Proposed Domestic Building Environmental Standards (Scotland) Bill – Alex Rowley MSP

Summary of Consultation Responses

This document summarises and analyses the responses to a consultation exercise carried out on the above proposal.

The background to the proposal is set out in section 1, while section 2 gives an overview of the results. A detailed analysis of the responses to the consultation questions is given in section 3. These three sections have been prepared by the Scottish Parliament's Non-Government Bills Unit (NGBU). Section 4 has been prepared by Alex Rowley MSP and includes his commentary on the results of the consultation.

Where respondents have requested that certain information be treated as "not for publication", or that the response remain anonymous, these requests have been respected in this summary.

In some places, the summary includes quantitative data about responses, including numbers and proportions of respondents who have indicated support for, or opposition to, the proposal (or particular aspects of it). In interpreting this data, it should be borne in mind that respondents are self-selecting and it should not be assumed that their individual or collective views are representative of wider stakeholder or public opinion. The principal aim of the document is to identify the main points made by respondents, giving weight in particular to those supported by arguments and evidence and those from respondents with relevant experience and expertise. A consultation is not an opinion poll, and the best arguments may not be those that obtain majority support.

Copies of the individual responses are available on the following website https://www.alexrowley.org/billconsultationresponses/. Responses have been numbered for ease of reference, and the relevant number is included prior to the name of the respondent.

A list of respondents is set out in the Annexe.

Section 1: Introduction and Background

Alex Rowley's draft proposal, lodged on 3 May 2022, is for a Bill to:

> introduce new minimum environmental design standards for all new-build housing to meet the Passivhaus standard, or a Scottish equivalent, in order to improve energy efficiency and thermal performance.

The proposal was accompanied by a consultation document, prepared with the assistance of NGBU. This document was published on the Parliament's website, from where it remains accessible:
Proposed Domestic Building Environmental Standards Scotland Bill | Scottish Parliament Website

The consultation period ran from 4 May 2022 to 27 July 2022.

The consultation exercise was run by Alex Rowley's parliamentary office.

Alex Rowley engaged in a number of methods to publicise the consultation. His office regularly ran social media posts with the aims of the bill and the details of the consultation, averaging three posts per week throughout the consultation period on both Facebook and Twitter. The majority of these took the form of graphics with text, with the initial post including the video filmed by the NGBU team and one of the final posts including a video taken on location at a Passivhaus site.

The member's office also made contact with a number of people with interests in aspects of the bill. This included: a number of community councils; every councillor in Scotland; political party branches; trade unions; a number of companies and organisations representing or involved in the housebuilding industry, including the Federation of Master Builders and the Glass and Glazing Federation as well as architects and designers; the Passivhaus Trust which helped the member in developing the consultation paper; a number of environmental groups; a number of energy action groups; a number of charities engaged in work involving poverty or vulnerable people; and housing associations.

The member also wrote and published articles and press releases for: regional and national newspapers; building industry magazines and websites; and political publications.

The member also took part in a recorded conversation/podcast with Brodies LLP as part of its Housebuilding Conversations series.

The consultation process is part of the procedure that MSPs must follow in order to obtain the right to introduce a Member's Bill. Further information about the procedure can be found in the Parliament's standing orders (see Rule 9.14) and in the *Guidance on Public Bills*, both of which are available on the Parliament's website:

- Standing orders (Chapter 9): Standing Orders | Scottish Parliament Website
- Guidance (Part 3): Part 3: Stages of Bills – special cases | Scottish Parliament Website

Section 2: Overview of Responses

In total, 629 responses were received. Seventy-eight were from organisations and 551 were from individuals.

The responses can be categorised as follows (as with all percentages in this document these are rounded up or down to the nearest whole number):

- 2% from representative organisations [e.g. business association, trade union, political party or other body with a role representing its members or supporters' views collectively]
- 2% from public sector organisations [e.g. Scottish/UK Government, Govt agency, local authority, NDPB]
- 4% from private sector organisations [e.g. individual company or business]
- 4% from third sector organisations [eg charitable, campaigning, social enterprise, voluntary, non-profit organisations]
- 1% from other organisations [e.g. clubs, local groups, groups of individuals, etc.]
- 9% from individual politicians [MSPs, MPs, peers, councillors]
- 22% from professionals with experience in a relevant subject
- 3% from academics with expertise in a relevant subject
- 52% from private individuals (members of the public)

There were also:

- 136 (22%) anonymous submissions; and
- 58 (9%) of submissions that are "not for publication".

The majority of all responses (over 90%) were supportive of the proposal. Of the 78 organisations that responded, 82% were supportive of the proposal and 17% were opposed. More detail on those statistics and the overarching reasons for supporting or opposing the proposed Bill are given on page 5 (under Section 3, Question 1).

Disclaimer

Note that the inclusion of a claim or argument made by a respondent in this summary should not be interpreted as verification of the claim or as endorsement of the argument by the Non-Government Bills Unit.

Section 3: Responses to Consultation Questions

This section sets out an overview of responses to each question in the consultation document.

General aim of proposed Bill

Page 9 of the consultation document outlined the aim of the proposed Bill and what it would involve. Respondents were asked:

Question 1: Which of the following best expresses your view of the proposed Bill (Fully supportive / Partially supportive / etc.)? Please explain the reasons for your response.

Six hundred and twenty-nine respondents (100% of the total) answered this question.

Of those responses :

- A significant majority of respondents (93%) supported the proposed Bill (80% were fully supportive; 13% were partially supportive). A relatively small number (6%) were opposed in principle, but some who were supportive questioned whether the Bill proposal went far enough;
- 82% of organisations supported the proposed Bill, while 17% opposed it and 1% did not wish to express a view.

The main reasons given for supporting the proposed Bill were:

- it will reduce carbon and therefore make a contribution towards meeting net zero targets;
- it will have a positive impact on reducing energy bills and fuel poverty due to the energy efficiency of buildings built;
- it will avoid having to retrofit new build homes in future years.

The main reasons given for opposing the proposed Bill were:

- existing building standards are sufficient to ensure high levels of energy efficiency and meet net zero targets;
- there is a lack of human resource and expertise available in Scotland to implement a standard equivalent to Passivhaus for new builds;
- building to a Passivhaus or equivalent standard would require significant financial investment at the outset.

