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# SPF Consultation Response

Stage 1 consultation on  
determining the principles for a  
Scottish equivalent to the  
Passivhaus standard.

Submitted on 23 October

## SCOTTISH PROPERTY FEDERATION

The Scottish Property Federation (SPF) is the voice for the real estate industry in Scotland. As a part of the wider British Property Federation, we include among our members: property investors, including major institutional pension and life funds; developers; landlords of commercial and residential property; and professional property consultants and advisers. Our members build Scotland's workplaces, homes, shops, schools and other facilities and the infrastructure that serves them. Our industry is therefore a core component of the Scottish economy.

## CONSULTATION SUMMARY

The Scottish Government are seeking views on whether to implement a **mandatory variant of the Passivhaus Standard** for all domestic and non-domestic buildings.

This consultation has two parts; this first section focuses on determining the principles, form and technical aspects of a Scottish equivalent of Passivhaus with the second section aimed at gauging views on financial implications of this new standard. The feedback from this consultation will feed into the next stage of this process, with a further consultation expected in Summer 2025.

In this paper, we first set out the summary of our comments for the overall objectives of the consultation and the proposals, before turning to the consultation questions. While we agree with the ambition to improve energy standards within the built environment, we raise significant concerns regarding **the current supply chain capacity, skills and rising costs of construction** which are likely to be a barrier to enforcing the new standard.

Another concern we highlight is the **carbon payback period** of Passivhaus buildings, which is estimated to be 25 years, in comparison to current buildings by Section 6 standards which is estimated to be 6 years. We recommend shifting the focus from operational carbon to whole life carbon cycle to ensure the standard accurately reflects the total environmental impact over the entire lifespan of a building to include emissions from materials, transportation, maintenance, refurbishment, and end-of-life disposal or reuse

There are also concerns over replicating this standard for non-domestic buildings. While we have seen examples of schools and universities being built by the Passivhaus standard, there are few instances of the standard being used in the commercial sector. Because of the varied nature of building types in the non-domestic sector, we believe there needs to be a flexible approach to setting standards as each building will have varying degrees of energy use patterns, construction methods, and financial considerations. We also highlight that the standards are too prescriptive which may undermine the potential to bring in innovative buildings techniques into the sector.

Ultimately, we urge the government to go with a phased approach to allow developers, the market and the supply chain to adapt to these changes and to avoid unintended consequences which may disrupt the pipeline of development.

## Section 2 - Identifying the components of an equivalent standard

### QUESTION 1

**Do you broadly agree with the statements on what 'equivalent' should not mean, in delivery of amended building standards to address energy and environmental performance?**

Yes

No

1. SPF acknowledges the ambition to improve energy efficiency in buildings through a Scottish equivalent of the Passivhaus standard. However, we have several concerns regarding the costs and practicality of implementing the standard which could act as a barrier towards development. The factors below must be carefully considered to ensure we do not compromise viability or stifle innovation in the sector.
2. Scotland should aim for an adaptive model, where stringent energy standards are applied but allow room for innovation, particularly in different climatic regions and varying building uses.
3. While Passivhaus principles are encouraged, alternative methods that consider local materials and regional construction techniques are acceptable. This ensures broad compliance without sacrificing design freedom.

#### Restricting Innovation

4. The non-domestic sector may face additional complexities in meeting the standard as replicating the methodology for the commercial sector will involve accommodating varying degrees of size, usage and additional requirements such as abnormal cooling or heating. The proposed standards should not be too prescriptive to allow scope for improvement, innovation and new technology to come into built environment in Scotland. We are conscious that Passivhaus standards may be too focused on the form & fabric of buildings that can lead to a very restrictive design process. In Norway for example, a country with similar climatic conditions, energy standards integrate flexibility for new builds. While Passivhaus principles are encouraged, alternative methods that consider local materials and regional construction techniques are acceptable. This ensures broad compliance without sacrificing design freedom.
5. Ultimately, we believe Scotland should aim for an adaptive model, where stringent energy standards are applied but allow room for innovation, particularly for varying building uses.

