Proposed Domestic Building Environmental Standards (Scotland) Bill

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.

Consultation by

Alex Rowley MSP for Mid Scotland and Fife Region

4 May 2022

Contents

Foreword

Fuel poverty is a blight that has long plagued Scotland, heating costs continue to rise, and we are now in the midst of a climate crisis that demands that action must be taken to mitigate the worst effects of catastrophic climate change.

In the Scottish Parliament, global and domestic public and political pressure made political parties come together to discuss the climate crisis. On 24 June 2009 MSPs voted unanimously to support the Climate Change Bill, setting ***'world leading'*** climate change targets. This set a goal of reducing Scotland's emissions by 42% in comparison with 1990 levels and stated this had to be met by 2020.

In May 2019 the Scottish Parliament updated its position declaring a climate emergency and the Climate Change Bill set a new and legally binding target of net-zero greenhouse gas emissions by 2045.

This was a significant achievement and is evidence of how far climate change has risen up the political agenda and how seriously it is viewed across society.

The Greenhouse Gas or the GHG account reduced by 51.5 per cent between the baseline period (1990 for CO2, methane, nitrous oxide and 1995 for hydrofluorocarbons, perfluorocarbons, sulphur hexafluoride and nitrogen trifluoride) and 2019. This is a significant achievement.

However, the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019, which amended the Climate Change (Scotland) Act 2009, specified reductions should have seen **a 55.0 % reduction over the same period.**

In relation to residential housing, the report identified the sector as being dominated by heating from direct fuel combustion in households. Between 1990 and 2019 there

was a reduction of 22.3 % in emissions. This decrease is related to a switch from less efficient solid and liquid fuels to natural gas for heating, and improvements in household energy efficiency but there is clearly some way to go.

Therefore, despite progress **the target for 2019 has not been met.**

The Scottish Government's Climate Change plan monitoring report was published in 2021. In Chapter 2 relating to buildings it said:

'The 2018 annual emissions envelope published in the 2018 Climate Change Plan3 for this sector was for 9.0 MtCO2e, whereas the outturn emission statistics for this year (published in June 2020) show a position of 9.4 MtCO2e. On the basis of comparing these figures, the sector was outside its envelope in 2018*'.*

So again **- the target has not been met.**

Delegates at the COP26 conference in Glasgow at the end of 2021 agreed that urgent action was needed across a wide range of sectors if we are to avoid an imminent climate catastrophe.

At the same time huge and unprecedented increases in the wholesale gas price has seen many gas suppliers going bust and plunged hundreds of thousands of families into fuel poverty as the price of domestic gas has risen. Energy sector analysts are warning that the energy price cap first set by the UK regulator at £1137 for the average dual fuel home in 2019 could reach £2000 by the end of 2022.[1]

Whilst there has been significant progress in energy generation from renewable sources there are still major gains to be made in reducing emissions and improving energy efficiency as it is far more cost effective and efficient to save energy. The Passivhaus approach set out in the section below takes an 'energy first' approach as the cheapest, and most sustainable, energy is the energy you do not use in the first place.

A lot of the work to tackle the climate crisis requires global, collaborative action, but right now here in Scotland, we can undertake action that will help. By introducing new minimum environmental standards for all new-build housing built in Scotland we can reduce emissions from housing built here and tackle one of the issues, contributing to our CO2 emissions, head-on now.

There is a lot of talk about zero emissions, decarbonisation and green energy. We cannot just rely on decarbonising the grid to meet our commitments. We must significantly improve the energy performance of our buildings. This is because the

[1] https://www.ft.com/content/55fcab59-ef29-4175-8532-a3ec7c7b5f95

national grid has limits. Whilst the energy offered by wind, solar and the tide is almost infinite, our capacity to harvest that energy is not - there is a financial and carbon cost to all renewable technology.

And all the renewable energy and storage capacity has to be shared with all sectors (particularly transport). Also, electricity is currently around four times more expensive than gas, so we risk pushing more people into fuel poverty, unless heat pump installation and other innovations are coupled with significant improvements in the energy performance of our buildings.

"More than one in three people in Scotland find energy bills unaffordable, according to new polling for Citizens Advice Scotland (CAS) by YouGov. The research found 36% of people couldn't afford their fuel bills. Of these, 80% cited rising energy costs as a reason, with 65% saying the rising cost of living was a problem. Meanwhile, 40% said low incomes was an underlying problem, with 24% stating their home being hard to heat was a factor." [2]

The cost of building more efficiently is 3-4pence per kWh, over a 60yr life cycle. The cost of generating that kWh rather than saving it is more expensive, in every scenario, for all forms of renewable energy.

In introducing this consultation, I note that while announcements in the 2021/22 Programme for Government state zero-emission heating will be a requirement for new build housing from 2024 and energy standards within current building regulations will be reviewed to deliver further improvement - these actions fall far short of what is required for Scotland to meet its Net Zero commitments in the house building sector.

Energy efficiency improvements through new building standards is the only realistic way to achieve net Zero Carbon without massive renewable energy expansion coupled with a significant, and expensive, investment in grid capacity.

It is on this basis that I am determined to change the law through the members bill process to mandate a Passivhaus standard or a Scottish equivalent for all new build housing building in Scotland. This would include the energy efficiency and thermal performance standards required of any Passivhaus building. This would apply to the construction of all new-build homes, for example it would cover all new houses and all new flats. My proposal also includes a verification process to ensure design specifications agreed in the planning permission process are verified as delivered when the building is completed. This is to ensure no 'performance gap' between the design of the building and the energy efficiency and thermal performance of the completed building.

A move to the Passivhaus ***'gold standard'*** for all new-build homes would be radical, ambitious, practical and forward-thinking. It would future proof homes and prevent them from having to be retrofitted in the near future, upskill the construction sector and make Scotland a leading player with exportable skills and knowledge. I firmly believe we should grasp the opportunity and be a leader, not a follower.

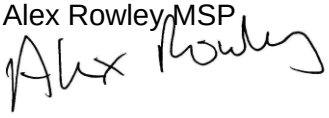
In summary, a warm, dry, comfortable and affordable home is a basic human need and I would contend, human right. By legislating to ensure all new build homes in Scotland meet a Scottish equivalent to Passivhaus design standards we will make homes more affordable to heat, more comfortable to live in and more environmentally sustainable.

Passivhaus homes:

- Consistently perform to design targets eliminating the performance gap
- Are the best fit for a decarbonised grid
- Deliver a huge number of health and wellbeing benefits
- Eliminate fuel poverty
- Are the only realistic way to achieve Zero Carbon

Whatever your views on this proposal I would very much welcome your views on the detail of this proposal through the consultation process.

Alex Rowley MSP



How the Consultation Process works

This consultation relates to a draft proposal I have lodged as the first stage in the process of introducing a Member's Bill in the Scottish Parliament. The process is governed by Chapter 9, Rule 9.14, of the Parliament's Standing Orders which can be found on the Parliament's website at:

https://www.parliament.scot/about/how-parliament-works/parliament-rules-and-guidance/standing-orders/chapter-9-public-bill-procedures#topOfNav

At the end of the consultation period, all the responses will be analysed. I then expect to lodge a final proposal in the Parliament along with a summary of those responses. If that final proposal secures the support of at least 18 other MSPs from at least half of the political parties or groups represented in the Parliamentary Bureau, and the Scottish Government does not indicate that it intends to legislate in the area in question, I will then have the right to introduce a Member's Bill. Several months may be required to finalise the Bill and related documentation. Once introduced, a Member's Bill follows a 3-stage scrutiny process, during which it may be amended or rejected outright. If it is passed at the end of the process, it becomes an Act.

At this stage, therefore, there is no Bill, only a draft proposal for the legislation.

The purpose of this consultation is to provide a range of views on the subject matter of the proposed Bill, highlighting potential problems, suggesting improvements, and generally refining and developing the policy. Consultation, when done well, can play an important part in ensuring that legislation is fit for purpose.

The consultation process is being supported by the Scottish Parliament's Non-Government Bills Unit (NGBU) and will therefore comply with the Unit's good practice criteria. NGBU will also analyse and provide an impartial summary of the responses received.

Details on how to respond to this consultation are provided at the end of the document.

Additional copies of this paper can be requested by contacting me at:

Alex.rowley.msp@parliament.scot

Alex Rowley MSP
Room M1.04
Scottish Parliament
Edinburgh EH99 1SP

Enquiries about obtaining the consultation document in any language other than English or in alternative formats should also be sent to me.

Purpose of the Proposed Bill

This bill will legislate for the introduction of Passivhaus energy efficiency and thermal performance standards, or a Scottish equivalent for all new build housing in Scotland. My aim is that this will apply to the construction of all new build housing.

Passivhaus is a tried and tested building method that provides solutions to deliver net zero housing. The construction method creates air-tight, non-draughty properties with increased amounts of insulation combined with triple glazed doors and windows and eradicates cold bridging and heat loss. Homes built in this way provide a high level of occupant comfort and use very low amounts of energy for heating. They have a mechanical ventilation system designed into them to allow for cooling and the removal of stale air to be replaced by fresh air.

At present in the UK and elsewhere Passivhaus building is an accredited and certified process that requires a stringent quality assurance process before a building is passed as meeting Passivhaus standards. It is carried out and signed off by trained assessors.

The main features of Passivhaus homes are:

- Super insulation
- Stringent levels of airtightness
- Minimal thermal bridging
- Optimisation of passive solar gain
- Mechanical ventilation with heat recovery

The sections below set out detail on current building regulations including the current technical amendments criteria and accreditation and certification processes and how I would envisage these criteria and processes changing under my proposal for a bill.

