to mandate new standards that include all Passivhaus criteria in relation to energy efficiency and thermal performance (including airtightness and ventilation). We would propose this is undertaken by updating the current relevant sections of the Technical Handbooks.

The Building (Procedure) (Scotland) Regulations 2004, as amended, will also require to be updated to ensure that adequate pre-assessment at Building Warrant Application stage, inspection of works and overall verification procedures are updated to align with the requirements of the new standards.

The Energy Performance of Buildings (Scotland) Regulations would require to be updated to ensure that EPC's can provide adequate and accurate information to building owners regarding the predicted energy use and emissions of the assessed building. Additionally, the accepted methodology for producing EPC's will need to be updated to include a different calculation method.

Changes to legislation should not present an insurmountable barrier to adoption of new standards, particularly when the adoption of those standards is in the public interest. Other countries and cities have adopted the PH Standard at a legislative level, e.g. Brussels City Region, demonstrating that this is possible. If the political will is there, then the legislation can be updated to reflect the required changes.

Evidence shows that legislative change is the only method for raising standards across all sectors and assisting with creating replicable solutions to current issues, such as the performance gap in building energy performance. Reliance on voluntary adoption of higher standards does not lead to rapid or widespread change on the scale that the climate and ecological crises require.

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.

Households that are either in fuel poverty, or on the cusp, cannot afford to adequately heat their homes. This creates issues for the building fabric in the form of increased condensation and mould formation, as well as increased temperature swings. These physical manifestations of inadequate heating are then directly related to the health and wellbeing of those occupants in relation to development or progression of certain physical conditions, as well as issues with financial security and mental well being. This contributes at a societal level to increased medical costs.

By mandating the construction of higher quality buildings to the Passivhaus Standard we could lower the running cost of all new buildings to a sufficient level that fuel poverty will be significantly reduced across the country for any occupant of a new building. Although out with the scope of this Bill, the same effect could be achieved with a National Retrofit Standard for existing buildings as the principle remains the same: less money spent on operational energy results in more income remaining with the householder or owner, thereby increasing the likelihood they can and will adequately heat their home.

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

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?

Please explain the reasons for your response.

Mandating buildings with a significantly reduced operational energy demand leads to a direct reduction in emissions for two reasons: (a) less energy is required in the first instance therefore all emissions, from source to point of use, associated with that energy are reduced; and, (b) energy efficient buildings are more compatible with small-scale renewable technologies and so help to distribute the demand loading across the grid by lessening the burden across the energy network at a national level. The emissions associated with operating the national energy network are significant; any reduction we can make to these reduces the emissions budget required for the construction section and helps to alleviate pressure on other, harder to treat systems (such as transport).

Often low energy buildings go hand in hand with reductions in emissions relating to embodied energy: the Passivhaus Standard is very compatible with sustainable building materials and systems, such as timber frame (already prevalent in Scotland) and natural fibre-based insulation materials, or wood-based board materials that can provide airtight and vapour control layers as well as a structural purpose within a construction. These materials and systems are also beneficial for the building occupant's health and well-being by significantly reducing VOC's and creating demountable construction that is compliant with circular economy principles.

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)

Partially supportive

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 principle that Planning Permission should be an integral part of the approval process in demanding Passivhaus compliance at the earliest statutory stage possible in a project. Issues such as form factor, orientation, shading, fenestration, and potential for site issues such as noise or pollution to prohibit adequate ventilation, etc. all play a part in the successful design of a Passivhaus compliant building and are all currently covered directly or indirectly by the Planning process and associated legislation.

We selected 'partially supportive' as we think there is an aspect of the demonstration of compliance missing from the diagram on Pg. 15.

We believe that compliance could remain with the Verifier rather than with an independent party on the condition that the Technical Handbooks be sufficiently updated, and the compliance methodology either changed to match the calculations of the PHPP, or, if that were not viable a PHPP calculation accepted in lieu of a SAP / SBEM calculation. PHPP has been evidenced to be more accurate in predicting energy use and thermal comfort than the current versions of SAP or SBEM.

Verifiers are uniquely positioned to assess not only Section 6, but the regulations covered by Section 6 in conjunction with the other relevant Sections of the Technical Handbooks, such as Sections 2 Fire and Section 3 Environment. If the assessment of compliance for energy related items were removed from the Verifier but the other sections were to remain with them this could lead to unnecessary complexity. However, for the performance gap to be eliminated and buildings to be constructed to reflect new robust design criteria, verifiers need adequate resources and upskilling.

The Quality Assurance process delivered by a Certified Passivhaus project relies on information gathered not only at the design stage, or upon completion, as outlined in the proposal, but also throughout the construction phase in the form of photographic evidence of compliant insulation installations, key junctions to demonstrate a lack of thermal bridging, intermediate airtightness testing, etc.. None of these issues would be out with the scope of the current Verifiers if they were adequately upskilled (knew what to look for) and were adequately resourced (had the time to collate the information with the applicant or agent).