**QUESTION 2** Do you broadly agree with the statements on what 'equivalent' should require consideration of, in delivery of amended building standards to address energy and environmental performance?

- Yes
- No

1. SPF acknowledges the ambition to improve energy efficiency in buildings through a Scottish equivalent of the Passivhaus standard. Scotland should aim for an adaptive model, where stringent energy standards are applied but allow room for innovation, particularly in different climatic regions and varying building uses. In this consultation we have outlined several concerns regarding the costs and practicality of implementing the standard which could act as a barrier towards development. These factors must be carefully considered to ensure we do not compromise viability or stifle innovation in the sector.
2. We are also concerned that the non-domestic sector may face additional complexities in meeting the standard as replicating the methodology for the commercial sector will involve accommodating varying degrees of size, usage and additional requirements such as abnormal cooling or heating. The proposed standards should not be too prescriptive to allow scope for improvement, innovation and new technology to come into built environment in Scotland.
3. We are also conscious that Passivhaus standard may be too focused on the form & fabric of buildings that can lead to a very restrictive design process. In Norway for example, a country with similar climatic conditions, energy standards integrate flexibility for new builds. While Passivhaus principles are encouraged, alternative methods that consider local materials and regional construction techniques are acceptable. This ensures broad compliance without sacrificing design freedom.
4. Ultimately, we believe Scotland should aim for an adaptive model, where stringent energy standards are applied but allow room for innovation, particularly for varying building uses.

Section 3 - Proposed components of the standard – Design Topic - Standard 6.1 and approved calculation methodology

**QUESTION 3** On the basis that HEM and SBEM are reviewed and shown to report representative outcomes, do you support the continued use of calculation tools which implement the UK methodologies?

Yes

No

1. We agree that there should be a robust calculation methodology that must also look at the whole life carbon of a building. It is essential to ensure that energy performance is not just reflective of operational efficiency but also accounts for whole-life carbon and embodied energy across the building's lifecycle. However, there are concerns around the ability of the current UK methodologies (such as SBEM) to fully reflect the energy performance of ultra-low energy buildings, such as those built to the Passivhaus standard.
2. We welcome introduction of HEM and our members are encouraged by the fact it could potentially be more accurate, user friendly and adaptable than PHPP as it uses half hourly weather data (similar to IES).
3. Our members have reported specific challenges with PHPP as a calculation tool. It is not an intuitive system which uses an excel spreadsheet, limiting user input and requiring a lot of specific information in order to calculate energy performance which is often not available at the early stages, and is a very time intensive process. It has also been raised that the PHPP toolkit is not well set-up for apartments or non-domestic buildings as its tends to be used for detached and semi-detached properties. This further complicates the modelling process and limits the information that can be extracted from the model, particularly for apartment blocks where the whole apartment block envelope is modelled in PHPP meaning there is no understanding of how each individual apartment performs.
4. In contrast, UK methodologies such as SAP or SBEM can be more flexible but may underestimate actual energy savings in highly efficient buildings, particularly those using mechanical ventilation heat recovery (MVHR) systems and advanced insulation. We recommend a hybrid approach, where PHPP can be used alongside SBEM for non-domestic buildings. This would allow the strengths of both methodologies to be leveraged—PHPP for its detailed accuracy in low-energy design and SBEM for regulatory compliance. This method would also mitigate the high cost of compliance by reducing the need for separate certifications.
5. Moreover, the proposal for a 'Scottish wrapper' for the HEM is unclear, and we would need further clarification on how it would differ from existing UK methodologies. As the consultation evolves, we believe that any revised calculation methodology should be rigorously tested and validated against real-world performance data to ensure that the energy performance of buildings is represented as accurately as possible. Finally, the reformed EPCs that were consulted on in 2023 should be integrated into the overall methodology, so that

energy performance is representative of both delivered energy and operational carbon. This will ensure a comprehensive approach to energy efficiency in new builds across Scotland. The proposed reformed EPCs that were consulted on last year should also be taken into consideration so that the energy performance should be representative of the overall energy consumption.