In addition, this proposed bill seeks to address the ‘performance gap’. In terms of energy efficiency this is the extent of the gap between what is **expected** to be achieved under the current Scottish building standards and what is ***actually*** **delivered.** In order to address the ‘performance gap’ it will be necessary to not only set Passivhaus or equivalent as the new standard in building regulations for all new build housing but to also increase the amount of evidence that needs to be submitted for a completion certificate. Details on this are also provided later in this document.

To prevent this bill from becoming over complex, expensive and unwieldy I have focussed exclusively on new build homes only. Requiring Passivhaus standards in house extensions, retrofitting etc. could come later but this would in my opinion be best achieved via legislation introduced by the Scottish Government. However, I would be open to discussion with the Government or any member of parliament about progressing such matters.

An overview of frequently asked questions on the proposed bill is reproduced at the end of this document (see Appendix). Other appendices providing more detail on the SPICe background material referenced below and more depth on the research basis for this proposal are available at: https://www.alexrowley.org/.

Aim of the Proposed Bill

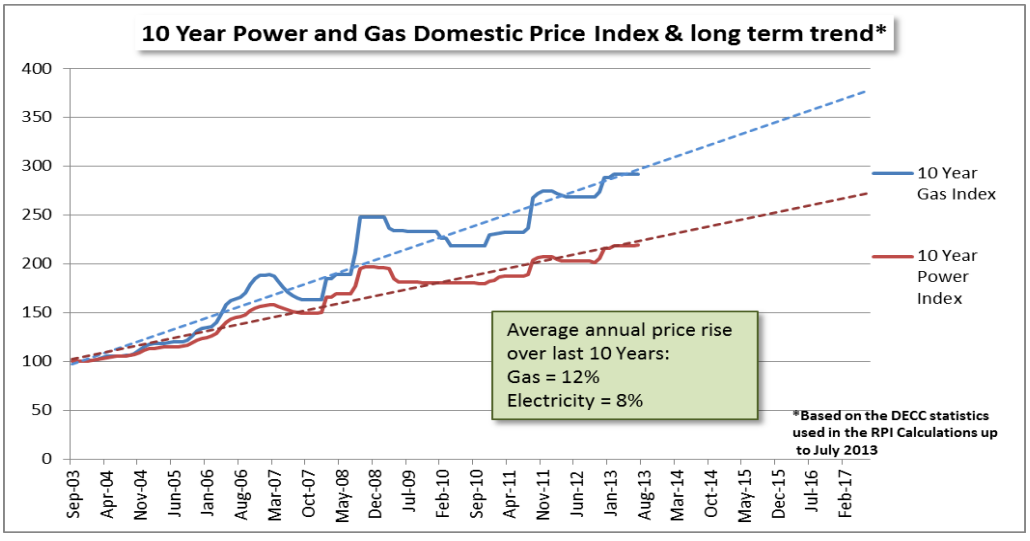
Background

In the run up to COP 26 the International Panel on Climate Change (IPCC) issued a ***'code red for humanity'*** and called on the world to take immediate action to arrest the rise in global temperatures and the catastrophic impact of greenhouse gases. As the focus of the world fell on the Glasgow conference the stakes could not have been higher. The conference itself shone the spotlight on governments across the world and what contribution they can make now and in the coming years to address the climate emergency.

The climate crisis is complex and multifaceted; no one policy decision, plan or speech from a world leader will deliver long-lasting, sustainable change. What is required is an international, cooperative, cross-cutting approach that permeates all sectors and all communities so that collectively we can reduce our level of emissions to net zero.

There is a duty on every citizen, household, NGO, business, government, agency and department to play our part in pulling the world back from the brink.

At the same time, the recent increase in global energy prices has put the issue of fuel and energy insecurity at the top of the political agenda. Inflation busting increases in wholesale gas prices and the collapse of a number of energy companies supplying the domestic market combined with years of austerity, pay cuts and restraint and the removal of the 20% uplift in universal credit has created a perfect storm driving more and more people into fuel poverty.



2

[2] 10-year-power-and-gas-trends-for-domestic-tariff.png (1060×628) (myutilitygenius.co.uk)

The above graph shows that domestic gas and electricity prices have steadily risen over the past decade. The graph shows that gas prices have risen by an average of 12% per year. Electricity prices have risen by an average of 8% per year.

The Scottish Greenhouse gas emissions reported in 2017 that 14.9% of Scotland's emissions come from residential dwellings. Housing, therefore, has a key role to play in delivering on the net zero agenda and the Scottish Government's wider social and economic policy agenda. [3]

However, the overall built environment contributes around 40% of carbon emissions across the UK. Three quarters of this is related to the operational carbon of our built environment principally from domestic heating and hot water. There are proposals to move away from fossil fuelled heat, but this will create significant additional demand on the electricity grid which will in turn require new infrastructure that generates carbon. If we are to reduce energy use and carbon emissions and improve energy efficiency, then it needs to be done through better building fabric and by moving to electrical heating systems powered by renewable energy.

According to John Gilbert architects, ***"In order to meet the UK's net zero commitment every house that is currently being built to minimum building regulations will need to be retrofitted before 2045."***

This consultation paper sets out the case for adopting minimum environmental standards, either the Passivhaus standards itself, or a Scottish equivalent to energy efficiency and thermal performance standards of Passivhaus designs for all new build homes in Scotland. This would be a positive, sustainable move that would reduce emissions and the scale of energy and fuel bills. I seek views on this proposal, including welcoming insight on how the policy provisions in the intended bill might operate in practice.

Passivhaus Standards

The Energy Savings Trust has stated that ***"Passivhaus is the gold standard in energy efficiency"*** [4]

The proposal is to introduce **Domestic Building Environmental Standards (Scotland) Bill** which will set new internationally recognised standards for new build housing in Scotland based on the internationally recognised Passivhaus standard.

[3] Scottish greenhouse gas emissions 2017 - gov.scot (www.gov.scot)
[4] https://energysavingtrust.org.uk/passivhaus-what-you-need-know/#:~:text=Passivhaus%2C%20literally%20passive%20house%20in,maintain%20an%20almost%20constant%20temperature

The Passivhaus Trust gives the following definition of a Passivhaus - **"*A Passivhaus is a building in which thermal comfort can be achieved solely by post-heating or post-cooling the fresh air flow required for a good indoor air quality, without the need for additional recirculation of air.*"**[5]

Professor Dr Wolfgang Feist, Director of the Passive House Institute in Darmstadt Germany says that in a Passivhaus,

'The heat losses of the buildings are reduced so much that it hardly needs any heating at all. Passive heat sources like the sun, human occupants, household appliances and the heat from the extract air cover a large part of the heating demand. The remaining heat can be provided by the supply air if the maximum heating load is less than 10W per square metre of living space. If such supply-air heating suffices as the only heat source, we call the building a Passivhaus'.

Sarah Lewis of the Passivhaus trust said, *'backed with over 30 years of international evidence, Passivhaus is a tried & tested solution that gives us a range of proven approaches to deliver net-zero-ready buildings for Scotland optimised for a decarbonised grid and augmented for occupant health and wellbeing. Passivhaus buildings provide a high level of occupant comfort using very little energy for heating and cooling.'*

Main Features of a Passivhaus:

There are 5 key principles that differentiate a home built to a standard design and one that is Passivhaus certificated.

- ### High-quality insulation

A Passivhaus is highly efficient and exceptionally well insulated. Walls ceilings and floors have additional levels of insulation. It is not so much about the amount of insulation but how it is used. Materials are deployed in a bid to minimise the need for external energy to provide heating. Such an approach reduces heat gain in the summer months and heat loss in the winter. A Passivhaus would normally have around 30cm of insulation. Walls are generally thick and very effective at retaining heat.

- ### Heat control and robust windows

Windows in any housing are a weak point in relation to heat loss and draughts. In a Passivhaus this is addressed by ensuring they are built and fitted to a high standard. They are usually triple glazed to maximise energy conservation and made from

[5] What is Passivhaus? (passivhaustrust.org.uk)

timber or another non-conductive, high quality material. High performing doors prevent draughts and reduce heat loss.

- **Creating an airtight building**

The construction methods used, seek to minimise draughts coming into the home and heat loss leaving it. This is done through the use of an airtight barrier and by the taping of all joints and gaps in the building. An airtight building cuts down energy costs and improves the comfort factor.

- **Heat recovery and ventilation**

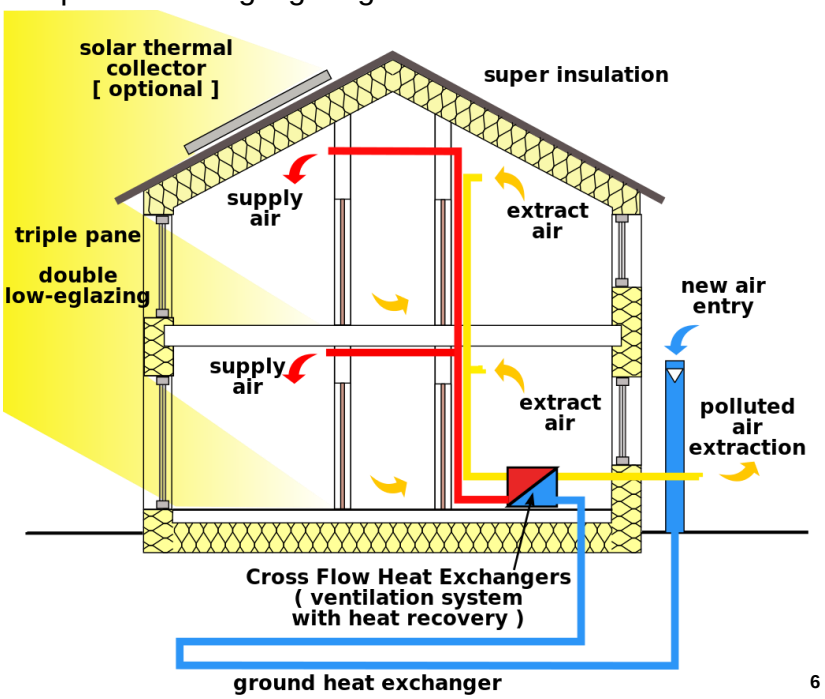
A mechanical ventilation system recovers heat from stale air leaving the building and brings fresh, filtered air into it. This helps prevent the build-up of condensation.