Other points mentioned were:

- a number of respondents (who were generally supportive of the proposal) argued that it should also require existing buildings to be retrofitted to Passivhaus standards;
- a number of respondents argued that the proposal should account for there will be geographical disparities, in so far as building a property to Passivhaus standards in urban areas may be more straightforward (and cost effective) than building one in rural areas. Some respondents

highlighted the need for policy development on the Bill to be accompanied by an islands impact assessment under the Islands (Scotland) Act 2018;
- a number of respondents highlighted that, if the bill were to provide for the adoption of a formal Passivhaus standard (rather than a Scottish building standard equivalent to the Passivhaus level) then independent international verification would be required;
- a number of respondents argued that would be benefits to people's health from building to a Passivhaus or equivalent standard.

Reasons for supporting the proposed Bill

As indicated already, levels of support for the Bill proposal were high, both among organisations and individuals. A number of respondents who were fully supportive made this clear in general comments they made in relation to this question.

In broad terms, responses tended to be supportive of the Bill proposal for the following three reasons:

- the proposal will help to **meet net zero targets**;
- the proposal will help to **address fuel poverty**;
- the proposal will help to **avoid future retrofitting of houses**.

Another reason given for supporting the proposal given in response to a number of questions was that building to Passivhaus or equivalent standard for new build homes would bring considerable health benefits to people living in such homes. This issue is covered throughout this document and in particular in the section covering Question 9 (the sustainability question).

Meeting Net zero targets

The contribution that this Bill proposal, if enacted, would make towards meeting net zero climate change targets through reducing the use of carbon in new build homes was highlighted by a significant number of respondents as being a reason for supporting it. Some of these responses are highlighted below.

For example, WARM Low Energy Building Practice was fully supportive of the proposal, stating:

> "This sort of leadership and action is what is required to tackle energy poverty and the climate crisis. It will encourage other regions to follow suit by proving what is possible." (Org_60, WARM Low Energy Building Practice, 1963929612).

Stop Climate Chaos Scotland supported the Bill proposal as "one measure that contributes towards the 'stretching pathway'"[1], noting that:

> "The Bill appears to propose the very highest standards of energy efficiency. This would be a welcome additional measure to efforts to decarbonise the buildings sector – and appears to be more ambitious than the current proposals for new Buildings Regulations from the Scottish Government" (NSS_004, Stop Climate Chaos Scotland).

The Edinburgh Architectural Association was also fully supportive of the proposal, describing it as a "positive approach" to improving environmental performance of new domestic buildings, adding that:

> "The Bill will also support the ambitions of Scottish Local Authorities such as the Edinburgh City Council to deliver low energy housing and their net zero carbon targets of 2030" (ORG_021, Edinburgh Architectural Association, 195990935).

Pure Haus ltd, argued that:

> "Climate change targets will be missed without making Passivhaus standards mandatory" (ORG_072, Pure Haus ltd,192517823).

The Perth and Kinross Branch of Scottish Green Party was fully supportive of the proposal, indicating that developers would not commit to more energy efficient standards without legislation:

> "This bill is crucial. In many instances in our area we have commented on planning applications, asking for solar panels, heat pumps, better insulation. The response from Council Officers is that they can't 'force' developers to do this as [there is] no legislation, and the developers won't do it without" (ORG_044, Perth & Kinross Branch of Scottish Green Party, 191304986).

Buidheann Tigheadas Loch Aillse Agus An Eilein Sgitheanaich (Lochalsh and Skye Housing Association) added:

> "The climate emergency needs significant and meaningful action and this is one aspect of housing quality we have direct control over" (ORG_009, Buidheann Tigheadas Loch Aillse Agus An Eilein Sgitheanaich (Lochalsh & Skye Housing Association), 191612249).

Dyce and Stoneywood Community Council stated that energy efficient new buildings are:

[1] the "stretching pathway" is a pathway for reducing emissions from buildings that is discussed in more detail in the Climate Change Committee's 2021 report to the Scottish Parliament under Section 9(1) of the Climate Change (Scotland) Act 2009. That report is available at: Progress-reducing-emissions-in-Scotland-2021-Report-to-Parliament-1.pdf (theccc.org.uk).

> “an obvious and effective way to reduce emissions and mitigate the effects of climate change” (ORG_020, Dyce and Stoneywood Community Council,192478755).

Passivhaus designer and engineer Alex Melichar was fully supportive of the proposal, stating:

> “Passivehouse level standards are the right way for domestic housing if we are treating the climate emergency properly. I do wish the bill spoke to the retrofit challenge by setting up a framework to progress this but its an excellent start” (IND_012, Alex Melichar, 190650986).

Similarly, self-builder Michael Hannay commented that:

> “Introducing PassivHaus standards to new builds will address the climate emergency, fuel poverty and improve residents health” (IND_250, Michael Hannay, 190670859).

Another self-builder, Mick Wooley, added:

> “Passivhaus is already available, tested and proven, over 30 years, as an excellent route to deliver high quality, comfortable and low energy housing. It is a recognised and well understood standard, so that getting components or labour from anywhere in the world is possible. It really is not that difficult: I can confirm that: as a first time PH self-builder I produced the most airtight house in UK” (IND_255, Mick Woolley, 191095994).

Zero Waste Scotland was partially supportive of the proposal, describing Passivhaus as:

> “a well-tested and robust methodology utilized across the world to deliver low operational carbon performing homes. They have low running costs, and the active ventilation ensures good air quality leading to economic and health benefits for the householder” (NSS_006, Zero Waste Scotland).

This issue is covered in more detail under question 4, which specifically asked about whether the Bill proposal was the most appropriate building standard to reduce emissions.

Addressing Fuel Poverty

A further argument advanced by a large number of respondents who were in favour of the Bill proposal was that it would help address fuel poverty. Below are extracts from some of those responses.

This argument was advanced by Fife Communities Climate Action Network CIC, which stated:

> "Raising energy efficiency standards for homes is the most economic and climate friendly approach to eradicating future fuel poverty" (ORG_023, Fife Communities Climate Action Network CIC, 192429660).

The Bakers, Food and Allied Workers Union was fully supportive of the Bill proposal due to its concern that:

> "Fuel poverty in Scotland is getting worse, we must take action to ensure that when new houses are built in the future fuel poverty is eliminated" (ORG_007, Bakers, Food and Allied Workers Union, 196003031).

A similar argument was advanced by Monica Lennon MSP:

> "Fuel poverty in Scotland continues to worsen and immediate action must be taken to ensure that new houses built will eliminate fuel poverty for individuals and families in the future, and provide sustainable homes for years to come" (IND_259, Monica Lennon, 195930565).

