

# 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)

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).

ROCKWOOL UK Ltd

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.**

ROCKWOOL Ltd fully supports the proposal to make building regulations on energy efficiency more ambitious in Scotland and set a Passivhaus standard. Building to a Passivhaus standard offers occupiers not only a saving on energy consumption, which is increasingly important in an era of rising energy bills, but also more comfortable indoor environments with better air quality and reduced noise.

It is clear that the performance gap between the promised and in-use performance of housing and other buildings is a significant issue in Scotland and other UK nations. Adopting a Passivhaus standard should help address this providing the assessment and certification processes are of a high quality.

There are a growing number of Passivhaus projects being constructed around the UK which use mineral wool insulation such as Preston Springs, Silken Park and Denby Dale. These homes are assessed more rigorously by developers than more typical housing delivery models – in particular on getting the (often non-typical) design details exactly right on site, and checking the home's performance from inception to completion, and frequently after handover too. The result is that the homes are much more likely to function in line with their design performance, including in terms of the air quality, internal temperatures and acoustic performance, compared to more typical housing delivery models.

A similar focus on quality and checking of details needs to be replicated if Scotland were to adopt a Passivhaus standard across the board. Such stringent quality control is necessary because as target U-values get lower for walls, roofs and floors, and other aspects of the building, the consequences of thermal bridging, thermal bypass, and other issues associated with a lack of continuity in the insulation layer (gaps and airtightness failures) become more apparent and can be more damaging.

While this bill concentrates on new build residential buildings, we also support the ambition to extend it to retrofit in the future. The EnerPHIT standard developed by the Passivhaus Trust could be used in these

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contexts, as Portsmouth City Council recently did in their renovation of Wilmcote House, a 1960s high rise residential block. Renovating Wilmcote House to EnerPHIT standard made a significant difference to residents, who enjoyed higher winter flat temperatures following renovation despite a major reduction in energy use, and energy bill savings of £700 a year on average. Choosing a high standard retrofit also benefitted Portsmouth City Council as the asset owners. The overall cost of the scheme, at around £117,000 per flat, was cheaper and less disruptive than demolition and rebuilding. Meanwhile the flats are now valuable assets with a 40 year extension to their life.

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.

Adopting a Passivhaus standard in Building Regulations is currently within the scope of Ministerial power as defined in the Building (Scotland) Act 2003 and can be achieved without primary legislation. However, given the urgent imperative to take action on reducing emissions, and the crucial role regulations will have in pushing for more ambitious performance in buildings, we understand why MSPs are proposing this approach and are supportive.

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?

Partially supportive

**Please explain the reasons for your response.**

Homes built to a Passivhaus standard will likely be much cheaper to run than those built at currently proposed standards, or of the current building stock. Following the renovation of Wilmcote House in Portsmouth to EnerPHIT standards, resident's bills reduced by an average of £700 per year. However, more will need to be done across the existing housing stock to reach many of those living in fuel poverty in Scotland. While data on the profile of residents of new build homes is not available, the Scottish Housing Survey shows that only 17% of those who do "not manage well" financially are owner occupiers or private renters. Meanwhile the Scottish Housing Statistics show that only 24.4% of new homes completed between October and December 2020 were built by Local Authorities or Housing Associations, with the remainder built for private use. Similarly in England we can see that 82% of those living in homes completed after 1990 are owner occupiers or private renters. So the impact on fuel poverty of adopting a Passivhaus standard is unlikely to be far-reaching unless it is expanded to retrofitted homes also.

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?

Partially supportive

**Please explain the reasons for your response.**

The Passivhaus Trust estimated in 2019 that Passivhaus homes would contribute less than half the emissions of homes built to current Building Regulations. It is therefore highly likely that there would be a significant reduction in emissions compared to new build homes currently being built. However the majority of Scotland's building stock will continue to be overwhelmingly much older and leakier. BRE have estimated that only 18.3% of the housing stock in Scotland was built after 1990. The Office for National Statistics have used Energy Performance Data to show that the age of a property is the single biggest factor in its likely energy efficiency. The ONS estimate that homes built after 2012 in England are almost 200 times as efficient as those built between 1930 and 1982, rising to around 300 times more in Wales. Although this data is for England and Wales only it is unlikely that the profile of the Scottish housing stock will be significantly different. This means that while improving the standard of new build homes will make a difference to the emissions

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of newly built homes, to make a significant contribution to reducing emissions it will be necessary to apply the bill to retrofitted properties also.

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 support the proposal that inspection of the dwelling take place before approval by Building Control. However given the existing skills gaps in the construction industry it will be important to ensure enough qualified certifiers can be trained in time for the legislation to take effect.

With regard to the impact of this on the 'performance gap', it is our view that Scotland should introduce operational targets into the Building Regulations to close the gap between as-designed and as-built performance, as well as requiring verification of compliance through appropriate monitoring and reporting mechanisms, both pre- and post-occupancy. This we believe would help to both deliver best practice and close the gap between as-designed and as-built performance.

Quality control in the construction process, verification of actual building performance, and designer and installer training, skills and accountability are all important areas that require major improvement before much tougher standards become the norm.