- **Thermal bridge free design**

Eliminating thermal bridges from inside of the home to outside which facilitate heat loss is a vital part of Passivhaus design. These can often be found at the junction of walls and floors, around windows and doors, where there is poor or missing insulation etc.

Illustration of a Passivhaus

Below is an example sketch highlighting the main features of a Passivhaus.



[6] The Passivhaus Standard - BRE Group

Like any other new build home Passivhaus buildings come in many different designs, shapes and sizes. The external cladding of the building can be of any acceptable type - timber, stone, brick, rendered blocks etc. The choice of cladding, roofing and other features has an impact on how much 'embodied energy' there is within the buildings' construction. 'Embodied energy is the energy that is consumed in order to build a given usable object.'

In Scotland timber framed housing construction is common therefore the combination of adopting Passivhaus standards within a timber framed building adds to its environmental credentials by having less embodied energy within its construction than say a building that is built with high levels of steel or concrete.

This bill does not seek to prescribe materials or products or methods to achieve the standards set, but instead seeks to introduce new higher standards that all new build homes must achieve. The objective of this bill is in raising standards not dictating how they are achieved.

The Current Legislative Landscape

The Scottish Parliament Information Centre (SPICe) has set out the existing legislation on building standards in Scotland and this document is reproduced in full on the webpage for the proposal (https://www.alexrowley.org/). Key extracts are also provided in italics below.

In summary, *The Building (Scotland) Act 2003 gives Scottish Ministers the power to make building regulations to*: *secure the health, safety, welfare and convenience of persons in or about buildings and of others who may be affected by buildings or matters connected with buildings; further the conservation of fuel and power; and further the achievement of sustainable development.*

Building standards are currently set out in the Building (Scotland) Regulations 2004; the system aims to ensure building work meets the minimum standards of design and construction set out in building regulations. The system operates in the public interest, rather than to protect the interests of individual property owners or developers.

The Building (Scotland) Regulations are made by the Scottish Ministers and subject to approval by the Scottish Parliament. Guidance on the implementation of these Regulations can be found in The Scottish Building Standards Procedural Handbook.

The Building (Procedure) (Scotland) Regulations 2004, as amended, set out the procedures to be followed in connection with the submission of applications for building warrants, completion certificates and other related matters, including:

- ***Technical Handbooks***
  These provide detailed technical guidance for building industry professionals on how to meet required building standards. Verifiers should accept a proposed design if guidance from handbooks has been complied with.

- ***Verifiers***
  At present, only Local Authorities have been appointed building standards verifiers. The Building (Scotland) Act 2003 gives Scottish Ministers the power to appoint other organisations but to date, this has not been done**.**

- ***Building Warrants***
  The confirmation of permission to erect a new building or alter, extend, convert or demolish an existing building. Where proposed works meets the requirements of Building (Scotland) Regulations 2004, a building warrant should be issued by a verifier.

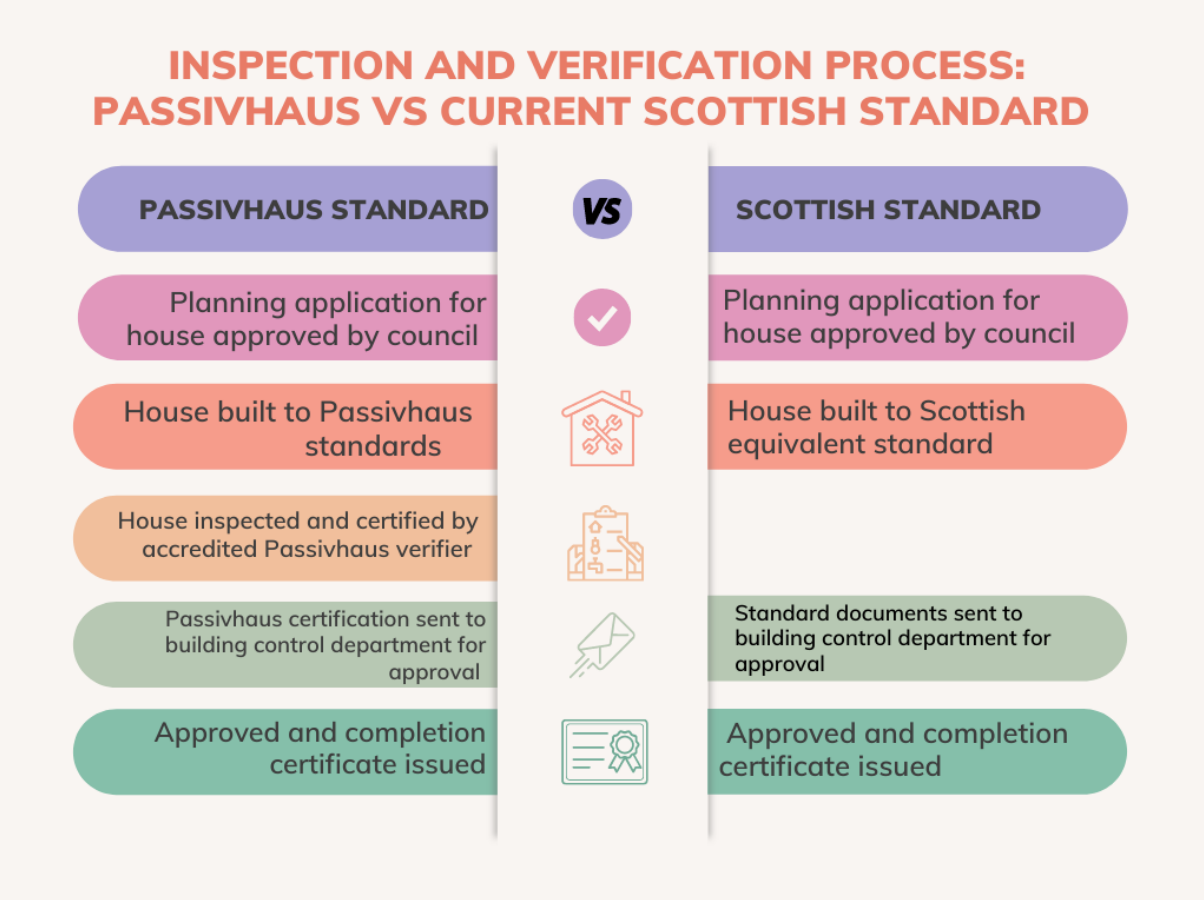
- ***Completion Certificates***
  Property owner or their agent must submit a completion certificate to the verifier confirming that the building has been constructed, altered or converted in accordance with the building warrant and the Building (Scotland) Regulations 2004.

- ***Reasonable Inquiry***
  Verifiers must undertake ”reasonable inquiry” to confirm compliance with the details set out in the building warrant and in building regulations, before accepting a completion certificate. This may include site visits, photographic evidence and considering test reports or certificates of construction.

- ***Local Authorities Enforcement Powers***
  The Building (Scotland) Act 2003 gives Local Authorities formal powers to deal with: work done without a building warrant when one was required; work not done in accordance with the building warrant and building regulations where a building warrant has been obtained; and buildings they consider defective or dangerous.

Proposed inspection and verification process

I have set out the inspection and verification process for new build homes that would apply following the introduction of the provisions of the proposed bill alongside details of current processes.



Under my proposal, the first stage above of application for approval to build would involve a requirement for the design to meet Passivhaus standards or a Scottish standards equivalent to Passivhaus energy efficiency and thermal performance standards. The best current reference for the design standards and technical amendments criteria are set out in the existing Passivhaus Planning Package (PHPP).

Once the housing receives planning permission and has been built, an accredited verifier, trained and qualified in the relevant energy efficiency and thermal performance standards would inspect the building and, if satisfied, grant the required certification. **I would welcome views in this consultation as to whether the verifier should be part of the relevant Building Control Department, whether the relevant BCD could contract qualified verifiers, or whether the verifiers should sit entirely separate and independent of the Department.**

In terms of closing the performance gap, to ensure there is no performance gap in a building built to these standards (i.e. the equivalent of Passivhaus standards), the two stages above contribute to achieving this. Firstly the design standards would include features such as the correct level of airtightness, a strict limit on thermal bridging, the inclusion of filtered fresh air recovery amongst other specific features. The existing PHPP, that these design standards would be based upon is a very accurate tool for predicting in-use performance. This first step, combined with on-site

testing of these standards required for certification will ensure not just that the design complies but that the housing itself performs to the energy efficiency and thermal performance standards required.

Fuel Poverty

A household is considered fuel poor if, after housing costs have been deducted, more than 10% (or 20% for extreme fuel poverty) of their net income is required to pay for reasonable fuel needs and, after further adjustments are made to deduct childcare costs and benefits received for a disability or care need, their remaining income is insufficient to maintain an acceptable standard of living (see Appendix III).