The trade union, USDAW, supported the requirement for new housing to be built to the Passivhaus standard, "as a long term measure to reduce workers' energy costs, without jeopardizing the building of more affordable housing" (NSS_005, USDAW).

Robert Parker described it as a "win win scenario - reduce demand for fuel and fuel poverty" (IND_299, Robert Parker, 192198096).

Mark Hunter drew attention to current energy prices. stating that they "have increased, and will likely continue to increase if measures that the bill will instigate are not put in place" (IND_229, Mark Hunter, 193563880), whilst Michael Hannay stated "Low energy homes are essential in addressing the climate emergency and ending fuel poverty" (IND_250, Michael Hannay, 190670859).

One individual, who wished to remain anonymous, stated:

> "Bad insulation in homes not only wastes energy but affects the poorest in society more due to expensive heating bills. These housing conditions it can also affect your health, two of my children suffered childhood asthma due to cold, drafty, and damp housing conditions which has led to ongoing health conditions into their adulthood. Therefore these housing conditions affect our use of the NHS" (IND_442, Anonymous, 194129472).

Achnacree Homes Ltd drew on its own experience to argue that the proposal would help address issues of fuel poverty:

> "The houses being constructed on our site near Oban have a very high insulation component thus minimising the amount of electric required to heat the house thus saving expense which is a huge incentive in the

> current climate of high energy costs" (ORG_001, Achnacree Homes Ltd, 192101463).

William Hay Walker drew on his own experience of fuel poverty to argue in favour of the Bill proposal:

> "I've experienced fuel poverty, this bill can go a long way to alleviate that by using energy efficient design insulation and construction" (IND_361, William Hay Walker, 190767686).

This issue is covered in more detail under question 3, which specifically asked about whether the Bill proposal was the most appropriate building standard to eradicate fuel poverty.

Retrofitting and energy efficiency of new build homes

A number of respondents who were supportive of the Bill proposal argued that the Bill was needed to ensure that new build houses do not require to be retrofitted in future years to become more energy efficient.

For example, White Hill Design Studio LLP stated:

> "we have passed the point where gradual improvements provide an adequate response to climate change. We should not be building homes which will require retrofitting in 10 years time to achieve zero carbon in use" (ORG_064, White Hill Design Studio LLP, 195697863).

Councillor Trish Robertson added that "We need to call a halt to retrofitting" (IND_067, Cllr Trish Robertson, 192222802), whilst David Jones took a similar view:

> "These standards will go a long way to help in the housing sector. New housing needs to be of the best standard. We should not be creating new house[s] that immediately need retrofitting!" (IND_090, David Jones,194702452).

Anthony Gillespie added:

> "Retrofitting is an expensive way to remediate on future energy needs. Proper standards for new builds will ensure we have used current knowledge to prevent future costs" (IND_034, Anthony Gillespie, 194562090).

One respondent, who was fully supportive of the proposal but who wished to remain anonymous, was a recent first-time buyer of a new home and indicated that they had found it difficult to get information on the energy efficiency of potential properties, adding that:

> "finding properties that were set up to age well in terms of carbon impact (so non-gas heating and MHVR, as well as efficient insulation

and glazing) was difficult. I was concerned that most new build properties would require retrofits as new regulations came into force that were foreseeable even now (e.g. removal of gas heating). Having all new build properties set to a standard that would mitigate a lot of likely climate-related regulation changes, that could certify the as-constructed performance of the property accurately, would have helped with this" (IND_398, Anonymous, 192384493).

Limitations of the proposal

Some respondents who were supportive of the proposal considered that it was "long overdue" and could go further. This was an argument advanced by Neil Stewart (IND_263, Neil Stewart, 194433483), whilst Tony Johnson stated that it was "not before time" (IND_354, Tony Johnson, 194114619) and another anonymous respondent argued:

> "Government should have been on this road 10 years ago. Why limit it to domestic buildings. Perth and Kinross already have a Primary school and a Secondary school being built to PH standards". (IND_377, Anonymous, 191266559)

Scone & District Community Council stated:

> "We are really concerned that no legislation has been passed to ensure developers must build more sustainably. The current legislation is not enough. When we discuss solar panels, heat pumps, active travel with Council officers they say it's not law and they can't insist. Recent build of 100 houses had token 4 with solar panels, and no heat pumps. Further they just mass fell the trees instead of trying to build round some giving immediate green space to new house owners" (ORG_048, Scone & District Community Council, 191304008).

Climate Action Strathaven indicated that it had been campaigning for such standards for a number of years:

> "We have been lobbying our local…council and national officials along the very lines of this report both as an organisation (since 2019) and as individuals for many years" (ORG_012, Climate Action Strathaven, 193259269).

Other respondents who were supportive of the proposal but who considered that there were limitations to the proposal took this view for other reasons.

For example, despite being partially supportive of the proposal, Zero Waste Scotland expressed the concern that:

> "there is one omission from the proposal - Net Zero or Net Zero Carbon as used in this proposal refers wholly to Net Zero operational carbon and makes no reference to embodied carbon of the materials. As embodied carbon is ~50% of the whole life carbon of a typical building,

> often more for a Passivhaus building due to the increased use of materials for airtightness and insulation, it is important to recognise and set targets for both operational and embodied carbon to meet Scottish Government Net Zero targets" (NSS_006, Zero Waste Scotland).

Reasons for opposing the proposed Bill

A small number of respondents were opposed to the proposed Bill (6% of all responses). This included opposition from organisations operating within the building industry. For example, Cala Group Ltd was fully opposed to the proposal (ORG_010, Cala Group Ltd., 196369784) and Barratt Developments PLC (NSS_002, Barratt Developments PLC) was partially opposed.

Reasons given for opposing the proposed Bill included:

- existing building standards are already sufficient to ensure improved energy efficiency of new builds;
- practical concerns about the lack of qualified human resource available to effectively implement Passivhaus in the construction sector;
- the additional costs that would be incurred if Passivhaus standards were required by statute.

Existing building standards are sufficient

A number of respondents that were opposed to the proposed Bill took the view that legislation was not required as making changes to improve the energy efficiency of new buildings should be done through existing building standards.

For example, David MacPherson, a professional with expertise in the area, stated:

> "The current Building Standards are sufficiently promoting energy efficiency and do not need further legislation or revision" (IND_091, David MacPherson, 194118072).