#### QUESTION 4 Topic - Approach to defining overall building energy targets

**Do you support retention of the current approach and the setting of relative performance targets for new buildings through an approved calculation methodology?**

- Yes
- No

1. We acknowledge there are limitations using the relative approach to performance targets. One of the repeated concerns raised by our members is duration of the carbon payback period for Passivhaus builds. Our members have provided us with analysis that compared the operational carbon savings and increase in embodied carbon going from a 0.2 W/m<sup>2</sup>·K wall U-value to a Passivhaus 0.1 W/m<sup>2</sup>·K wall U-value. A Section 6 compliant wall U-value achieves a payback (approximately within 6 years) ahead of the 2035 grid decarbonisation forecast. However, to achieve a Passivhaus wall U-value of 0.1 W/m<sup>2</sup>·K, the amount of wall insulation doubles which doubles the amount of embodied carbon which is not off set by the savings in operational energy. This raises the question of whole life carbon output of the Passivhaus standards.
2. We feel current system provides greater flexibility that does not compromise innovation. We are concerned that absolute targets introduce rigidity and may not work for all building designs. To combat this issue, the approach could combine relative performance targets with a baseline threshold for thermal performance to ensure minimal energy use in all buildings. For example, Dundee's Waterfront regeneration project serves as an excellent example of how relative performance targets can enable flexibility while maintaining strong environmental goals. This £1.6 billion project spans 240 hectares and integrates various sustainable design elements, such as energy-efficient buildings, district heating networks, and BREEAM certification for sustainability standards.

#### QUESTION 5 **Do you agree with the proposal to retain delivered energy, covering only regulated energy use, as the main compliance metric for targets set under standard 6.1 (energy demand)**

- Yes
- No

1. We believe it is important to include both regulated and unregulated energy to address the full scope of energy consumption. Even unregulated energy can constitute a significant proportion of total energy use. Not accounting for unregulated energy does not align with practices and will undermine the impact on climate.
2. Although developers cannot account for occupant behaviour but we suggest that any metric measuring delivered energy should be accompanied by occupant education programmes that guide residents or building operators on managing systems efficiently.

**QUESTION 6** **Do you support further consideration of the introduction of a prescriptive space heating demand limit for new buildings through building regulations?**

- Yes
- No

1. We do not agree this is necessary but if consideration is given, then we would suggest phasing space heating demand limits to allow time for developers to upskill and adopt new technologies while preventing immediate disruption in the sector. It must also be considered that a heat demand limit will require higher insulation levels which results in increased embodied carbon. It is important that a balance can be struck so that whole life carbon is accounted for not just operational carbon.

**QUESTION 7** **Do you support the move to application of regional climate data within the approved calculation methodologies and their application within compliance targets?**

- Yes
- No

1. We support the incorporation of regional climate data to ensure decisions regarding the materials, insulation, heating and cooling systems can account for varying climates where buildings in urban areas tend to be subjected to different climate conditions than those in rural locations. For example, urban areas tend to be warmer and therefore, may meet the thermal requirements more easily than rural / island areas where these locations tend to be more exposed. We also advocate for consideration toward the geographic context

where transportation costs could be higher and access to materials harder in more rural locations. We encourage the government to ensure that any new regulations are adaptable to these variations to avoid unnecessary constraints in certain regions.

2. We propose collaboration between SEPA, climate scientists, and developers to ensure that climate data is region-specific and practical without being overly conservative in risk assessment, as overly cautious data might inflate costs and inhibit design flexibility.

## Topic – Building Fabric Standards

**QUESTION 8** **Do you currently deliver new buildings that exceed ‘backstop’ values for fabric performance set under standard 6.2 or those used to define the notional building in guidance to standard 6.1?**

Not comment

**QUESTION 9** **Do you have any particular views on limiting fabric infiltration through the building standards?**

Yes

No

We believe there should be an alternate measure suggested to limit fabric infiltration, with consideration to additional embodied carbon and emissions that will go in the building. There should be a flexibility and choice on limiting fabric beyond modelling operational energy usage and focusing on EUI (energy use intensity) alongside airtightness criteria, giving developers more flexibility in choosing materials and construction techniques without compromising energy goals.