Fuel Poverty is caused by a combination of factors: poor energy efficiency of a dwelling; low disposable household income, the high price of domestic fuel and how energy is used in the home.[7]

Those living in fuel poverty disproportionately live in houses and flats that have poor levels of energy efficiency, heating systems that are more expensive to run and homes that are constructed of materials that make retrofitting more difficult. The combination of these and other factors such as overcrowding, poor maintenance by landlords and low household incomes are all factors that in any year could plunge people into fuel poverty but 2021 was exceptionally bad due to one additional and very significant pressure, the rise in energy prices.

Gas Price Rises

Over the course of this year, the sharp rise in wholesale gas prices resulted in more and more individuals and families falling into fuel poverty.

This rise in wholesale gas prices and competition between energy providers to secure customers has resulted in a crisis in the domestic market as fuel bills have reached unprecedented levels. As prices rose, customers who were on longer-term fixed price contracts found their energy provider selling gas and electricity to them for less than it cost them to buy it wholesale. This was an unsustainable position resulting in a rush of smaller but not insignificant suppliers going bust.

At today's prices electricity is around four times more expensive than gas, so by phasing out gas heating in new build housing by 2024 as proposed by the Scottish Government, we risk pushing more people into fuel poverty, unless heat pump installation is coupled with significant improvements in the energy performance in our new buildings and a major retrofitting programme in older properties.

Therefore, replacing cheaper gas for heating with more expensive electricity will only work if homes are able to use that electricity in an efficient and effective way. It cannot be met by decarbonising the grid because the capacity of the grid has limits.

[7] Causes of energy poverty [2] | Download Scientific Diagram (researchgate.net)

Whilst the potential of renewable energy is very significant the capacity to harvest it is not - there is a financial and carbon cost to all renewable technology. Like fossil fuel generated energy, renewable energy and storage capacity has to be shared across all sectors.[8]

Fuel Poverty across the UK

The gas price crisis has significantly increased awareness of fuel poverty across the whole of the UK. The application of different methodologies to calculate fuel poverty rates in each of the different nation states makes it difficult to carry out an accurate and direct comparison of fuel poverty rates. However, the estimate from the House of Commons library dated July 2021 suggests 25% of households in Scotland were classed as fuel poor, 13% in England, 12 % in Wales and 18% in Northern Ireland.[9]

The Impact of COVID-19

A House of Commons library report states that *'Analysis from March 2020 by the comparison site Uswitch suggested that UK consumers could spend an extra £52 million a week in total on energy bills. The research suggests households with people working from home each spend an extra £16 a month extra on energy, a total of £195 a year for those on poor-value tariffs'.*[10]

From this, we can see that for low-income households one of the consequences of the increase in home working is a consequential rise in home energy bills from additional heating, lighting, computer use etc. Some employers have helped with these costs by paying an additional amount to homeworkers, whilst others can claim a small amount of tax relief of £6 per week, via HMRC. However, for those living in homes with poor energy efficiency, increased levels of home working is likely to send them further into fuel poverty.[11]

By building all new homes to the highest possible energy efficiency standards we can ensure that future generations of tenants and homeowners do not experience the fuel poverty experienced by too many people today.

Jim Brown of Stewart and Shields builders, a construction company of over 50 years standing builds to the Passivhaus standard he said, *'As a builder it gives me a great sense of achievement that we are able to build homes knowing that no one who lives*

[8] UK Passivhaus Trust graph, data collected from
(i) -Decarbonising domestic heating: What is the peak GB demand?, Watson et al, ScienceDirect.com, March 2019
(ii)- www.nationalgrideso.com/future-energy/future-energy-scenarios/fes-2020-documents
(iii)-UK housing: Fit for the future?

[9] https://researchbriefings.files.parliament.uk/documents/CBP-8730/CBP-8730.pdf

[10] Fuel Poverty - House of Commons Library (parliament.uk)

[11] Martin Lewis: Working from home due to coronavirus, even for a day? Claim TWO years' worth of tax relief (moneysavingexpert.com)

in them will suffer fuel poverty and that by doing so families will have more money to spend on food, clothing and other essentials. That is something we are very proud of.'

The Scottish Government's New Statutory Targets

The new fuel poverty statutory target (section 2 of the Fuel Poverty Act) is to ensure that, in the year 2040 as far as reasonably possible no household is in fuel poverty and:

- No more than 5% of households in Scotland will be in fuel poverty
- No more than 1% of households will be in extreme fuel poverty
- The median fuel poverty gap of households in Scotland in fuel poverty is no more than £250 (adjusted to take account of changes in the value of money)

The Scottish Government's Energy Efficient Scotland programme will be the primary delivery mechanism for eradicating fuel poverty by 2040.

The strategy states, *'Our homes and workplaces account for around 21% of Scotland's total greenhouse gas emissions. We can and must make very significant progress towards eliminating emissions from the way we heat our buildings over the next decade and reduce them to zero by 2045. Transforming our homes and workplaces will be immensely challenging, requiring action from all of us, right across society and the economy'.*[12]

The strategy's key priorities include:

- Reducing carbon emissions
- Reducing fuel poverty
- A commitment to a 'fabric first' approach to reduce emissions, cut fuel bills and keep homes warm

It goes on to say *'We are therefore aiming to reach high standards of energy performance across all buildings whatever heating systems they use. For homes this will mean achieving energy efficiency levels broadly equivalent to an EPC rating of Band C'.*[13]

'Achieving emissions reductions in buildings will require by 2030 over 1 million homes and an estimated 50,000 non-domestic buildings to convert to using zero or low emissions heating systems. We are committed to taking action to rapidly scale

[12] Heat in buildings strategy - achieving net zero emissions: consultation - gov.scot (www.gov.scot)
[13] Heat in buildings strategy - achieving net zero emissions: consultation - gov.scot (www.gov.scot)

up deployment rates so that at least 64,000 homes install renewable heating systems per year by 2025, and possibly many more.'[14]

In relation to new build housing, the strategy goes on to say:

'While new buildings represent only a small part of the decarbonisation challenge, we cannot add any new emissions because of the rapid decarbonisation efforts needed to reach net zero. We will require new buildings, starting with new homes consented from 2024, to use zero direct emissions heating, and also feature high levels of fabric energy efficiency to reduce overall heat demand so that they do not need to be retrofitted in the future.'[15]

'We will continue to prioritise action on energy efficiency. To deliver regulations to support the installation of cost-effective 'energy efficiency first' improvements in all buildings (e.g. roof, windows, wall and floor insulation); both the retrofit of existing buildings and increased energy performance of new buildings'.[16]

Emissions for reporting against targets

The most recent Scottish Government Climate Change Plan sets out four policy outcomes for this sector, the indicators for which are summarised below:-

- The heat supply to our homes and non-domestic buildings is very substantially decarbonised, with high penetration rates of renewable and zero emissions heating.

- Our homes and buildings are highly energy efficient, with all buildings upgraded where it is appropriate to do so, and new buildings achieving ultra-high levels of fabric efficiency

- Our gas network supplies an increasing proportion of green gas (hydrogen and biomethane) and is made ready for a fully decarbonised gas future.

- The heat transition is fair, leaving no-one behind and stimulates employment opportunities as part of the green recovery[17]

[14] Heat in buildings strategy - achieving net zero emissions: consultation - gov.scot (www.gov.scot)
[15] Heat in buildings strategy - achieving net zero emissions: consultation - gov.scot (www.gov.scot)
[16] Heat in buildings strategy - achieving net zero emissions: consultation - gov.scot (www.gov.scot)
[17] Climate Change Plan: monitoring reports - 2021 compendium - gov.scot

In **all** areas, the report concludes **it is too early to say whether progress is being made to the extent that targets will be met.**

Looking at all of these indicators it is clear that more robust, proactive and urgent action is required if the Scottish Government is to meet its own overall emissions target and those relating to emissions from residential properties.

Indeed, Scotland's First Minister Nicola Sturgeon has acknowledged the failure to meet climate targets 3 years in a row. In a speech ahead of the COP26, she said,

"Scotland ranks well in most comparisons of international climate targets and aims to end its contribution to climate change by 2045. She accepted the country had "fallen short on our last three annual milestones". She added: "Two years ago, our emissions were 51.5 per cent lower than in 1990. But to meet that year's annual target, they needed to be 55% lower". Ms Sturgeon said Scotland is "determined to play our full part" but "our ability to do that depends on our own climate credibility". She added: "Scotland cannot urge other countries to set and meet ambitious targets if we fail to do so ourselves. "We must lead, not by the strength of our rhetoric, but by the power of our example."The law in Scotland stipulates that if we miss any annual targets, we must outperform in future years to make up for it." [18]

I believe that my proposal will make a significant, sustained and sustainable contribution to Scotland's emissions catch up plan and long term objective to reach net zero and towards fuel poverty targets.

Scottish Government Consultation on Building Standards

From July to November 2021, the Scottish Government consulted on new building regulations which could introduce changes to support the implementation of a new build heat standard from 2024.

Amongst other things, the consultation sought views on an introduction of an energy target for new buildings and options for uplift in standards for new dwellings, including proposals on use of zero direct emissions heat sources, heat pumps and natural ventilation.

Whilst any improvements in energy efficiency, emissions reductions and improved building standards are to be welcomed, if Scotland is to meet the previously described fuel poverty and energy efficiency targets and its climate obligations then we will need to see a much more radical approach that delivers rapid change at an appropriately high standard. These changes cannot be achieved by decarbonising the grid alone as the capacity of the grid has to be shared by all sectors. Whilst we do need to take action to reduce the grid's reliance on carbon this will not eradicate fuel poverty or meet our energy efficiency targets with additional action across all sectors. A step change is required on many fronts.

