

# Passivhaus Scottish Equivalent Standard

WG 02a Workshop – Space Heating Demand  
Workshop 1 Notes



Built  
Environment  
—  
Smarter  
Transformation

28 September 2023

<b>Breakout 1</b>	
2.2	<p><b>With reference to how the 2023 standards are dictating the design of buildings (refer to WG 13 (23)), in terms of fabric and services performance, what is currently being delivered?</b></p> <p>Current air tightness standard of approx 4, expect this to improve when first test is carried out on new standards - although causing concern with regards to ventilation strategy and how to implement this into standard house designs.</p> <p>Currently having new Psi values modelled based on our new standard design.</p> <p>PHPP is a bespoke tool for specific plot orientation, location, weather etc this cannot be used by developers with standard housing portfolios servicing all Scottish locations.</p> <p>There is no supply chain for triple glazed windows in UK/Scotland.</p> <p>Most developers have Psi values assessed for common detail, that currently work - NHBC etc need to watch we don't bring in details that are not feasible at scale.</p> <p>First new development to 2023 standards. Currently our floor and ceiling u-values are lower than PHPP backstop.</p> <p>Info being gathered from social sector but difficult to collect at the moment. Historically have performed better than minimum standards in Building Regs.</p>
2.3	<p><b>With reference to how the 2023 standards are dictating the design of buildings (refer to WG 13 (23)), in terms of space heating demand in kWh/m<sup>2</sup>/yr, what is currently being delivered?</b></p> <p>Scotland - our proposed current fabric is 140mm timber kit with 140mm 0.032 insulation, 25mm rigid insulation overlay, service void. 400mm LR44 and 0.14 for floors</p> <p>Current projects are being delivered to Passivhaus so not focussed on current standards other than for compliance purposes.</p> <p>Passivhaus Classic heat demand has been deliverable.</p> <p>NI EPC air tightness has been 3.5m<sup>3</sup>/h/m<sup>2</sup> or less on majority of tested dwellings for some years now- possibly getting lower in new construction.</p> <p>2023 standards we are looking at space heating demand of around 30 kWh/m<sup>2</sup>/Yr.</p> <p>Air Tightness 5 (avoiding MVHR) U values - Wall 0.15, Roof &amp; Floor 0.12</p>
2.4	<p><b>Referring to 2.2. and 2.3 above, where could reasonable and scalable progress be made over the period 2025/26?</b></p> <p>Current projects are being delivered to Passivhaus so not focussed on current standards other than for compliance purposes.</p> <p>Water heating becomes critical, need to develop thoughts around energy demand for this.</p> <p>Achieving around 20 -25 kWhrs for housing of differing styles would seem feasible, much beyond this is losing benefit and costing too much.</p>

	<p>Good fabric to 0.19u and air tightness of 3-4.</p> <p>25kw/hrs is doable.</p> <p>Achieving around 20 -25 kWhrs for housing of differing styles would seem feasible, much beyond this is losing benefit and costing too much.</p> <p>NI fabric- typically 150mm cavity full fill walls, double glazing, 300mm loft insulation, 0.16-0.14 floors- anecdotally hearing that triple glazing should be viable.</p> <p>Air Tightness 1 U Values – Roof 0.09, Floor 0.07, Walls 0.11</p> <p>Air Tightness 4</p> <p>Air Tightness 3-5</p>
	<p>General comments:</p> <p>Notional building as used in SAP is logical, because developers use standard house types. Sap needs to be configured to adopt some good stuff from PHPP</p> <p>SAP is well used in sector, moving away from this will be disastrous.</p> <p>Current performance measured via SAP so difficult with data comparisons.</p> <p>Most developers argue they pursue a fabric led approach to compliance, which seems reasonable from EPC Fabric data.</p> <p>MVHR seen as challenging in NI due to lack of suppliers/skills and failures /maintenance issues in social housing sector.</p> <p>Anecdotally 2023 standards doing what they intended to do in providing a step change improvement.</p> <p>Different house types limit solutions. Could have standard spec for fabric but then use other solutions like PV to get over the line.</p> <p>There are issues with social housing ventilation strategy.</p> <p>Adopting PHPP would be a big benefit and make things a lot easier in the move to Passivhaus Scottish Equivalent.</p>