## Topic - Ventilation and occupant comfort

**QUESTION 10** **Do you have any particular views on the means by which effective ventilation of new buildings is best achieved?**

Yes

No

1. Healthy ventilation must be ensured to avoid internal humidity and the risk of mould growth. In Passivhaus buildings, ventilation cannot rely solely on MVHR



systems, as they require regular maintenance. If not properly maintained or operated, issues such as overheating, heat loss, or mould growth can arise.

2. There should risk preparedness for the occupier, so we suggest mandatory training for occupants on how to operate and maintain MVHR systems, potentially adding this requirement as part of the handover documentation to ensure MVHR systems continue functioning effectively.

**QUESTION 11** **Specifically for new homes should further guidance be given on MVHR, generally, and through the Technical Handbooks?**

- Yes  
 No

1. Yes, as stated in the previous answer there can be issues with MVHR, it is also dependent on user behaviour so there should be proper guidance and training provided. Yes, as stated in the previous answer there can be issues with MVHR as it is dependent on user behaviour so there should be proper guidance and training provided.
2. Also, to highlight, MVHR is also expensive to install, run and maintain which will in turn add to the total building and operational costs. To make it available and viable for mass market, MVHR manufacturers and service providers can be incentivised to make it more viable for the market.

**QUESTION 12** **Are there areas of newbuild design and specification you would wish to highlight as potential risks to occupant comfort that should be better addressed through the building standards?**

- Yes  
 No

As mentioned in previous answers, as the standard is not yet adept for non-domestic buildings, we are particularly concerned with corridor heat recovery and the issue of overheating. There is a need to ensure adaptive comfort strategies such as natural ventilation options or external shading are integrated into the Passivhaus standard to prevent issues like overheating in larger, multi-occupancy buildings.

Topic - Alternative means of compliance

**QUESTION 13** **Do you consider that Passivhaus Certification offers a feasible alternative means of compliance with standard 6.1 (energy demand)?**

- Yes  
 No

We agree that a Passivhaus standard could be an alternative means of compliance but that it is not the only regulatory process for achieving desired energy demand (standard 6.1). We support a flexible approach where developers can opt for Passivhaus. In terms of compliance, we suggest a network of local certifiers to be established to reduce reliance on the Passivhaus Institute and to bring down certification costs. It would seem appropriate for the Scottish Building Standards Hub to serve as a national accreditation body for low-energy building standards in order to increase the number of verifiers.

### Topic - Summary of proposals

**QUESTION 14** **Are there any other comments or observations you wish to make on the proposed components of the review which relate to building design?**

- Yes  
 No

One observation is the additional cost and resourcing for the certification. Compliance can currently only be obtained from the Passivhaus Institute and if we have various individual certifiers, the cost of compliance may go up. The upskilling of staff in local authorities and within the industry will also add to the cost and time. To mitigate these issues, there could be a consideration on a feasible cap on the cost. or the government should offer grants or subsidies to cover additional certification costs. Provision of such schemes could ease the transition to more stringent standards without deterring smaller developments.

### Section 4 - Proposed components of the standard – Compliance Topic - Principles of an evidence-led approach to compliance

**QUESTION 15** **Do you currently apply an in-house or third party compliance management process to your projects which specifically addresses energy and environmental project elements?**

No comment

**QUESTION 16** **From your experience of delivering very low energy buildings, what are the most common risks identified at an early design stage and how are they managed most effectively?**

No comment

**QUESTION 17** Do you consider there are practical limits to effective risk management at design stage alone and can you give examples of where management of risk is more effective at a later (construction) stage?

No comment

**QUESTION 18** Do you currently apply a particular approach to the recording of project information during construction that can demonstrate, to a third party, that work complies with energy-related aspects of building regulations?

No comment

**QUESTION 19** Do you currently compile and report summary information on the completed building as part of a handover record of project information that goes beyond what is currently required by building regulations?

No comment

**QUESTION 20** Do you have experience of implementing methods to effectively de-risk the very low energy building aspects of design and construction and provide assurance that the compliant solutions are properly considered and delivered as intended?