[18] Sturgeon to publish 'catch-up' plan after Scotland misses climate targets | HeraldScotland

The Scottish Government proposals do not include consideration of the wholesale introduction of Passivhaus standards for all new build housing. I consider that the level of change being considered in the options set out by the Government will not make sufficient progress towards eradicating fuel poverty or meeting our efficiency targets. I believe that legislation is required to change standards to make a far bigger contribution towards these aims.

Training and Skills

The volume house builders who dominate the new build market have their tried and tested systems. Their experience and expertise sees factory made timber frame kits delivered to site, erected and finished quickly, efficiently and profitably. It is therefore understandable that some may be resistant to change through fear that it will impact their business model. However, building to the Passivhaus standard or a Scottish equivalent does not require anyone to throw existing construction methods and all that they have learned over many decades into the bin; it simply requires existing practice to be 'tweaked' and amended. Using the Irish example in person training courses, online webinars, onsite learning, toolbox talks have all been used to train architects, designers, builders and craftsmen.

Jim Brown of Stewart and Shield Ltd. builders said, *'Adopting the Passivhaus standard is more of a mindset than anything else. By training your workforce in the standard it builds their skills and pride in their work all of which has a very positive impact on everything we do. This proposal could be a very positive development for the industry.'*

And the Passivhaus Association of Ireland says, *"The passive house standard is essentially open source and can be built using virtually any construction materials and methods. To date in Ireland, passive houses have been built using cavity wall construction, timber frame, steel frame, single leaf masonry with external insulation, structural insulated panels, insulating concrete formwork and even hempcrete. It's just a question of careful detailing and workmanship to ensure continuity of insulation, airtightness and a seamless ventilation approach. The industry may not be aware of this yet, but the real threat to traditional construction surely exists in trying to meet stringent theoretical energy targets in building regulations without being informed by building-science based, quality assured approaches such as passive house. Throwing insulation and gadgetry at a building without due care for the consequences is a dangerously misguided approach. Rather than being a threat, Passive House can actually help boost the construction sector."* [19]

[19] FAQ | Passive House Association of Ireland

Building for the Future – international examples

For EU member states the European Energy Performance of Buildings Directive 2010 requires all new buildings to be nearly Net Zero Buildings (nZEb) by 31st December 2020 and all buildings acquired by public bodies by 31st December 2018. This means that any buildings completed after these dates have to achieve the standard irrespective of when they were started.

Whilst nZEb standard is undoubtedly a step in the right direction, Britain's exit from the EU means the UK is no longer bound by these standards. We, therefore, have an opportunity to introduce new higher standards.

In the Republic of Ireland, the government introduced a 'transition fund' to 'wake up the market' and encourage Passivhaus construction**.** Architects such as Mosart who are based in county Wicklow have been building to Passivhaus standards for 20 years. They have completed a range of developments in the Republic of Ireland and New York City. These include one-off privately commissioned houses, multi-storey high rise buildings, student accommodation, retrofit projects and new build Council house developments. They have recently tendered for a 600 unit council house project in Dublin. All units will be built to Passivhaus standard.

Tomas O'Leary, a partner with the company said, ***'In layman's terms, as a comparison of levels of energy efficiency nZEb is 7 out of 10, Passivhaus is 10 out of 10. So let's not settle for second best when we can reach for the top and make such a big difference to people's lives.'***

In Belgium the Brussels city region has adopted the Passivhaus standard, meaning that ⅓ of the country is now building to it and the German city of Heidelberg has also signed up.

Examples of Passivhaus in the UK

In the UK, over 50 housing associations and other social housing providers have built homes to Passivhaus standards; the largest development to date is a 72 house project in Plymouth.[20]

One resident living on the Plymouth estate said, *"We've hardly had the heating on. Even during that really snowy and cold weekend, we reckon we only paid £4 that*

[20] Passivhaus Social_List of LA HA who have delivered Passivhaus homes.pdf (passivhaustrust.org.uk)

weekend on gas. I think we're paying something like £1.40 a day on gas and electricity, and it's not like we've been holding back."[21]

In Scotland, Kingdom Housing Association have secured planning permission to build 30 homes near Dundee and in the Trossachs National Park and Hanover housing association are building 15 affordable Passivhaus homes at Drymen.

Alex Rowley MSP with representatives of Hanover Housing Association and Cruden at their Drymen project.

According to the association *"this eco-friendly new development will use up to 90% less energy for heating and cooling and up to 70% less energy than conventional buildings through measures including solar photovoltaics on the roof and triple glazed windows. The ventilation systems installed in Passivhaus homes means that residents will benefit from a constant supply of fresh air whilst maintaining a comfortable indoor air temperature. The high-performance insulation and windows also make such buildings extremely quiet, and homes will be surrounded by a wildflower meadow to further improve biodiversity."*

Angela Currie, chief executive of Hanover Scotland, said:*"By implementing Passivhaus standards at our development in Drymen, we will be building very energy efficient homes with hugely reduced carbon emissions. For our residents, this will mean significantly reduced energy bills and homes that are comfortable, healthy and affordable. Passivhaus standard construction will allow residents to keep their homes warm without worrying about the cost and with the added benefit of knowing that the approach is beneficial to the environment."*

The project is being built by long established building firm Cruden whose director Gordon Lee said*: "Protecting the environment and building sustainably has never been so important and Cruden is delighted to begin work on this important*

[21] Passivhaus News (passivhaustrust.org.uk)

development for Hanover within Loch Lomond & Trossachs National Park. As well as building these highly energy-efficient, green homes which make a huge difference to local residents, we will also be bringing a range of community benefits, including employment and training opportunities to this area."

The Performance Gap

The concern of those campaigning for improved standards of energy efficiency in new build homes is the extent of the gap between what is **expected** to be achieved under the current Scottish building standards and what is ***actually*** **delivered -** this is referred to as 'the performance gap'**.**

On this the zero carbon hub say,

'In recent years, the housebuilding industry and government have grown increasingly concerned over the potential gap between design and 'as-built' energy performance. It could undermine a building's vital role in delivering the national carbon reduction plan, present a reputational risk to the housebuilding industry and damage consumer confidence if energy bills are higher than anticipated.'[22]

There is little consumer protection regarding the performance of homes other than challenging and proving negligence on the part of the development team in the courts.

Council Building Control Departments are often incorrectly perceived to perform a quality control function but this is not the case as responsibility for compliance remains with the builder. The energy rating of a property is a theoretical estimate of how different house types and designs perform in relation to energy efficiency. It is

[22] Performance Gap | Zero Carbon Hub

not based on an actual individual and verifiable assessment of each new build dwelling.

The performance gap is the gap between what level the housebuilder claims the house will perform to as per the Energy Performance Certificate (EPC) rating and what is actually delivered. Studies suggest this can be as much as 60%.[23] Whilst any new build home requires a completion certificate and Energy Performance Certificate from the local authority they do not require a home report or any verification or independently certified assurance that their new home will perform to the standard claimed.

Crucially, the EPC is a cost-based index - the rating is granted on the basis of the cost of energy used in the home. This means that a property using gas over electricity will have a better EPC rating as gas is significantly cheaper than electricity. This is despite the fact that reducing emissions rate in electricity means electricity-based dwellings are more energy-efficient than those still using gas.[24]

John Gilbert architect confirmed this, ***"There are very few consumer protection laws around new housing and ensuring quality construction is a bit of a lottery for new home buyers."***

Conversely,at present in the UK evidence of meeting the Passivhaus standard is submitted to and audited by an independent external body to ensure it meets the Passivhaus standard. There should therefore be no performance gap in an accredited Passivhaus building.

A project to examine the performance gap in new build homes has been undertaken by the zero carbon hub. It has brought together 140 industry experts from 90 companies to identify areas that need to be addressed if the performance gap is to be eradicated.

In their interim progress report, ***Closing the gap between design and as-built performance***[25] they say:

'There is a general lack of understanding across developers, designers and planners about the potential impact they can have on energy performance and buildability."[26]

[23] Performance Gap | Zero Carbon Hub
[24] EPCs as Efficiency Targets
[25] Closing the Gap between Design & As-Built Performance (zerocarbonhub.org)
[26] https://www.zerocarbonhub.org/sites/default/files/resources/reports/Closing_the_Gap_Between_Design_and_As-Built_Performance-Evidence_Review_Report_0.pdf

The report goes on to highlight concerns including: lack of a robust energy performance tool; the need for products to be tested for energy performance as systems of fabric rather than individual components; problems associated with adoption of improvised approaches being used on site without understanding of energy performance implications; requirement for a review of thermal bridge calculations; and that knowledge, skills and working practices within the industry are a serious concern and will have an influence on both the performance gap and the ability to close it.

The involvement of so many players within the industry and the seriousness with which they are taking the issue of the performance gap shows it is a significant issue.

An example of how energy standards can be significantly improved is in the School Building Programme funded by The Scottish Futures Trust. As part of the funding conditions developers are required to show that they have met strict energy performance standards. Funding is then reduced based on any performance gap post completion, using a sliding scale. Whilst this approach could be applied to the award of social housing funding, it would not impact on housing projects which do not attract government financial support. This is why a legislative approach is required.

Current Regulations vs Passivhaus – comparing performance

Comparing the performance of similar flats built to current building regulations and Passivhaus standard we can see the advantage of the latter approach.