Homes for Scotland (fully opposed) advanced a similar argument:

> "In our opinion a new 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 is not required as the current direction of travel in Building Standards Improvement already addresses this" (ORG_030, Homes For Scotland, 196269820).

Hebridean Housing Partnership, which was partially opposed to the proposal, argued in favour of a slower and non-legislative move to adopting Passivhaus standards:

> "We are supportive of the principle behind the bill but feel it is a huge step to take at a time when costs are rising dramatically. It would make sense to increase design energy efficiency and improvement in construction standards through current building standards. Raise design level to 'Silver' rather than current Bronze and increase to Passivhaus 'Gold standard' over time" (ORG_026, Hebridean Housing Partnership, 193936577).

Peter Drummond, a chartered architect, was fully opposed to the proposal, arguing that:

> "The incorporation of a proprietary standard or system in legislation or associated regulatory instruments is inappropriate: the Scottish Government has no control over how that standard is prepared and implemented, nor do Passivehaus standards go through the same degree of public sector scrutiny as - for example - changes to the Building Regulations or Technical Handbooks" (IND_280, Peter Drummond, 195500699).

Iain Fraser added:

> "Minimum standards exist as building standards. Building to passivhaus only increases building costs and therefore fewer homes are built" (IND_158, Iain Fraser, 192276384).

Torphins Community Council was partially opposed to the proposal, but added that:

> "I hope you take the time to consult with the various professional bodies, institutions, and our own building standards who appear to all be working in the same direction and could probably benefit from an interested MSP willing to work with them" (ORG_056, Torphins Community Council, 192695972).

The issue of whether changes to existing building standards would be an alternative to legislation in this area is discussed under question 2.

Lack of qualified human resource available to implement Passivhaus

A further argument made by respondents opposing the Bill proposal was that there is a lack of human resource or skillset available in Scotland to fully implement the Passivhaus standard in all new build houses.

For example, Barratt Developments PLC, whilst acknowledging that energy efficiency enhancements will assist in achieving zero carbon, was partially opposed to the proposal on the grounds that a:

> "requirement for the design to meet Passivhaus standards or a Scottish standards equivalent…is a big step change for the industry, not just in

> the way that we build, but the way our homes look and our customers use them" (NSS_002, Barratt Developments PLC).

Cala Group Ltd added that:

> "Industry needs time to make the step change and upskill to be ready for such drastic change" (ORG_010, Cala Group Ltd.).

Leslie Milne, an individual with over 40-years' experience as a housing professional, was partially opposed to the proposal, arguing that a lack of trained human resource would be an issue if the Bill were to be enacted:

> "Passivhaus requires very accurate measurement, specific materials which are not currently capable of being delivered by supply chains. The cost of materials is high and rising and strict supervision of contractors will be required. There simply are not enough suitably trained qualified clerks of work at the moment, and several years of additional trades development and proper apprenticeships would need to be funded before clients could confidently expect the necessary standards of workmanship to be achieved" (IND_210, Leslie Milne, 195729886).

North Lanarkshire Council expressed concern that the proposal would cause:

> "delayed development due to short to medium term supply chain availability (resources and labour)" (ORG_041, North Lanarkshire Council, 196393539).

Additional costs incurred by adoption of Passivhaus standard

Some responses indicated that there would be additional costs incurred by requiring new build buildings to be built to Passivhaus standards. For example, an individual, who had experience working in the affordable rented housing sector, and who wished to remain anonymous, was fully opposed to the proposal for the following reasons:

> "While Passivhaus may be appropriate in some, it will not be appropriate to all build circumstances when examining location, aspect situation. Cost of Passivhaus exceeds other construction design standards and would cause either (or all) increased development costs, reduced provision of units nationally (due to cost), greater demand for grant assistance, extended time required to achieve national targets, technical issues for production and delivery due to lack of skills, expertise and resources both in design and construction delivery" (IND_384, Anonymous, 191850406).

Rural Design Ltd was partially opposed to the proposal, expressing concern that it would lead to an increase in construction costs, adding that:

> "Any further increase in standards and (and therefore building costs) need to be assessed against housing affordability, including the remote parts of Scotland with a true assessment of real world build costs" (ORG_047, Rural Design Ltd, 192344817).

There is further discussion on the cost implications of Passivhaus in the section on the financial implications of the proposal below (Question 7).

Other points made

A number of other points were made in comments by respondents opposed to the proposal. For example (emphasis added):

Torphins Community Council, which was partially opposed to the proposal, argued against a one size fits all approach in requiring new builds across the country to comply with Passivhaus standards, stating:

> "The issue of a one size fits all scheme is that it disproportionally affects those less well-off and also people in more rural or remote areas. **A Passive Haus in the central belt looks very different to a Passive Haus in the north of Scotland** as the embodied and operational carbon required to keep it as warm is greater" (ORG_056, Torphins Community Council, 192695972).

North Lanarkshire Council was fully opposed to the proposal, but made clear that it was not opposed to the Passivhaus model in itself, which should be "an **available option to be utilised** where and when it is deemed the most appropriate approach **rather than a single limiting standard**" (ORG_041, North Lanarkshire Council, 196393539).

Donaldson Timber Systems Ltd was partially opposed to the proposal, but caveated its response by indicating that it might be be supportive of a Scottish equivalent to Passivhaus, rather than Passivhaus itself, **if it were to be defined in collaboration with industry**:

> "There is reference in the consultation to a "Scottish equivalent" to Passivhaus, and this in principle is supported**. Industry has to be involved in the definition of this Scottish equivalent standard**, based on high volume projects previously completed with excellent thermal performance, not least the Commonwealth Games Village, Fife Demonstrator Project, Highland Innovation Expo and AimC4" (ORG_018, Donaldson Timber Systems Limited, 196433966).

Former architect and domestic energy advisor, Sean Watters, was also fully opposed to the proposal, arguing that creating a statutory Passivhaus standard would be "unnecessarily burdensome as a requirement for all new housing". In relation to meeting net zero targets, he stated that:

> "the proposed bill **simply won't contribute much to achieving net zero**. You could build Passivhaus homes for the next 30 years and the effect on domestic carbon emissions would be marginal. The rate at

> which we replace our building stock is so low, that we can't possibly build our way to net zero. **We need to refurbish our way to net zero. Passivhaus for new builds is a distraction** from the radical work we need to do to our existing housing stock" (IND_323, Sean Watters, 192236641).