No comment

Topic - Intent to develop guidance/application in practice

**QUESTION 21** Do you consider the proposals set out present a reasonable summary of why there is a need for improvement in compliance processes to deliver very low energy buildings

The proposals accurately outline the challenges in the current compliance process and highlight the need for improvements to effectively deliver very low energy buildings. We recognise the need for improvement in compliance processes and a guide would clarify application in practice. However, as referenced in our previous responses, we urge that the guide is flexible and not overall prescriptive, where there is scope for developers to use different approaches to achieve similar efficiency standards. Developers may also find it helpful for the guide to clearly outline the actions required at each stage, particularly at the pre-building warrant stage.

However, we believe that some additional points could strengthen the rationale for why compliance improvements are essential:

1. *Consistency Across Projects* - One major challenge is the inconsistent application of standards across projects, both in terms of design and construction. While the proposals touch on this, we suggest that the compliance process should introduce clear and enforceable checkpoints at every stage of construction. For example, the Queens Quay project in Clydebank benefited from staged compliance checks, ensuring that each phase met energy performance requirements. Applying this structured approach across Scotland would ensure that buildings maintain energy performance throughout the project lifecycle.
2. *Lack of Early Engagement with Regulators* - Early engagement with regulatory bodies is often missing from many low-energy building projects, which can lead to delays or failure to meet standards later in the construction process. This is well-documented in the consultation, but the proposals could further emphasise the importance of a pre-warrant verification stage to identify potential issues early. This would prevent costly adjustments later in the build and promote smoother compliance, as seen in projects like the Dundee Waterfront, where early regulatory engagement facilitated compliance.
3. *Skills and Knowledge Gaps* - The proposals address the issue of skills shortages in delivering very low energy buildings. We agree with this point and recommend that the compliance process improvements include provisions for upskilling the workforce and training certification bodies on the latest techniques for energy-efficient construction, including airtightness, mechanical ventilation systems, and insulation detailing.
4. *Monitoring and Post-Occupancy Evaluation* - The proposals highlight the importance of post-construction performance monitoring, but more emphasis should be placed on post-occupancy evaluation. Many very low energy buildings experience performance gaps between design and actual energy use due to occupant behaviour or building operation issues. Incorporating requirements for post-occupancy assessments into the compliance process would help verify whether the buildings are meeting their intended energy performance goals.

**QUESTION 22** Do you consider the proposed scope of application and recommended actions are appropriate to address the effective delivery of very low energy buildings?

No comment

**QUESTION 23** Do you support the application of provisions from an early (pre-warrant) design stage through to completion and handover of the building?

- Yes
- No

**QUESTION 24** Do you have any views on the key areas where the verification process should focus, to be effective in responding to an enhanced compliance reporting regime?

Yes

No

Should Passivhaus become a mandatory standard, our members have raised concerns over the specialised training and additional capacity required of verifiers particularly if local authority funded. With compliance more stringent, the demand on verifiers time and expertise is likely to increase and with that so are costs. We are concerned that the enforcement dates of 2026 or 2028 is simply too soon to have built up the knowledge and expertise required to accurately verify buildings which could result in inconsistencies in meeting the standard. We support the role of the new Scottish Building Standards hub to guide the industry but again emphasise this needs to be properly resourced.

**QUESTION 25** **Do the recommendations presented adequately describe action to affect the key roles and responsibilities of those who contribute to building compliance?**

Yes

No

In general, this is a good basis for the guide. We suggest that the guide should outline the different roles of each actor at different stages of the development, so it is clear who is responsible for what and when. In addition, it may be helpful to have a compliance plan manager to oversee the project and coordinate the various actors involved in contributing to building compliance although we appreciate this could incur additional costs.

Section 5 - Call for information on current standards  
Topic - February 2023 design specifications

**QUESTION 26** **Are you currently designing buildings to the February 2023 standards and have confirmed specifications which are at a stage that have been or will be used in a building warrant application, that you would be happy to share with us?**

No comment

**QUESTION 27** **With regards to the current approach to target setting and overheating risk, do you have experience related to either of these two issues you consider useful to inform review of the current published guidance or this review of current energy and environmental standards?**

No comment

Topic – New build heat network connections

**QUESTION 28** Have you undertaken any projects under the post-2023 energy standards which considered connection to a new or existing heat network, both district heat networks and communal heating systems?

