Passivhaus Trust - Written evidence to the Local Government, Housing and Planning Committee in relation to the draft Climate Change Plan
9 December 2025

1. Factual correction

The UK Passivhaus Trust would like to correct a comment made David Raine, Policy Manager, Homes for Scotland, in his submission to the Net Zero, Energy and Transport Committee Call for Views on the Draft Climate Change Plan Scrutiny 2025[1]:

In response to Q1 (What are the most important policies needed to achieve the proposed carbon budgets level for 2026-40 in the buildings sector?), Homes for Scotland's submission states that:

> "a 2-bed mid-terrace home built to Passivhaus Standard would have an additional annual running cost of more than £1000 compared to a home built under the 2024 New Build Heat Standard, and an estimated £24,000 capital cost increase compared to a home built to 2015 regulations. These costs will inevitably increase mortgage costs as greater borrowing will be required. For a 4-bed detached home, the annual running costs are around £1,500 higher compared to a 2024 New Build Heat Standard home and the capital cost is estimated to be £36,750 higher than a home built to 2015 regulations."

The Passivhaus Trust believes the cost figures cited to be factually incorrect and points to research articles that illustrate this.

1.1. Passivhaus running costs

Research and modelling undertaken by Dr Rachel Mitchell on behalf of the Passivhaus Trust and published in 2023 shows energy costs of a Passivhaus end terraced house to be 46% cheaper than an end terraced house built to Section 6 2023 of Scottish Building Regulations and aligned to the requirements of the New Build Heat Standard (with an ASHP).

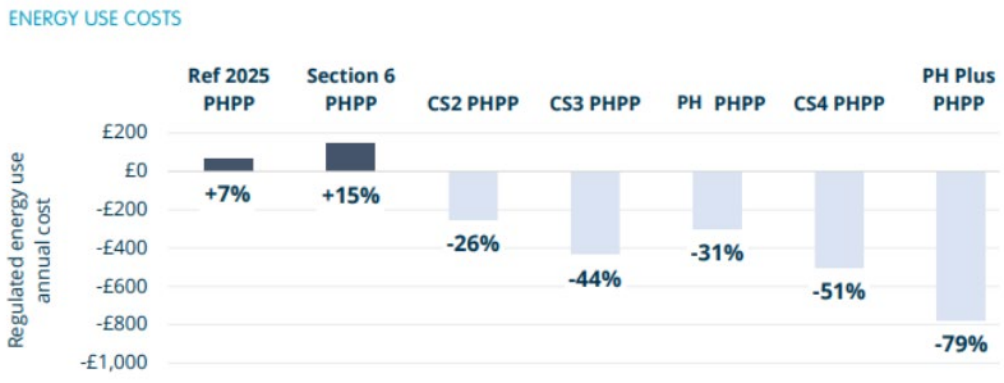

Figure 4: Predicted regulated energy costs reduction compared to Ref 2021

Source: Future Homes Hub contender specifications for the FHS, June 2023: https://passivhaus.uk/wp-content/uploads/2024/10/FHH-contender-specifications-PHT-position-paper-v1.1-230620.pdf

[1] Homes for Scotland response available from - https://yourviews.parliament.scot/nzet/draft-climate-change-plan-2025-call-for-views/consultation/view_respondent?uuId=915815046

These findings are consistent with modelling undertaken by Dr Rachel Mitchell on behalf of the Passivhaus Trust and published in 2025 which compares the Passivhaus Standard with the proposed Future Homes Standard (FHS), which finds Passivhaus energy costs cheaper than current building regulations and all FHS proposals (with heat pumps and solar PV)[2]. See Appendix A.

1.2. Capital costs

As an overall comment, it is unclear why the HFS suggested build costs are compared to a 2015 regulation home, while running costs are compared to a home built under the 2024 New Build Heat Standard.

When compared to 2013 building standards, our research shows a 2-bed terraced home built to the Passivhaus standard has an average cost uplift of 4%:

	Cost uplift against Part L1A 2013
PHT best practice	9%
PHT experienced practitioner	8%
PHT projection of costs when delivered at scale	4%
Currie and Brown 2019	4%
Building for 2050 fabric only	1 – 2.5%
AVERAGE	4% uplift

Table 2: Summary of uplift to CS4 type fabric standards

Source: Future Homes Hub contender specifications for the FHS, June 2023 https://passivhaus.uk/wp-content/uploads/2024/10/FHH-contender-specifications-PHT-position-paper-v1.1-230620.pdf

Research comparing the capital costs of building to the Passivhaus Classic standard with the proposed Future Homes Standard 2025 (with solar PV), the build costs were found to be comparable:

The table below gives an estimate of the difference in capital costs between FHS PV and Passivhaus Classic for an end terrace dwelling, against a baseline of FHS no PV.