One former local authority housing professional also challenged the argument that introducing a Passivhaus standard would prevent the need for retrofitting in future:

> "There is also no link whatsoever between retrofitting existing housing stock and a new build passivhaus standard. None of the properties being developed currently will need insulation upgrades over their lifetime. Many will have new zero carbon heating and renewable generation and battery storage fitted at some point in the future, but that would also be the case for Passivhaus properties" (IND_367, Anonymous, 190632262).

Question 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.

Five hundred and ninety-seven respondents (95% of the total) answered this question. The majority of those responses indicated that they considered that legislation was required. Equally, as indicated above in relation to question 1, a number of respondents did not consider that legislation was required, taking the view that greater energy efficiency in new build houses could be achieved using existing building regulations.

Legislation is required

The following comments were made by respondents which took the view that legislation was required:

For example, Unite the Union Scotland stated that "we do not see how these proposals would be achieved without legislation" (ORG_059, Unite the Union Scotland, 196401286) whilst Architects Climate Action Network Scotland added that:

> "Legislation is required, mandatory even. While the Technical Standards could be used to introduce this level of performance, they have failed to do so. The inertia of the construction industry has hindered progress" (ORG_003, Architects Climate Action Network Scotland, 196443628).

The Highlands and Islands Green Party argued that:

> "Yes, legislation is needed. Bulk Housebuilders have no incentive to improve the design quality or build quality of the houses they build, as

> they can currently sell any poorly-designed and badly-built house. Existing building standards are weak and laxly enforced. Local authorities have few resources to monitor standards" (ORG_028, Highlands & Islands Green Party, 192564813).

Craigiebuckler and Seafield Community Council stated:

> "Legislation is required. Energy efficiency is vital and cannot be left to property developers to voluntarily build energy efficient homes. They are motivated by financial gains" (ORG_017, Craigiebuckler and Seafield Community Council, 192617137).

Bellyeoman Community Council argued that legislation was required, expressing concerns about the current system:

> "Legislation is required as the current system is failing to deliver the maximum environmental benefit. Home builders and home purchasers generally seem unwilling to invest in environmental mitigation measures unless forced to do so. Thus, legislation is inevitable if change is to be achieved. Legislation will also ensure a level playing field which will not disadvantage those first movers towards greater conservation measures" (ORG_008, Bellyeoman Community Council, 194173387).

Marchmont & Sciennes Community Council was also in favour of legislation:

> "The aims of the legislation is long overdue and we see how without this, builders will inevitably cut corners. What is also required is legislation and support for upgrading the rest of our housing stock" ORG_037, Marchmont & Sciennes Community Council, 194216187).

Loreburn Housing Association took the view that:

> "Until legislation is put in place that certifies a certain standard, contractors (and other landlords) will build to existing building regulation standards" (ORG_035, Loreburn Housing Association, 194623779).

The need for legislation to enforce new building standards was made by a number of other respondents. For example, the Energy Saving Trust added that "It is unlikely that the aims of the proposed Bill could be achieved without legislation in place" (ORG_022, Energy Saving Trust, 196146484) whilst Constructive Individuals Ltd stated that "Mainstream builders won't do it otherwise and the standard will then linger on the sidelines of the industry" (ORG_016, Constructive Individuals Ltd, 196399757) and Bob Shaw, a former community development organisation chair, argued that "Legislation is required. Market forces will not respond adequately" (IND_042, Bob Shaw, 194101798).

The Edinburgh Architectural Association added that:

> "Legislation is the most effective method of achieving climate change targets and to reduce carbon emissions. The market will always aim to deliver to the minimum standard for their default product…Additionally, legislation should assist the Local Authorities in Scotland to deliver their 2030 net zero targets and their ambitions to provide low energy housing for all tenure types" (ORG_021, Edinburgh Architectural Association, 195990935).

Legislation is not required

Whilst the majority of responses to this question considered that legislation was required, a number of responses, including from organisations operating in the industry, did not consider that legislation was required. The main reason given, was that existing building standards were the appropriate place for any changes to be made (see also comments on this matter under question 1).

For example, Cala Group Ltd made its position clear:

> "There is no requirement for this as additional legislation. The principles of this should be brought forward through changes to the Energy Standards and consulted on and mandated through Scottish Government Building Standards Division. Industry needs time to prepare and upskill for this step change at a suitable timeframe" (ORG_010, Cala Group Ltd.,196369784).

Another organisation operating in the construction industry, Barratt Developments PLC, added:

> "We don't believe additional Legislation is required. As we do currently, changes in Standards should be consulted on and mandated through the Scottish Government Building Standards Division" (NSS_002, Barratt Developments PLC.).

North Lanarkshire Council stated that its reasoning for not considering that legislation was required was linked to its opposition to what it considered to be a "prescribed approach" of the Bill proposal:

> "Building Standards Technical Handbooks provide guidance in achieving standards set within the Building (Scotland) Regulations 2004. The technical handbooks are functional guidance, this proposal is more a prescribed approach, so a change of legislation may be required if a prescribed approach is sought. Given the view that a prescribed approach would be limiting to development proposals and has other consequences … then it is considered that any adjustment or amendment to performance standards should be sought via amendment of the Technical Handbooks and should be proposed within existing processes available to do so. It is not believed therefore that legislation is required to achieve the benefits sought" (ORG_041, North Lanarkshire Council, 196393539).

North Ayrshire Council took a similar view:

> "The Council does not agree that new legislation is required. The Bill's proposed aims could be achieved and enforced by the introduction of revised Building Standards" (ORG_040, North Ayrshire Council, 196410065).

The Association of Local Authority Chief Housing Officers (ALACHO), which was partially supportive of the Bill proposal, provided detail on why some of its members did not consider that legislation was required:

> "The view of ALACHO members is that legislation is not necessarily need as we can use Building Standards. Under Sustainability of the Building standards point 7.1.7 Carbon dioxide emissions only at Platinum level could be enhanced to deliver the desired outcomes without having to bring in a new Bill. In addition it is not always possible to create layouts that are both efficient to photovoltaics and Passivhaus methodology, whilst also increasing density on a site so there would be a reduction in homes built" (ORG_006, Association of Local Authority Chief Housing Officers (ALACHO), 196436725).

On this question, Zero Waste Scotland, which was also partially supportive of the Bill proposal, argued that the policy intent of the proposal could alternatively be achieved through existing building standards:

> "Building Standards Sections 6 and 7 have the ability to set challenging energy efficiency (operational carbon) and upfront carbon (embodied carbon) targets. We already see how challenging energy efficiency targets are driving the new schools programme towards the Passivhaus standard, with examples from Edinburgh (Currie High School) and East Ayrshire (St Sophia's Primary Schools). Setting challenging targets rather than requiring Passivhaus standard would give the industry flexibility in how it would deliver the quality of build required, but a mechanism of post occupancy evaluation would need to be written into the Building Standards to ensure full compliance with the target" (NSS_006, Zero Waste Scotland).