No comment

**QUESTION 29** Do you have experience of issues affecting development which you consider have arisen from application of current energy and environmental standards set under building regulations?

No comment

### Section 6 - Proposed delivery programme

**QUESTION 30** Do you agree with the proposal to mandate the standard in 2028, introducing changes initially as a voluntary standard from 2026?

- Yes  
 No  
 Not sure

1. Whilst we support a voluntary standard from 2026, we are extremely concerned with the mandatory enforcement date of 2028 particularly for those unfamiliar with Passivhaus. Our members have repeatedly raised concerns regarding the industry's readiness, particularly over a lack of skills, increased costs and supply chain capacity issues. These challenges may significantly increase the viability risks for the development sector, especially for large-scale projects and more complex building types.
2. *Skills and Labour Shortages* - There is a widespread skills gap in the delivery of Passivhaus-standard buildings, particularly in areas such as airtight construction, mechanical ventilation heat recovery (MVHR) systems, and low-carbon construction techniques. A national upskilling programme will be necessary, targeting contractors, verifiers, and architects alike. Without this, the industry will struggle to deliver the standard at scale by 2028. We recommend that the government collaborate with industry bodies to develop and fund a dedicated training scheme during the voluntary period (2026–2028), ensuring the workforce is adequately prepared.
3. *Increased Costs and Market Concerns* - The cost of delivering buildings to the Passivhaus standard is significantly higher than building to current regulations,

which presents a serious concern amidst the ongoing housing crisis and broader development goals. For instance, Willie Rennie MSP noted in the recent Scottish Parliament debate on 2 October that, in East Dunbartonshire, the cost of constructing Passivhaus-standard homes has reached nearly £500,000 per unit. This stark cost increase threatens the financial viability of many developments, particularly in the private sector. **In response, we urge the government to consider financial subsidies, tax relief, or grant schemes to offset the initial capital costs associated with delivering these high-performance buildings. Without financial assistance, many projects could become unviable, exacerbating Scotland's housing shortage.**

4. *Commercial Development Feasibility* - While educational buildings, such as schools and universities, have successfully implemented Passivhaus standards, these examples do not necessarily reflect the broader commercial sector. Educational buildings typically have different operational profiles, longer life cycles, and unique funding structures. In contrast, commercial developments operate under market-driven financial models, where construction costs and tenant demand play a critical role in a project's success. The increased costs required to meet Passivhaus standards may drive higher rents and business rates, reducing the attractiveness of these buildings to prospective tenants. There is currently insufficient evidence on how a broad range of commercial buildings can meet the 2028 mandatory standards without severely affecting market dynamics. **To address this, we recommend that the government fund and monitor pilot projects in different sectors (e.g., offices, retail, industrial) during the voluntary period. This would allow for the refinement of standards and practices specific to the commercial sector, ensuring that the new regulations are both feasible and scalable across different types of developments.**
5. *Balancing Operational Savings with Capital Costs* - Although operational energy savings are often cited as a long-term benefit of Passivhaus buildings, these savings are not always realised by developers or tenants. The higher capital costs required to meet these standards often lead to higher rents, negating the benefits of lower operational energy costs. In many cases, tenants may face higher occupancy costs (through increased rent and rates), which reduces the perceived financial savings. This creates uncertainty for developers regarding tenant demand.
6. A key recommendation would be for the government to explore incentives that align the interests of both developers and tenants, such as lower rates for Passivhaus-compliant buildings, green bonds, or tax incentives for tenants who occupy highly energy-efficient buildings. These mechanisms would ensure that both developers and tenants benefit from the transition to very low-energy buildings, while mitigating concerns around affordability.

7. We suggest that a more gradual, phased approach be adopted to allow developers time to incorporate these standards without causing undue disruption to ongoing projects. The market, supply chains, and labour availability must all be factored into the timeline to ensure the smooth transition of compliance.

End of questions