John Gilbert Architects report, *“We have undertaken the following research for a Housing Association in which Scottish building regulations standards homes and Passivhaus standard homes were compared using Standard Assessment Procedures. Whilst SAP is not the best tool for estimating energy use, we did find that Passivhaus homes do perform better in practice and show a significant reduction in energy demand for heating, hot water and associated energy bills.*

Using SAP to estimate the performance of Passivhaus:

- Three bedroom house to Scottish Building Standards all electric (with 3kWp PV) - 23.54 kgCO2/m2
- Three bedroom house to Passivhaus Standards all electric (no PV) - 17.80 kgCO2/m2

So there is an approximate 25% reduction in CO2 before a Passivhaus needs a

Photo voltaic (PV) panel. PV is good on an individual level but on a national level, the importance of reducing winter energy demand, thereby saving national infrastructure is critical. The current regulations do not incentivise energy reduction (they focus on carbon reduction which is different) which means we are seeing homes with high energy demand adhere to building regulations by 'offsetting' with PV panels."

Using gas the performance is similar between the two in SAP but the heat demand is very different. Passivhaus has 85% less energy demand than a home built to Scottish Building regulations. Reducing energy and reducing Carbon are not the same thing, we need to reduce energy demand as the main route to reduce carbon.

The following is feedback from one of the residents of a John Gilbert Architects Passivhaus built home in the Scottish Borders:

"Michelle Carmichael explained that her previous home had been a private let and was very badly insulated, as a result, her fuel bills were sky-high. Now living in a Passivhaus Michelle says she pays her utility bills by direct debit, and she now finds she is in credit paying about £15 a month for gas and £60 a month for electricity – so very much cheaper and reassuring to know there is some extra banked up before winter months. Michelle also mentioned that since moving she has found her health has improved as she has asthma, and the fresh air quality is helping her. Michelle said her home is generally always warm and she has only had the heating on twice since she moved in. Michelle said: "Moving to this Passivhaus has been an amazing transformation for me and my family. It has been brilliant, and I feel that this is my forever home."

Public Support

Whilst public awareness of Passivhaus construction may be limited, it is growing and it is clear that when people are informed and made aware of the benefits of this approach, support for it grows. This can be seen in the report from the Scottish Climate Assembly where 97% of its members agreed with the call to "Update building standards to ensure that, within the next 5 years, all new housing is built to Passivhaus standards (or an agreed Scottish equivalent), to create healthy homes for people while also taking into account whole life carbon costs and environmental impact."

It would be reasonable to assume that not all of the Assembly's members would have been fully aware of Passivhaus construction prior to their involvement in the project but the discussion and debate around it resulted in almost 100% of members, who are a representative sample of Scottish society, supporting the call which is one of the recommendations the assembly has made to the Scottish Government.

Barriers to Adopting the Passivhaus Standard

Builders

Homes for Scotland, the body representing house builders have in correspondence set out their objections to this proposed bill. Whilst they support moves to improve energy efficiency and meet environmental targets they say, *'At a time when Scotland continues to have a chronic shortage of housing across all tenures, achieving these changes i.e. the changes proposed by the Scottish Government, already presents significant challenges, particularly in relation to grid capacity, supply chain readiness and lack of the necessary skills. A move to Passivhaus would add greatly to these challenges by increasing design cost and complexity, construction capital costs and build programmes."*

It is however notable that they do not address the issue of the performance gap, fuel poverty or the reliance on the continued demand for energy (even though it may be renewable) to heat homes. It has been repeated throughout this document that the cheapest and most environmentally sustainable energy is the energy you do not use. The very significant reductions in energy use from whichever source must therefore form a major part of the consideration of this proposed bill.

Scottish Government

As set out above, the Scottish Climate Assembly as part of it deliberations had called for the following:

'Recommendation 7: *Passivhaus Standards for New Build Update building standards to ensure that, within the next 5 years, all new housing is built to Passivhaus standards (or an agreed Scottish equivalent), to create healthy homes for people while also taking into account whole life carbon costs and environmental impact.*

And the Children's Parliament said: Make sure new houses are built to be environmentally friendly. This would involve making them energy efficient.'

However, in its response published in December the Scottish Government said, *'The proposals for new homes within the consultation include an option which approaches, but is not the same as, the performance associated with the Passivhaus standard. We are seeking views on what is achievable at a national level in Scotland at this time and agree that further capacity for improvement remains. We are not proposing adoption of an existing standard, such as Passivhaus, but are investigating how good practice from such very low energy standards can support*

improved compliance with building regulations and more assurance on performance in practice. We will publish a consultation response early in 2022, and intend to introduce revised standards later that year. We will ensure the recommendations on standards made by the Assembly are included within the response to this consultation. [27]

I believe this is a very disappointing response from the Scottish Government rejecting the views of the assembly which is a representative sample of the Scottish population. Their proposal to adopt Passivhaus or a Scottish equivalent was overwhelmingly supported by assembly members. In doing so Scottish Ministers are undermining the work of the body they themselves established.

Consequences of not building new homes to Passivhaus standards

Whilst it is accepted that within the housing sector concerns around energy efficiency and fuel poverty are most around older housing stock. The terms of this proposed bill relate only to new build homes.

Homes for Scotland have advised that, they *'have been working collaboratively with their members and Building Standards to ensure that our sector gets to net zero by 2024, in line with the timeline for a ban on gas boilers. This requires a smooth transition from one model of delivering heat to a new one.'* This is very welcome and shows the industry is working constructively and positively making a significant contribution. And whilst investment in the efficiency of new build homes has supported a direct reduction in carbon emissions through progressive step-changes in fabric efficiency, building standards and the use of low carbon energy generating technologies, there is no doubt we need to go further and faster as performance gap concerns remain. If left unaddressed then the fear is many newly built homes completed today will have to be retrofitted in the very near future if they are to meet any newly developed and exacting standards.

Scotland's Opportunity to be a Trailblazer

At the COP26 conference in Glasgow, there was a great deal of talk about how Scotland could act as a global leader in reducing emissions. However, this requires practical policy implementation on the ground to back up lofty political rhetoric. Whilst commitments to a national energy company and a renewables revolution have

[27] Scottish Government Response to Scotland's Climate Assembly: Recommendations for Action (www.gov.scot)

fallen by the wayside, there is an opportunity for Scotland to lead the UK and be an exemplar for the rest of Europe in new homes energy efficiency.

Financial Implications

There are of course financial implications of introducing the proposed bill. The additional costs of building to the equivalent of Passivhaus standards is estimated to be between 4% - 8%. There would also be costs associated with the additional verification process outlined above. Further to this there will be a financial cost in training construction workers and equipping local authority building control departments to work to new standards but I believe investment now will save money in the longer term. There have been many new initiatives in the construction industry over the years such as the introduction of timber frame building, cavity wall insulation, central heating, ground source heat pumps etc. and the industry has upskilled the workforce to meet the challenge. The cost of these initiatives are met by the developer and incorporated into their costs. A cooperative approach involving employers, skills agencies, Government, trade unions and others will help deliver the new training required for architects, tradespeople and those responsible for carrying out certification and verification. [28]

Some within the construction sector have raised concerns about the increased cost of all new build homes meeting the Passivhaus standard or a Scottish equivalent. It is generally accepted that upfront costs are higher. These are made up of the additional cost of elements such as triple glazing, insulation, materials and labour.

Economies of scale mean that the volume building of Passivhaus homes will reduce the affordability gap between building to current housing standards and Passivhaus standards. On a £200,000 – £400,000 build cost, this would add £8,000 – £16,000.

The next graph shows the cost comparison of build costs between building to different standards.

[28] Passivhaus Social: Maximising benefits, minimising costs by Passivhaus Trust - Issuu

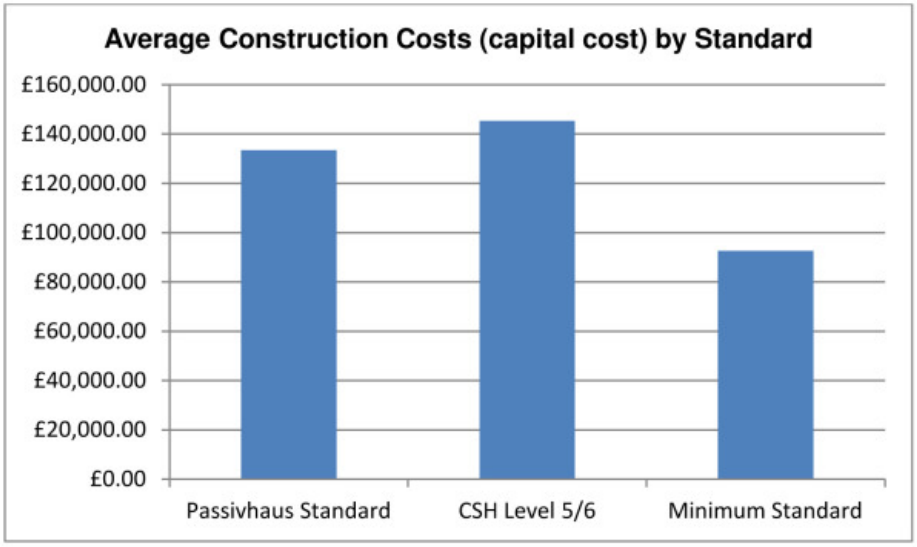


Figure 17 – Average Construction Costs by Standard [29]

Whilst the graph above shows Passivhaus capital costs are higher the financial benefits over the longer term significantly outweigh the cost of initial outlay.