An individual with extensive experience in the house building industry and who wished to remain anonymous, was partially opposed to the proposal, arguing that, whilst the basic principle behind what the proposal is trying to achieve was not in doubt:

> "Thermal efficiency is already required through Building Regulations, however. There are also changes coming down the line, which will eliminate gas from new homes. New build standards already therefore achieve high levels of air tightness and insulation. Past a certain point, however, there are only marginal gains to be had, which need to be balanced with costs. Insisting on Passivehaus, which is an extreme, is likely to increase costs significantly for marginal gains" (IND_467, Anonymous, 195621809).

The argument that the draft proposal could be given effect to within the current system and without the need for legislation was one made by the Active House Alliance, which was partially supportive of the proposal (NSS_001, Active House).

It is worth noting that Building Standards are themselves forms of secondary legislation (made under the Building (Scotland) Act 2003). Therefore, where responses argue that legislation is not required as updates to building standards can be used instead, essentially what is being argued is that they do not consider that new **primary legislation** is required to require new build homes to be built to a standard equivalent to the Passivhaus standard.

Legislation must fit with existing building standards

Other respondents indicated that any new legislation must fit alongside existing building standards. For example, Noel Wright Architects Ltd stated:

> "I agree with the aim but this should not be separated from current systems that determine building standards, principally building regulations. Do not create layers of regulations that do not neccesarily 'fit together' properly and require multiple systems of control and enforcement" (ORG_039, Noel Wright Architects Ltd, 195347582).

South Lanarkshire Council added:

> "It may be appropriate for these new standards to be linked with the review of the design guide for Housing for Varying Needs Standards (HfVN). Currently, compliance with HfVN standards is enforced through the national Affordable Housing Supply Programme and there is no requirement on private aspects of the housing sector to fully comply with HfVN standards. Legislating both aspects will ensure that a coherent approach is attained and gaps between private and social housing are eliminated in relation to space and emissions standards" (ORG_051, South Lanarkshire Council, 195699628).

Elsewhere in its response (in response to Question 10), the council noted:

> "Whilst South Lanarkshire Council is partially supportive of the bill and recognises the positive impact this may have on climate change targets, the council would suggest it already builds new homes to a high energy efficiency standard (EPC Band B) that directly benefits the tenants within these and contributes towards emissions targets. Focus should perhaps therefore be on directing resources to improving standards within existing domestic buildings to help ensure the vast majority of its homes also benefit tenants and help reduce overall emissions from the domestic building sector".

RIAS, which was partially supportive of the proposal generally, considered that:

> "the existing Scottish legislative framework can be used to mandate the levels of fabric and ventilation performance, which are included within the Passivhaus Standard and many other similar UK and international voluntary systems, without the need to off-shore the Scottish regulatory system. Introducing the need to satisfy yet another external body (which is unaccountable to the Scottish Government) would only add to the current complexity where some local authorities have introduced their own localised standards through the planning system, but do not have a clear regulatory route by which applications can be assessed as part of their statutory duties. The RIAS supports a proposal to develop a flexible Scottish equivalent to the Passivhaus Standard" (ORG_054, The Royal Incorporation of Architects in Scotland (RIAS), 196277943).

RIAS also stated in its submission:

> "Whilst the RIAS recognize that the Passivhaus Standard, when fully applied, will deliver energy efficient buildings, we recognise that the application of some of these principles can already improve outcomes within the current regulatory system, and through improvements in the National Calculation Methodologies (NCMs) of SAP (Standard Assessment Procedures) and SBEM (Simplified Building Energy Modelling)".

Question 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 / etc.)? Please explain the reasons for your response.

Six hundred and twenty-five respondents (99% of the total) answered this question. Of these 91% supported setting the Passivhaus standard or a Scottish equivalent as the most appropriate new build housing standards to contribute to eradicating fuel poverty. Just under 5% were opposed, just under 2% were unsure whilst 3% took a neutral position. Of the organisations which responded to this question, 89% were supportive (62% fully supportive; 27% partially supportive).

Furthermore, as rehearsed above, a number of respondents to question 1 cited eradicating fuel poverty as being the reason they were supportive of the Bill proposal.

Supportive

The vast majority of respondents who were supportive of the view that setting the Passivhaus standard or a Scottish equivalent would constitute the most appropriate new build housing standards to contribute to eradicating fuel poverty were of the view that setting the Passivhaus standard would lead to lower energy bills for householders, thereby significantly alleviating fuel

poverty. Below is a selection of comments made by respondents who were supportive for this reason.

Helical Systems Ltd, which was fully supportive of the view that Passivhaus would contribute to eradicating fuel poverty, describing it as a “no-brainer” and argued that:

> “once people are healthy, comfortable, warm, the knock on effects are exponential socially and economically” (ORG_027, Helical Systems Ltd, 195353388).

WARM Low Energy Building Practice, which was fully supportive of the view that Passivhaus would contribute to eradicating fuel poverty, stated:

> “Passivhaus delivers significant energy savings that are actually realized in occupant’s bills and which address fuel poverty. This is because all three stages of a construction project are managed robustly, to ensure the building is (1) designed appropriately, (2) built to match the design and (3) commissioned correctly (e.g. air flow rates, temperature set points and so on) to match the design” (ORG_060, WARM Low Energy Building Practice, 196392961).

WARM added:

> “This ‘triple lock’ of designing the building right, building it right and commissioning it right ensures that the promised progress on fuel poverty is actually delivered”.

The Edinburgh Architectural Association was also fully supportive of the view that Passivhaus would contribute to eradicating fuel poverty, describing the Passivhaus standard as:

> “a tried and tested method of designing and constructing highly energy efficient buildings and therefore significantly reducing utility bills and the incidence of fuel poverty” (ORG_021, Edinburgh Architectural Association, 195990935).

Architect, Julie Wilson, stated:

> “As a designer of constructed passive houses I have witnessed first hand the benefits for the occupier in the form of low energy bills, a warm comfortable draft free home with good internal air quality” (IND_198, Julie Wilson, 192097920).