Once substantially tougher standards are in place it will be more important than ever to guard against the potential for build issues and errors. Even small problems can have significant unintended consequences. Thermal bridges account for 20% to 30% of the heat loss in a typical new build home, and as the fabric becomes more efficient and airtight, the greater the impact of thermal bridging becomes. This is why we must ensure that future buildings are built with excellent attention to detail, with good air tightness and low thermal bridging.

Fabric performance, in particular, is highly sensitive to the quality of workmanship. Failure to use the right quantity of insulation, failing to properly address gaps and thermal bridges, or disturbing insulation in the loft, can significantly reduce performance, potentially resulting in non-compliance with Building Regulations and lower than expected energy and carbon savings.

There are a number of major building research programmes, industry collaborations, and recent initiatives taking aim at specific systemic issues often seen in buildings. These include the "energy performance gap", problems with indoor air quality and overheating. A growing number of construction sector organisations are actively seeking and finding solutions to these issues and as a result, they are seeing their housing schemes perform very well.

Such organisations are:

- Investing in building performance evaluation projects which look at the performance of buildings holistically;
- Investing in performance verification methods and tools enabling them to prove to buyers that a building "does what it says on the tin"; and
- Investing in robust quality control and building physics training so their teams and supply chains are better able to avoid the types of mistakes in the build process which create operational performance problems and unhealthy indoor environments

By continuing to invest in such solutions, the sector will be in a much better position to give house buyers of the future robust assurances about the quality and resilience of housing schemes, if called upon to do so.

However, with the exception of airtightness testing, at present Scottish regulation does not oblige the supply chain, including manufacturers, to demonstrate that new buildings perform as they should in use. There is no final report handed over to a house buyer to outline the quality control processes enacted as the build took place and no test required to show that a home should perform to the standard required. As a result, only a very small proportion of the new build stock is currently benefitting from the types of verification processes outlined above.

Currently, Passivhaus projects tend to "work" because there is a laser-sharp focus on getting the (often non-typical) design details exactly right on site, and checking the home's performance from inception to

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)

completion, and frequently after handover too. A similar focus on quality and checking of details needs to be replicated if Scottish frameworks and standards change to Passivhaus across the board.

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

We believe there would need to be a major shift in the way new homes are procured, designed and constructed before the proposed introduction of a Passivhaus standard could be delivered at scale. Many mainstream developers will likely need to develop entirely new scheme designs, built forms, combinations of materials and frames, and fabric element build-ups. There could be issues associated with a very limited choice of products (in addition to supply chain constraints) and potential risks with builders using construction techniques and products not familiar to them. It is vital that the way standards are set through this bill does not lock the supply chain into a narrow set of solutions, causing innovation and investment into transformative alternative approaches to building to dry up. It is equally important in the short-term for the framework to allow for the use of the full range of construction approaches, including timber frame, steel frame and masonry, recognising that timber frame is especially prevalent in Scotland. The timescale over which a Passivhaus standard would be introduced is therefore of crucial importance. Our view is that it would take a number of years, perhaps five at a minimum, before the sector could be ready. Such a period could be officially declared as a "preparation period", with the construction sector, including manufacturers, fully incentivised, and supported through tax breaks, grants or other measures to ensure they can achieve such targets, as well as interrelated areas such as fire safety, acoustics, indoor air quality, and internal temperatures. Once construction teams are consistently delivering robust in use performance on a relatively small scale to moderately improved targets, there can be a much higher expectation of success. It is easier to build 100 robustly quality-controlled low-energy homes and then scale that learning, than everyone having to learn on thousands of new homes. The cost and deployment of real performance evaluation technologies would also be exposed to market forces on a small-scale potentially driving some cost reductions before being applied in larger numbers.

## 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?

[Skip to next question](#)

## 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.

*No Response*

## 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 proposals put forward in this consultation have the potential to make a significant positive contribution to work on protecting and enhancing the environment, achieving a sustainable economy and creating a strong, healthy and just society for future generations.

The delivery of highly energy efficient homes will lead to reduced carbon emissions, compared to business as usual, and improved air quality through reductions in fuel combustion for heating either of natural gas or oil and solid fuels for homes not connected to the gas grid.

Using robust insulation materials that perform consistently over time means fewer future interventions are necessary leading to lower resource demands over time and long term carbon emission savings from consistency of performance.

Lowering energy demand from new homes also relieves pressure on the delivery of renewable energy generation to replace more carbon intensive generation technologies.

Delivering homes with strong thermal and acoustic performance would have a significant positive impact on the long term physical and mental health and wellbeing of the occupants. Nuisance noise is second only to air quality in terms of the impact on public health and living in cold homes is associated with higher rates of respiratory disease and can impact on educational attainment.

The introduction of a PassivHaus standard for new homes sends a clear signal of commitment to give confidence to the construction supply chain to invest in upskilling their workforce to deliver houses to that standard. Growth in these 'green skills' will be necessary to tackle the significant challenge of decarbonising buildings on the journey 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)?

No