The Passivhaus trust advises that *"the cost of building more efficiently is 3-4pence per kWh, over a 60yr life cycle. The cost of generating that kWh rather than saving it is more expensive, in every scenario, for all forms of renewable energy - The cheapest, and most sustainable, energy is the energy you do not use in the first place."*

Focussing only on build cost is a very narrow way to consider affordability and cost-effectiveness. One of the main advantages of Passivhaus living is that increased levels of insulation and reduced drafts and heat loss mean less energy is required to run a home, therefore fuel bills are considerably lower and emissions reduced. So, if we take a longer-term financial outlook, then the additional upfront construction costs are quickly recouped. And if we apply a monetary value to the reduced emissions the cumulative financial savings are even greater. The simplified design of Passivhaus homes and improved local supply chain will also help drive down costs.

Building a Passivhaus is the epitome of a spend to save approach. By investing now, we save both financially and environmentally over the term of the project. This is central to the preventative agenda that the Scottish Government, councils, many public bodies and NGOs claim to champion.

There have been claims that Passivhaus cannot be delivered at scale but this is not the case. As far back as 2010, Hastoe Housing Association delivered a 14 unit project of houses and flats at Wimbish, Essex. The development is certified to

[29] https://passivhaustrust.org.uk/news/detail/?nId=462

Passivhaus standards. The average heating costs for these houses is £130/year. [30] In 2021 there are over 7,000 Passivhaus units in development around the UK, with many projects delivering 100+ units, including sites in Scotland.

In 2014 it was estimated that the effect of fuel poverty alone cost the NHS in Scotland up to £80m per annum. Cold, damp, condensation, overcrowding, poor heating, draughts and poor insulation and inadequate heating all contribute to this.

A cost-benefit analysis by Professor Christine Liddell identified that investing £1 in improving affordable warmth delivered a 42 pence saving in health costs for the NHS.[31]

National Energy Action suggest that up to 10,000 people a year die as a result of cold homes in the UK. People who live in energy efficient homes have been found to be in better health, with improved mental wellbeing, reduced contact with the health service and fewer absences from school or work. Savings to the public purse go hand in hand with improvements to the lives of those affected with increased mobility, healthier lifestyles, improved nutrition, more social connection and interaction and an increase in happiness.

Therefore, in addition to the considerable benefits in terms of wellbeing and promoting and protecting the environment, I consider there would be significant savings in the public sector from the proposed bill. I would welcome views and insight on the potential costs of the proposed bill including the costs I identify above and any other anticipated costs.

Sustainability

The principles of sustainable development are:

- Living within environmental limits
- Ensuring a strong, healthy and just society
- Achieving a sustainable economy
- Promoting effective, participative systems of governance
- Ensuring policy is developed on the basis of strong scientific evidence

As part of the policy development process a Sustainable Development Impact Assessment (SDIA) has been carried out on the provisions of the proposed bill.

[30] Net Zero Carbon Toolkit (cotswold.gov.uk)
[31]https://www.gov.scot/publications/fuel-poverty-target-definition-strategy-scotland-bill-fuel-poverty-strategy/pages/8/

In a report published in 2016 by NHS Scotland[32] it stated:

"Housing has the potential to reduce or reinforce health inequalities. It exerts a substantial influence on health and wellbeing through several linked routes, including: the affordability of homes; the quality of homes; and the role of the home as a platform for inclusion in community life". Sadly, there are still many people who do not live in a home which is warm and comfortable. Public Health Information Scotland in a report from 2021[33] stated "the link between poor-quality housing and health and wellbeing means that housing quality is an important health inequalities issue. In particular, cold and damp housing is associated with respiratory conditions and poor mental health and wellbeing. There is an ongoing need to raise and maintain the quality of existing housing across all tenures.

A warm, dry and comfortable home is a basic human need. This proposal will help to ensure that all new build homes in Scotland are more affordable to heat and environmentally sustainable for present and future generations. At this current time, when many people are experiencing financial hardship due to a steep rise in the cost of living especially in relation to energy costs, these type of new build properties are needed more than ever.

As previously set out environmental sustainability is central to this proposal. My proposed bill I believe will significantly contribute to the necessary reductions of Co2 emissions that Scotland must make to meet its environmental targets and put less demand on the national grid as it seeks to decarbonise. It will also improve energy efficiency, lower fuel consumption and reduce fuel bills. This will be good for the environment and for those who live in these new and well-built homes.

Energy efficiency and low emissions are undoubtedly two of the most impressive and notable features of Passivhaus construction, however the level of comfort and well-being of residents is another important factor.

Building to the Passivhaus standard eradicates draughts and cold spots, and during periods of warm weather excessive overheating. A constant supply of fresh, clean air is designed into the home with quality windows, insulation materials and mechanical ventilation installed which can filter out pollutants, odours etc. whilst creating a comfortable ambient living environment.

The Covid pandemic and its fallout has seen most of us spending more time indoors therefore internal comfort and well-being are more important than ever. Passivhaus buildings provide a healthy and quiet indoor environment by utilising triple glazing

[32] http://www.healthscotland.scot/media/1250/housing-and-health_nov2016_english.pdf
[33] https://www.scotpho.org.uk/life-circumstances/housing/data/housing-quality-and-overcrowding/

and additional levels of insulation that reduce noise pollution from outside with a consequential positive impact on the quality of life of occupants.

Reduced spend on fuel bills leaves tenants and residents with more income to spend on other things. This will have a positive knock-on impact on child poverty, food security and the affordability of housing costs.

Equalities

I believe my proposed bill would help reduce fuel poverty for tenants. The recent unprecedented rise in gas prices has resulted in a massive increase in the numbers of families who are experiencing fuel poverty; many of whom are making the choice between heating their home and feeding their families. Evidence points to fuel poverty and the impact of global warming impacting disproportionately upon the poorest and most economically disadvantaged. Building homes with significantly improved energy efficiency, higher levels of insulation, good quality design and certified building techniques will help with the affordability of fuel bills and improve the quality of life and well-being of tenants and homeowners.

An Equalities Impact Assessment (EQIA) has been carried out as part of policy development on the proposed bill. The EQIA assesses the impact of the bill's provisions, both positive and negative, on different protected characteristics under the Equality Act 2010.

As mentioned throughout this consultation, many people are finding themselves struggling to meet the increasing cost of living, and there are particular groups of society who will be suffering more than others. I consider that this proposal will have a positive impact on these people, for example, some members of the elderly population have struggled for too long to afford to heat their homes as well as meet other financial commitments[34]. I believe that by ensuring housing is built to a higher standard, it will provide a comfortably heated home at a much more affordable price for those members of the older population. The same would apply to those in the lower income brackets, for example single parents hit by any increase in cost of living, with many struggling to pay to heat their homes. The charity Gingerbread ran a survey which found that 98% of respondents said that they would have to cut back on household spending in order to meet the rising cost of living[35].

People with a disability or parents and carers of those with a disability also face particular hardship when it comes to meeting energy costs, with some needing to run lifesaving equipment which is powered by electricity such as ventilators. Typically

[34] "Long harsh winter" for older people as energy price hike bites (ageuk.org.uk)
[35] Gingerbread survey shows 'cost-of-living crisis' is forcing single parent families to go hungry to make ends meet - Gingerbread

disabled people have higher energy costs than most and are more likely to live in poverty[36].

Since the start of the pandemic in 2020, the majority of people in Scotland moved to working from home, which again had an impact on their energy costs, with the move to more people working from home and the start of 'hybrid' working many will continue to see a rise in their energy bills.

To sum up, I believe that the move to building more housing which must comply to meet a higher environmental standard would benefit the population as a whole and in particular those groups I have mentioned above. Not only would this benefit the population financially, but it would also future proof homes and prevent them from having to be retrofitted in the near future

Internal markets

I would welcome views from those involved in the production and sale of goods used in the construction of homes across the UK on the impact of these proposals. I would also welcome views from all those involved in providing services in the construction of homes across the UK on the impact of these proposals, in particular the proposed accreditation and certification scheme. In addition, I would welcome views on the market effects of the introduction of these proposals.

Questions

About You

(Note: Information entered in this "About You" section may be published with your response (unless it is "not for publication"), except where indicated in **bold**.)

1. Are you responding as:
- an individual – in which case go to Q2A
- on behalf of an organisation? – in which case go to Q2B

2A. 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".)
- Politician (MSP/MP/peer/MEP/Councillor)
- Professional with experience in a relevant subject
- Academic with expertise in a relevant subject
- Member of the public

[36] Disabled people facing 'impossible choices to survive' in cost of living crisis | Disability | The Guardian

Optional: You may wish to explain briefly what expertise or experience you have that is relevant to the subject matter of the consultation:

2B. Please select the category which best describes your organisation:

- Public sector body (Scottish/UK Government or agency, local authority, NDPB)
- Commercial organisation (company, business)
- Representative organisation (trade union, professional association)
- Third sector (charitable, campaigning, social enterprise, voluntary, non- profit)
- Other (e.g. clubs, local groups, groups of individuals, etc.)

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).

3. Please choose one of the following:

- I am content for this response to be published and attributed to me or my organisation
- I would like this response to be published anonymously
- I would like this response to be considered, but not published ("not for publication")

If you have requested anonymity or asked for your response not to be published, please give a reason. **(Note: your reason will not be published.)**

4. Please provide your full name (or the name of your organisation if you are responding on behalf of an organisation). **(Note: The name will not be published if you have asked for the response to be anonymous or "not for publication".)**

Name:

Please provide 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. **(Note: We will not publish these contact details.)**

Contact details:

5. Data protection declaration

☐ I confirm that I have read and understood the privacy notice Privacy Notice to this consultation which explains how my personal data will be used.

If you are under 12 and making a submission, we will need to contact you to ask your parent or guardian to confirm to us that they are happy for you to send us your views.

☐ Please tick this box if you are under 12 years of age.