The UK Passivhaus Trust, which was also fully supportive, stated that the Passivhaus standard:

> “provides exceptional levels of interior comfort, health and wellbeing, affordability, resilience and durability. Making it is most appropriate standard to set when looking to eradicate fuel poverty” (ORG_058, UK Passivhaus Trust, 190893415).

Pure Haus Ltd (fully supportive) described the Passivhaus standard as being "tried and tested" in contributing to eradicating fuel poverty (ORG_072, Pure Haus ltd, 192517823), whilst the Highlands and Islands Green Party added "Passivhaus or equivalent by definition reduce energy use dramatically, and so will of course help end fuel poverty. Other standards will be too weak" (ORG_028, Highlands & Islands Green Party, 192564813).

Climate Action Stathaven (fully supportive) described Passivhaus as:

> "a fully verified and sensible method of working which brings the results that are required to keep everyone safe for the future as the reductions in energy use bring everyone's bills back to a liveable level" (ORG_012, Climate Action Strathaven, 193259269).

In expressing full support in relation to this question, the Energy Saving Trust highlighted the findings of the 2019 report by the Committee on Climate Change (CCC), UK housing: Fit for the future?, and the impact that it believes energy efficient buildings would have on energy bills:

> "The CCC's 2019 report … noted that when installed alongside heat pumps in a typical home, ultra-high levels of fabric efficiency can deliver average bill savings of around £85 per household per year. As you will be aware, energy prices have increased significantly since this report was published and as such the bill savings that ultra-high levels of fabric efficiency can delivery are now likely to be very much larger.
>
> It is also worth noting that the CCC found that ultra-high levels of energy efficiency (consistent with a space heat demand of 15 kWh/m2/yr) were generally more cost-effective than less ambitious energy efficiency standards (20-30 kWh/m2/yr of space heat demand). That's because highly insulated homes need a much smaller heating system. The CCC identified an up to c.£3,300 saving in the capital cost of the radiators and heating distribution system for the most energy efficient fabric specifications" (ORG_022, Energy Saving Trust, 196146484).

Loreburn Housing Association (fully supportive) explained how the Passivhaus model would lead to a reduction in fuel poverty in practice:

> "A Passivhaus guarantees a low heat demand from an energy supply. As the property controls the heat via the mechanical ventilation system and recycles warm there is little demand for heat to be generated in the property. With little heat demand it means the occupants of the property are not required to pay to heat their home" (ORG_035, Loreburn Housing Association, 194623779).

The Scottish Federation of Housing Associations (SFHA) was also partially supportive in relation to this question, but expressed some wider concerns around affordability for tenants:

> "For social landlords, decision making around the design of new housing developments needs to consider overall affordability for

> tenants. This not only includes fuel poverty considerations but also the impact which both the capital costs and ongoing management and maintenance costs will impact rents. While government grants contribute to capital costs, developments still require significant investment from our members funded through rental income. Even where private finance can be accessed, there are limits to how much an RSL can borrow and limits on how much extra tenants can afford to pay to fund this (and maintain over its lifecycle). So while a Passivhaus standard may help to minimise operational energy costs, there is a risk that the increased costs of building to this standard could jeopardise rent affordability" (ORG_050, Scottish Federation of Housing Associations, 196422990).

ALACHO, also partially supportive, expressed a concern that:

> "given the cost of living crisis households are facing with high energy costs we inadvertently push people further into fuel poverty through decarbonisation of heat sources for more expensive electric options" (ORG_006, Association of Local Authority Chief Housing Officers (ALACHO), 196436725).

ALACHO added that:

> "There also needs to be work done by the industry to educate people on how to live and benefit from a passivhaus home, the fact that homes are not hot but instead a continuous ambient heat will be alien to some people".

An organisation, which wished to remain anonymous, was partially supportive in relation to this question, on the basis of concerns that about delivery and building costs being passed on to tenants:

> "Fully supportive of the principle of the standard. [It is] the delivery/build cost which is the concern as this additional cost can't be passed on to tenants otherwise it will worsen fuel poverty" (ORG_065, Anonymous, 192386123).

Rockwool UK Ltd was also partially supportive, arguing that, in order to tackle fuel poverty, "more will need to be done across the existing housing stock to reach many of those living in fuel poverty in Scotland". Rockwool added that:

> "While data on the profile of residents of new build homes is not available, the Scottish Housing Survey shows that only 17% of those who do "not manage well" financially are owner occupiers or private renters . Meanwhile the Scottish Housing Statistics show that only 24.4% of new homes completed between October and December 2020 were built by Local Authorities or Housing Associations , with the remainder built for private use. Similarly in England we can see that 82% of those living in homes completed after 1990 are owner occupiers or private renters . So the impact on fuel poverty of adopting a Passivhaus standard is unlikely to be far-reaching unless it is

> expanded to retrofitted homes also" (ORG_046, ROCKWOOL UK Ltd, 195829282).

The issue of retrofitting existing stock was also raised in relation to this question from, for example, Homes for Scotland (partially supportive), North Ayrshire Council (partially supportive) and West Lothian Council (partially supportive) (ORG_030, Homes For Scotland, 196269820; ORG_040, North Ayrshire Council, 196410065; ORG_062, West Lothian Council, 196167607). Cala Group Ltd (also partially supportive on this question but fully opposed to the Bill generally) argued that the focus should instead be on upgrading existing housing stock to reduce its reliance on fossil fuels to heat (ORG_010, Cala Group Ltd, 196369784).

Barratt Developments PLC, which was partially opposed to the proposed Bill, indicated that it was partially supportive in relation to this question, stating that:

> "Focusing efforts on long-lived building fabric helps to 'future proof' homes meaning they will be less likely to require difficult and expensive refurbishment updates at a later date. This supports the parallel agendas of carbon reduction, long term energy security and reducing fuel poverty" (NSS_002, Barratt Developments PLC).

Nevertheless, Barratt had concerns that:

> "Lack of consumer knowledge and understanding on how to run a low carbon/Passivhaus home can lead to operating and running inefficiencies which can in turn impact the energy consumed and cost to the end user".

Local Authority Building Standards Scotland, which was partially supportive in relation to this question as well as on the more general question on the proposed Bill (question 1), caveated this support by expressing concerns that existing building standards may provide more design flexibility whilst still contributing to the eradication of fuel poverty:

> "While the Passivhaus standard (or Scottish equivalent) is recognised as a 'gold standard' level, it is the opinion of LABSS that minimum levels set within building regulations should be performance based and as such the use of a prescriptive code may not be appropriate or provide the necessary design flexibility permitted by the current performance-based approach, which includes aspects which seek to limit energy demand and contribute to eradicating fuel poverty" (ORG_034, Local Authority Building Standards Scotland (LABSS), 195984274).