One proposal to retain the new more robust standards within the current verifier arrangement would be to nest any additional design responsibilities within the existing Section 6 Certification Scheme.

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)

The Section 6 Certification training could be updated to include a module on PHPP use, and Passivhaus Design. Qualified Section 6 Certifiers could then be considered adequately trained and qualified in the relevant energy efficiency and thermal performance standards of Passivhaus design; alternatively independent qualification as a Passivhaus Designer could become a pre-requisite of the Section 6 scheme membership and considered adequate training to cover these aspects.

The virtual mandating of a Section 6 Certificate for all new buildings could follow the same procedure as the Section 1 SER Certification scheme from a verifiers perspective; since all liability lies with the designer in any event (BW being a permission to build, and Completion Certificates being a declaration by the Relevant Person the permission has been complied with), this would not unduly increase the burden on the Verifiers, beyond the reasonable expectation that they are adequately upskilled to assess applications in relation to updated Building Regulations.

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

The principal objection from the current large scale building companies is one of prohibitive cost to business / skills shortages. Even if this were accurate, which we don't believe it is, this argument does not have sufficient weight to counter the necessary changes required to ensure our new build construction complies with the wider legislative high-level strategies the Government has set out recently, or effectively combat the climate crisis.

The running costs to operate a Passivhaus building are minimal: this is partially offset by initial capital investment in higher levels of insulation etc., but this often leads to an overall lower cost over the life cycle of the building. This could benefit the housing market by making Passivhaus more attractive to purchasers and benefit the construction market by improving the reputation of those constructing higher quality, more robust buildings.

The methods, materials and skills already exist in Scotland (and the UK) to construct buildings to the Passivhaus Standard, as exemplified by the many Certified Passivhaus buildings in existence today. Improving the Building Regulations to this standard will only serve to increase the quality of the construction sector, and so could have a positive effect on this section of the market; by promoting better standards pride in work increases and the end user benefits from an improved quality of life.

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?

some increase 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.

The additional costs to the market can be borne by a combination of subsidy (grants, or interest free loans, such as those currently available for renewable technologies for example) for those least able to deliver the required buildings, and by the private market for those financially able to do so.

The additional construction cost for a Passivhaus building is currently estimated at c.4% - if the Standard were widely adopted through regulation this would reduce rapidly due to increased uptake and repetition of solutions. The cost to retrofit to the same standard once a building has been constructed however can be over 5 times this. The current need for a National Retrofit strategy is urgent: why would we exacerbate that by constructing new build at this moment in time that will, soon, require retrofitting.

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.

The proposal could positively impact on those members of society who have challenging living conditions or are on a low / limited income. By improving the quality of new build construction there is a direct benefit to the occupants of those buildings by reduction in condensation, mould formation, and temperature swings. Better living conditions allow less money to be spent on heating and lighting, leading to less people in fuel poverty, a better quality of home, and so less people living in sub-standard accommodation.

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?

The proposal could assist in achieving all those things (a sustainable economy, and a strong, healthy, and just society for future generations). Refer answers to previous questions for reasons.

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)?

The Passivhaus Standard is an evidence and performance-based standard, with specific empirical criteria. As such the most robust way to deliver the standard is by adopting it, instead of either seeking to change it to a 'Scottish equivalent' or adopting only parts of it, such as thermal performance in isolation from ventilation for example.

The Government aim for 'ultra high levels of efficiency' does not equate to their other proposal to demand a minimum EPC of 'C' for new build construction. Setting the bar at EPC 'C' is too low, and further complicated by the failings of the current assessment methodology (design being evaluated in comparison to a notional building rather than an individual building calculation, and an EPC rating being cost based index linked to fuel type, rather than an independent appraisal of energy used).

SAP & SBEM currently contain too many failings. Inadequate entries for orientation, shading, overheating risk, and building measurements, as well as the exclusion of energy demand not related to heating or lighting all contribute, amongst other things, to a lack of realistic assessment at the design stage.

Additionally, the encouragement of off-setting via renewable technologies such as Photovoltaics before a

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'fabric-first' approach also contributes to the evidenced performance gap between buildings designed to current Regulations and their actual performance.

Should the PHPP be adopted as a compliant methodology an adjunct software or plug-in could be developed to generate an EPC that reflects the individual building assessment. Use of such tools could be regulated under the existing Section 6 Certification scheme.

Fundamentally it must be noted that a building that only just meets the Regulations is simply the worst building it is legally permissible to build – raising the standard of the legal minimum for new build construction is the best method of ensuring that the built environment sector limits its contribution to the overall national emissions and energy consumption to an acceptable level.