Your Views on the Proposal

Note: All answers to the questions in this section may be published (unless your response is “not for publication”).

Aim and approach

1. Which of the following best expresses your view of the proposed Bill? **(please note that this question is compulsory)**

☐ Fully supportive
☐ Partially supportive
☐ Neutral (neither support nor oppose)
☐ Partially opposed
☐ Fully opposed
☐ Do not wish to express a view

Please explain the reasons for your response.

2. 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.

3. 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
- Partially supportive
- Neutral (neither support nor oppose)
- Partially opposed
- Fully opposed
- Unsure

Please explain the reasons for your response.

4. 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
- Partially supportive
- Neutral (neither support nor oppose)
- Partially opposed
- Fully opposed
- Unsure

Please explain the reasons for your response.

5. 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 above)

- Fully supportive
- Partially supportive
- Neutral (neither support nor oppose)
- Partially opposed

- Fully opposed
- Unsure

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.

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

Financial implications

7. Any new law can have a financial impact that would affect individuals, businesses, the public sector, or others. What financial impact do you think this proposal could have if it became law?

- a significant increase in costs
- some increase in costs
- no overall change in costs
- some reduction in costs
- a significant reduction in costs
- don't know

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.

Equalities

8. 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.

Sustainability

9. 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?

General

10. 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)?

How to Respond to the Consultation

You are invited to respond to this consultation by answering the questions in the consultation and by adding any other comments that you consider appropriate.

Format of Responses

You are encouraged to submit your response via an online survey (Smart Survey) if possible, as this is quicker and more efficient both for you and the Parliament. However, if you do not have online access, or prefer not to use Smart Survey, you may also respond by e-mail or in hard copy.

Online survey

To respond via the online survey, please follow this link:
https://www.smartsurvey.co.uk/s/BuildingStandards/

The platform for the online survey is Smart Survey, a third-party online survey system enabling the SPCB to collect responses to MSP consultations. Smart Survey is based in the UK and is subject to the requirements of the General Data Protection Regulation (GDPR) and any other applicable data protection legislation. Any information you send in response to this consultation (including personal data) will be seen by the MSP progressing the Bill and by staff in NGBU.

Further information on the handling of your data can be found in the Privacy Notice, which is available either via the Smart Survey link above or here: Privacy Notice.

Smart Survey's privacy policy is available here:
https://www.smartsurvey.co.uk/privacy-policy

Electronic or hard copy submissions

Responses not made via Smart Survey should, if possible, be prepared electronically (preferably in MS Word). Please keep the formatting of this document to a minimum. Please send the document by e-mail (as an attachment, rather than in the body of the e-mail) to:

alex.rowley.msp@parliament.scot

Responses prepared in hard copy should either be scanned and sent as an attachment to the above e-mail address or sent by post to:

Alex Rowley MSP
Room M1.04
Scottish Parliament
Edinburgh EH99 1SP

Responses submitted by e-mail or hard copy may be entered into Smart Survey by my office or by NGBU.

If submitting a response by e-mail or hard copy, please include written confirmation that you have read and understood the Privacy Notice (set out below).

You may also contact my office by telephone on (0131) 348 6827

Deadline for Responses

All responses should be received no later than 27 July 2022. Please let me know in advance of this deadline if you anticipate difficulties meeting it. Responses received after the consultation has closed will not be included in any summary of responses that is prepared.

How Responses Are Handled

To help inform debate on the matters covered by this consultation and in the interests of openness, please be aware that I would normally expect to publish all responses received (other than "not for publication" responses) on my website https://www.alexrowley.org

Published responses (other than anonymous responses) will include the name of the respondent, but other personal data sent with the response (including signatures, addresses and contact details) will not be published.

Where responses include content considered to be offensive, defamatory or irrelevant, my office may contact you to agree changes to the content or may edit the content itself and publish a redacted version.

Copies of all responses will be provided to the Scottish Parliament's Non-Government Bills Unit (NGBU), so it can prepare a summary that I may then lodge with a final proposal (the next stage in the process of securing the right to introduce a Member's Bill). The Privacy Notice explains more about how the Parliament will handle your response.

If I lodge a final proposal, I will be obliged to provide copies of responses (other than "not for publication" responses) to the Scottish Parliament's Information Centre (SPICe). SPICe may make responses available to MSPs or staff on request.

Requests for Anonymity or for Responses Not to be Published

If you wish your response to be treated as anonymous or "not for publication", please indicate this clearly. The Privacy Notice explains how such responses will be handled.

Other Exceptions to Publication

Where a large number of submissions are received, particularly if they are in very similar terms, it may not be practical or appropriate to publish them all individually. One option may be to publish the text only once, together with a list of the names of those making that response.

There may also be legal reasons for not publishing some or all of a response – for example, if it contains irrelevant, offensive or defamatory content. If I think your response contains such content, it may be returned to you with an invitation to provide a justification for the content or to edit or remove it. Alternatively, I may publish it with the content edited or removed, or I may disregard the response and destroy it.

Data Protection

As an MSP, I must comply with the requirements of the General Data Protection Regulation (GDPR) and other data protection legislation which places certain obligations on me when I process personal data. As stated above, I will normally publish your response in full, together with your name, unless you request anonymity or ask for it not to be published. I will not publish your signature or personal contact information. The Privacy Notice sets out in more detail what this means.

I may also edit any part of your response which I think could identify a third party, unless that person has provided consent for me to publish it. If you wish me to publish information that could identify a third party, you should obtain that person's consent in writing and include it with your submission.

If you consider that your response may raise any other issues under the GDPR or other data protection legislation and wish to discuss this further, please contact me before you submit your response. Further information about data protection can be found at: www.ico.gov.uk.

Freedom of Information (Scotland) Act 2002

As indicated above, NGBU may have access to information included in, or provided with, your response that I would not normally publish (such as confidential content, or your contact details). Any such information held by the Parliament is subject to the requirements of the FOISA. So if the information is requested by third parties the Scottish Parliament must consider the request and may have to provide the information unless the information falls within one of the exemptions set out in the Act. I cannot therefore guarantee that any such information you send me will not be made public should it be requested under FOISA.

Further information about Freedom of Information can be found at:

www.itspublicknowledge.info.

Appendix - FAQs

What is the proposed bill about?

This bill will legislate for the introduction of the Passivhaus Standard or a Scottish equivalent for all new build housing only in Scotland. The bill does not seek to legislate for the retrofitting of existing homes.

Why is this bill needed?

Energy prices are soaring with bills for many families more than doubling in just a few years. Fuel poverty in Scotland is at 25% of households. People are choosing between heating and eating. The direction of travel is to move to electric heating sourced from renewable sources but this is a more expensive form of energy and there is insufficient capacity to meet demand. Therefore, we need to use less energy.

At the same time we have a climate crisis and Scotland is failing to meet its climate targets. We need to reduce our energy consumption and emissions.

What is a Passivhaus?

A Passivhaus building provides significantly improved comfort and indoor air quality, as well as much lower energy bills. They are built with attention to detail and to rigorous design and construction principles that eradicate draughts retaining heat, lowering energy demand.

What are the main features of a Passivhaus home?

A Passivhaus has the following main features

- A high level of insulation
- Is draught free
- Has minimal thermal bridging
- Optimises passive solar gain
- Has mechanical ventilation often combined with heat recovery

These features combine to make the building comfortable to live in and very energy efficient.

Why do we need this change?

A combination of issues drive the need for this proposed bill

- Increased energy prices are pushing more households into fuel poverty
- The UN has declared a ‘code red’ for humanity in relation to the climate emergency

- Scotland has missed its climate targets - we need action across all sectors to address the climate emergency and housing must play its part. This bill will help Scotland meets its international climate obligations
- There is a need to eliminate the performance gap of up to 60% between what is claimed as the energy performance of a home against the actual performance.

How will adopting Passivhaus standards or a Scottish equivalent help?

Scotland has the highest level of fuel poverty in the UK. 25% of Scots are living in fuel poverty. Adopting Passivhaus or equivalent standards will reduce the energy demand for heating by up to 90% (compared to existing housing stock)

Passivhaus construction makes homes very fuel efficient and reduces the demand for energy.

The Scottish Government is already consulting on new building standards that will see all new build homes built to energy rating C, does this not mean there is no need to introduce this bill?

No, the Scottish government's plans rely on expensive electric heating replacing gas fuelled boilers. Electric heating increases demand on the grid and will continue to produce CO2 emissions. A Passivhaus or equivalent standard is achieved without the use of energy.

Will building to the Passivhaus or equivalent standard increase the cost of new build homes?

The estimated additional capital cost of building to the standard is estimated to be between 4%-8% of the total build. However,vastly improved energy efficiency will result in savings on heating bills and reduced emissions. The initial additional outlay will be repaid over time.

Builders report that moving from small or one off projects to building Passivhaus at scale will see the cost difference narrow. If these homes have to be retrofitted at a future date then the cost of doing so will be far greater than if it is done during initial construction. There is also financial savings for society as there will be lower CO2 emissions.

Do we have the skills to build to the Passivhaus standards or equivalent?

House builders who have moved from traditional construction methods to Passivhaus standards have invested in upskilling their workforce. They talk very

positively about how this has increased the pride architects and tradespeople take in their work and improves skills. Reports from companies in Ireland and Scotland who have taken this approach have been very positive. The changes required are described as tweaks to existing methods and a change of mindset.

Is there public support for this?

The Scottish Climate Assembly which is a representative group of the Scottish people voted by 97% to adopt the Passivhaus standard or a Scottish equivalent. This shows there is public support for the approach taken.