	FHS PV	Passivhaus
Renewable energy: 2.68 kWp of PV	£4,000 - £4,700	-
Building fabric and MEP	-	£4,500 - £5,600

Table 2: Comparison of capital cost differences between FHS 2025 PV and Passivhaus Classic[4]

Source: Passivhaus Compared to the Proposed FHS, March 2025 https://passivhaus.uk/passivhaus-compared-to-the-proposed-fhs/

[2] Passivhaus Compared to the Proposed FHS – March 2025 - https://passivhaus.uk/passivhaus-compared-to-the-proposed-fhs/

1.3. Further cost research

Without detailed analysis of the HFS modelling that resulted in the costs research presented, it is hard to be confident that we are comparing 'like with like' in the correction, but our research strongly indicates factual inaccuracies within the cost data submitted by HFS. The Passivhaus Trust would welcome the opportunity to work openly and transparently with Homes for Scotland and the Scottish Government to undertake modelling on the energy bill costs and build costs for all proposed changes to building standards. Please email info@passivhaustrust.org.uk to take this forward.

2. Why Scottish new build standards need to improve further

The Passivhaus Trust would also like to put forward the case for further improvements to new build standards, and for the Scottish Passivhaus Equivalent, to address points made by David Raine in his submission on behalf of Homes for Scotland to the NZET Committee's Call for Views on the Draft Climate Change Plan Scrutiny 2025[3].

2.1. Benefits of fabric efficiency improvements

Even with the New Build Heat Standard (NBHS) requirements in place, the Passivhaus Trust would argue that improving the fabric energy performance of new build homes should still be a key priority for the Scottish Government:

Improved quality assurance would effectively eliminate the 'performance gap'. Research indicates that new UK homes built to current building standard and designed in SAP can perform up to 60% worse than as than designed. Passivhaus homes have been shown to deliver significant energy and carbon savings over current building standards[4]. See Appendix B

Reducing heating demand at a time when PV generation is low (winter) reduces the peak load on the grid. As well as reducing loads, a well-insulated building like a Passivhaus makes things easier for the grid because it can "load shift". In a Passivhaus you can move the timing of heating energy use away from peak demand times, with minimal or no loss of comfort: https://passivhaus.uk/wp-content/uploads/2024/10/PHT_PH-Benefits-Summary_Full-report_5.0_Double-Page.pdf

Passivhaus levels of performance offers energy saving, health and comfort benefits, as has been recently recognised by Homes England's Healthy Homes guidance[5]. The health benefits of Passivhaus have just been publicly acknowledged in the Introduction to Homes England's Healthy Homes guidance:

> "Passivhaus is a well-established design and quality assurance system aimed at reducing energy demand, addressing the 'performance gap' of new buildings

[3] Homes for Scotland response available from - https://yourviews.parliament.scot/nzet/draft-climate-change-plan-2025-call-for-views/consultation/view_respondent?uuId=915815046

[4] UK Passivhaus and the energy performance gap, Energy and Buildings, Volume 224, 1 October 2020 - https://www.sciencedirect.com/science/article/abs/pii/S0378778820313918

[5] Healthy Homes — a foundation for healthier and resilient communities, Homes England - https://www.gov.uk/government/publications/healthy-homes

and improving comfort levels for residents. There is significant overlap between a Passivhaus approach and the aims of Healthy Homes."

While full Passivhaus certification is not a requirement, there are significant similarities between the Healthy Homes 'good practice enhancements' and the Passivhaus standard. Homes England now recognises the health advantages of Passivhaus, and Passivhaus dwellings will automatically achieve 'good practice' enhanced status on specific healthy homes measures[6]. These are cited as:

1. Building fabric and energy performance: The space heating must be a maximum of 15 kilowatt-hour per square metre per year, or peak heating load must be a maximum of 10 watts per square metre in accordance with the Passivhaus standard.

2. Overheating: Homes should be designed so that indoor temperatures do not exceed 25°C for more than 10% of the year, in accordance with the Passivhaus standard.

3. Ventilation and indoor air quality: The preferred ventilation strategy for Healthy Homes is a high-efficiency (greater than 75% efficient) mechanically ventilated heat recovery (MVHR) system, designed in accordance with the Passivhaus standard.

2.2. Scottish Passivhaus Equivalent

The comments about the Scottish Passivhaus Equivalent (PHEq), made in Homes for Scotland's response, do not reflect the position of the Cross-Industry Working Group consensus position[7], of which Homes for Scotland has played an active part.

The proposals for the Scottish Passivhaus Equivalent (PHEq), while representing a step-change in policy, are not about mandating full Passivhaus Certification for all homes. It is about embedding the core principles and metrics that reliably deliver energy efficiency, health, comfort, and performance-in-use. Over two years, the Passivhaus Trust has worked closely with Homes for Scotland to arrive at the working group consensus position, which would deliver this for Scotland.

The purpose of introducing a PHEq is to:

1. Set meaningful, measurable metrics that drive good design and construction quality.

2. Close the performance gap, which remains one of the most persistent problems in the UK new-build sector.

3. Use robust tools that predict performance accurately, and evaluate designs in a way that aligns with real-world outcomes.