Breakout 2	
2.1	<p><b>What is the most appropriate way of defining an energy performance target in the current building standards system whilst being cognisant of how Passivhaus and other standards address this?</b></p> <p>Notional dwelling approach seems essential to ensuring delivery of housing at scale through standardised house types.</p> <p>kWh/m2 is the only metric that stands up to scrutiny when analysing using real (not modelled) energy consumption data. But that doesn't mean we shouldn't use other metrics (in EPCs etc).</p> <p>Would England's approach (FEES) be beneficial in ensuring reasonable prioritisation of Space heating demand, whilst enabling a Notional Dwelling approach?</p> <p>Is the standard 15kWh/m2.y target appropriate for all building types? how does it cope with different occupancy - eg a school occupied 9-3.30 for 65% of the year vs a 24/7 hospital? Improved fabric should have a better return on investment in the hospital than the school.</p> <p>Energy demand/m2- could "per m2" metrics be encouraging oversized dwellings with a higher total energy demand?</p> <p>2023 example - all achieved B (26 to 33-34 kwh/m2/yr). Detached performing more poorly (particular smaller).</p> <p>Does location play a part? We need better modelling.</p> <p>Heat demand, one target should be set!</p> <p>Flexibility, design &amp; scalability.</p> <p>Designing for local conditions for large scale housing not efficient.</p>
<p>General comments:</p> <p>Consumers will be more interested in their bills rather than generic kWh requirements. from this point of view, there is little benefit in reducing space heating demand if you are requiring the use of a more expensive fuel. Should the space heating, or total energy demand take fuel prices into account?</p> <p>Abandoning the Notional Dwelling approach would seem likely to make housing more expensive to construct in colder locations- impacts on remote communities, which might already be struggling to afford current standards. Conversely the absolute target would help standardise energy demand (and running costs) across locations.</p> <p>Space heating limit allows for a model that reflects location specific outcomes, but this conflicts with developer calls for standardised construction. How is this resolved in other regions which claim to have introduced PH standards in their building regs?</p> <p>To target a high quality manufacturing process we need to target standardised fabrics and not varied fabrics to suit a backstop heating demand.</p> <p>Notional backstops allow more flexibility for modular manufacturers in achieving overall performance but maintaining standard designs and factory efficiency.</p>	

<b>Breakout 3</b>	
2.5	<p><b>What are the key aspects of the Passivhaus process and other low energy standards that result in achieving a low heating demand at design stage?</b></p> <p>Higher emphasis on thermal bridging in PH and no defaults (defaults now removed in SAP 10 also however).</p> <p>PH certification, builders, designers and certifiers contribute to the performance.</p> <p>Can satisfy with modelling at design stage but then still difficulties in compliance on performance</p>
2.6	<p><b>What are the key aspects of the Passivhaus process and other low energy standards that result in the design heating demand target being achieved in use?</b></p> <p>Widespread and improved post occupancy research feeding back into the modelling assumptions is essential.</p> <p>Building regs inspection improvements / investment in enforcement.</p> <p>Expanding role of existing section 6 certifiers.</p> <p>Potential options:</p> <ol style="list-style-type: none"> <li>1. Building control to take more hands on approach</li> <li>2. Photo evidence</li> <li>3. Building Performance Evaluation (thermal performance, air tightness)</li> </ol> <p>PHPP has been tested and modified over years for accuracy.</p> <p>Air Testing more than once.</p> <p>Certification of design scheme exists and could be applied.</p>
2.9	<p><b>Understanding what a more robust design and construction assurance framework looks like, how this could complement and/or supersede current work in this area and where the current certification schemes fit into this?</b></p> <p>Passivhaus does help to control quality - have to build what was designed.</p> <p>Approach in England /Wales with photographic evidence - benefits to quality but not performance</p>
2	<p><b>Are there any specific skills gaps across industry related to successfully achieving lower design and as-constructed heating demands?</b></p> <p>Massive shortage of suitably qualified / accredited assessors - a C&amp;G in Energy Awareness should not be a qualification even for just conducting an rdSAP assessment.</p> <p>Skill level and responsibility of compliance checkers needs to be considered.</p> <p>Concern on capacity of certifiers if rolled out at a wider scale.</p> <p>Skills shortages and quality variation across industry - not only site managers, CoW but also trades.</p>
2.7	<p><b>With cognisance of the timescales associated with the development and delivery of updated versions of the UK wide compliance methodologies and their intended functions, what role do robust design and compliance tools have to play in supporting the delivery of all new buildings to a Passivhaus equivalent standard?</b></p>

	Sampling of buildings and SAP results is tiny (and involves putting the same data in the same spreadsheet) - far too easy to cheat the system. Again, a workforce issue.
2.8	<b>Identifying any unintended consequences related to this review and providing robust evidence on how these consequences present themselves with consideration of how these could be effectively mitigated/managed.</b>
	Lack of educated building users will be a problem
<p>General comments:</p> <p>Specific gaps in mechanical ventilation certification (acoustics part of this too)- RoI has introduced 3rd party validation requirements of design and commissioning (although RoI has many fewer building control inspectors)</p> <p>Building Warrant fee increase - to improve on site visits and compliance.</p> <p>Culture change required to call attention to objective work.</p> <p>Upskilling will support the changes in the building regulations, from the client through to the installer.</p>	