---

[6] Healthy Homes — a foundation for healthier and resilient communities, Homes England - https://www.gov.uk/government/publications/healthy-homes

[7] Energy standards review - Scottish Passivhaus Equivalent Working Group consensus report: November 2024 - https://www.gov.scot/publications/energy-standards-review-scottish-passivhaus-equivalent-working-group-consensus-report-november-2024/

4. Embed principles of health and comfort, such as adequate ventilation, stable indoor temperatures, good indoor air quality, and protection from summertime overheating.

Such an approach is entirely consistent with delivering high-quality new homes at scale. Several major housebuilders - including Cairn (in Ireland) and Barratt London (in the UK) - are already demonstrating that full Passivhaus certification is viable and provides their occupants with significantly improved comfort, health, and reliable low energy bills.

Adopting a Scottish Passivhaus Equivalent would demonstrate real-world industry leadership, demonstrating that using Passivhaus principles is not only technically achievable, but aligns with consumer demand for homes that genuinely perform and support wellbeing.

APPENDIX A

Research and modelling undertaken on by Dr Rachel Mitchell on behalf of the Passivhaus Trust and published in 2025 shows energy costs of a Passivhaus terraced house and apartment to be cheaper than:

- A comparable house built to Part L 2021
- A comparable house built to proposed UK Future Homes Standard with heat pump and solar PV panels
- A comparable house built to proposed UK Future Homes Standard with heat pump only

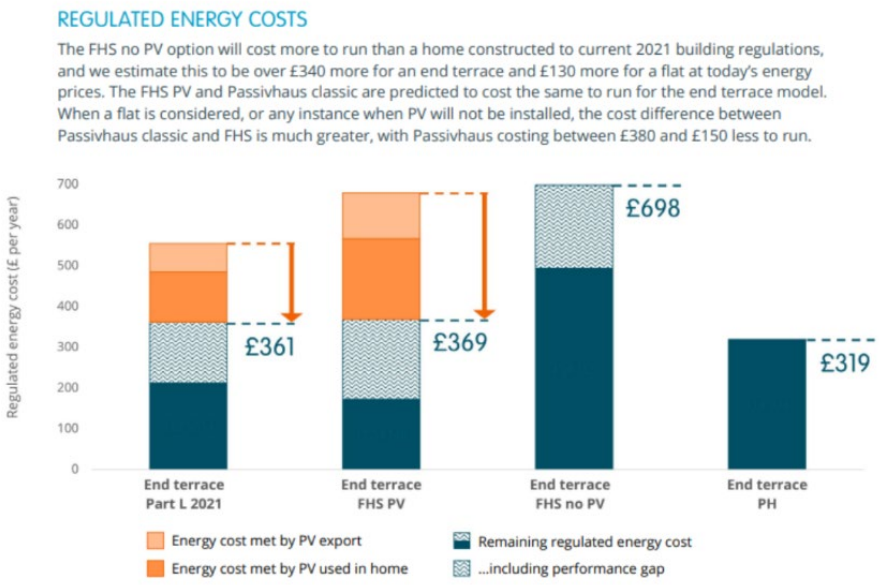

Figure 5: Predicted regulated energy costs for end terrace house

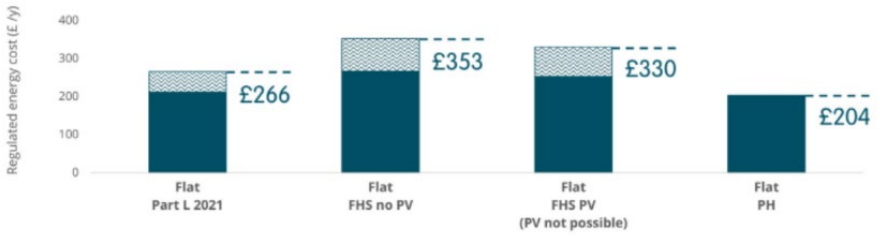

Figure 6: Predicted regulated energy costs for flat

Source: Passivhaus Compared to the Proposed FHS – March 2025
https://passivhaus.uk/passivhaus-compared-to-the-proposed-fhs/

APPENDIX B

UK Passivhaus and the energy performance gap

An independent academic study, published in Energy & Buildings in 2020 reported "clear evidence of an energy performance gap in new dwellings, which is a risk to homeowners, developers, and government (ZCH, 2014). Field testing has shown that fabric heat losses can be between 50% and 60% more than design predictions and space heating demand typically 100%–150% greater in new build homes. The main identified reasons for this energy performance gap are the quality of the design and building modelling, construction and commissioning, occupancy patterns, user behaviour, and robustness of post occupancy testing." At the same time there is
"clear evidence that compliance with the Passivhaus standard delivers low-energy homes, with no performance gap, which are affordable to heat and without the need for complex metrics. "

Source: https://www.sciencedirect.com/science/article/abs/pii/S0378778820313918

Submitted on behalf of the Passivhaus Trust
www.passivhaustrust.org.uk