Opposed

A small number of respondents (5%) indicated that they were opposed to the view that Passivhaus or Scottish equivalent would contribute to eradicating fuel poverty. Reasons given for being opposed were:

- “[Passivhaus is] Not commercially viable” (IND_366, Anonymous, 190583528, Fully opposed);

- “while a Passivhaus property is cheaper to run, it is more expensive to build” (IND_367, Anonymous, 190632262, Fully opposed; see also IND_285, Philippe Cortese, 195339869, Fully opposed);

- “[Passivhaus] adopts a flawed approach to energy efficiency which is far too expensive and produces little benefits over and above simpler solutions” (IND_113, Dr Tom Woolley, 190888772, Fully opposed);

- “Not clear that the strict behaviour needed for low or zero energy emissions will be adhered to by those living in the property” (IND_385, Anonymous, 192062378, Fully opposed);

- “If you want to eradicate fuel poverty through improvements to homes, the focus needs to be refurbishment” (IND_323, Sean Watters, 192236641, Partially opposed);

- “We should be more tactical about how this is tackled and renovate the lower value homes of pensioners, people on benefits and others in need of support” (IND_158, Iain Fraser, 192276384, Fully opposed);

- “Affordability for tenants and Housing Authorities will be a barrier.” (IND_396, Anonymous, 192330588, Fully opposed);

- “For new houses it means less houses because the capital available is restricted, and Passivhaus is expensive That means the poorer suffer because we cannot build enough houses” (IND_400, Anonymous, 192412919, Fully opposed);

- “too high a standard and too inflexible. Standards should be attainable and appropriate for Scotland. Not just lifted from Europe” (IND_428, Anonymous, 194108424, Partially opposed);

- “[it will affect] Only those fortunate enough to be let a Passivhaus property or those able to afford a privately owned new dwelling built to that standard. It won’t eradicate fuel poverty for tenants and owners in 95+% of the total Scottish housing stock” (IND_210, Leslie Milne, 195729886, Partially opposed).

Neutral/Unsure

Eighteen respondents took a neutral stance in relation to this question, whilst a further 11 were unsure. Reasons given for those positions from those who commented included:

- “new build housing alone will not significantly contribute to the eradication of fuel poverty, which will continue to be an ongoing

concern with existing housing stock" (IND_223, Marcus O'Connell, 192004899, Neutral);

- "Very very few people in fuel poverty would ever get access to a Passivhaus unless there is a great increase in the rate of building in the public sector. [However] If this envisaged then the results could be significant" (IND_192, John Palfreyman, 192165011, Neutral);

- "It won't stop fuel poverty until existing buildings have been retrofitted" (IND_446, Anonymous, 194143989, Neutral; see also IND_280, Peter Drummond, 195500699, Neutral);

- While constructing buildings to the Passivhaus standard will result in lower energy consumption, it does not necessarily mean lower fuel bills due to the difference between gas and electricity unit costs (IND_125, Euan Lochhead, 192568467, Neutral).

Some of those who ticked the "unsure" box indicated that they did so because they were unfamiliar with how Passivhaus would operate in practice (see, for example, responses from John McKnight (IND_189, John McKnight, 194114280) and Dyce and Stoneywood Community Council (ORG_020, Dyce and Stoneywood Community Council, 192478755).

Question 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 / etc.)?

Six hundred and sixteen respondents (98% of the total) answered this question.

Supportive

Over 91% of those who answered this question were supportive. Almost 79% were fully supportive, and just under 13% were partially supportive. Of the organisations that answered this question, 83% were supportive (59% fully supportive; 24% partially supportive).

A significant number of respondents who were supportive of the view that setting the Passivhaus standard would contribute to a reduction in emissions cited evidence that Passivhaus homes require low levels of heating due to the insulation they possess. This was an argument advanced by, for example, Fife Communities Climate Action Network CIC, which described Passivhaus homes as "well insulated and well sealed" (ORG_023, Fife Communities Climate Action Network CIC, 192429660).

In answer to this question, Climate Action Strathaven described the Passivhaus method as:

> “a fully verified and sensible method of working which brings the results that are required to keep everyone safe for the future because of the huge decrease in energy useage thus the huge reductions in CO2e” (ORG_012, Climate Action Strathaven, 193259269).

Simon Clark, Constructive Individuals Ltd added that:

> “We need to minimise energy usage to minimise emissions. Passivhaus standards best retain the heat that is produced” (ORG_016, Constructive Individuals Ltd, 196399757).

Architype Ltd, which was fully supportive, added that:

> “Adopting Passivhaus for new build housing is a really simple fix to reducing carbon emissions at source” (ORG_004, Architype Ltd, 196439702).

Architects Climate Action Network Scotland, which was also fully supportive, stated:

> “Passivhaus greatly reduces the fuel required to heat a building, this would reduce the amount of emissions produced” (ORG_003, Architects Climate Action Network Scotland, 196443628).

Paper Igloo Ltd (fully supportive) made the link between adopting the Passivhaus method and circular economy principles:

> “Often low energy buildings go hand in hand with reductions in emissions relating to embodied energy: the Passivhaus Standard is very compatible with sustainable building materials and systems, such as timber frame (already prevalent in Scotland) and natural fibre-based insulation materials, or wood-based board materials that can provide airtight and vapour control layers as well as a structural purpose within a construction. These materials and systems are also beneficial for the building occupant’s health and well-being by significantly reducing VOC’s and creating demountable construction that is compliant with circular economy principles” (ORG_043, Paper Igloo Ltd., 192400693).

RIAS was partially supportive, arguing that:

> “The electricity grid is decarbonising more quickly than it is appropriate to revise the Technical Standards. The RIAS therefore supports the move to regulate against energy and heat demand to ensure that fabric and service efficiencies are improved. A Scottish equivalent to the Passivhaus Standard, will contribute to achieving that” (ORG_054, The Royal Incorporation of Architects in Scotland (RIAS), 196277943).

North Ayrshire Council, which was partially supportive, stated that:

> “Setting the highest performance standards will eliminate the need to carry out future retrofit works which will likely be required to meet

national and local net zero targets" (ORG_040, North Ayrshire Council, 196410065).

South Lanarkshire Council indicated that it was:

> "partially supportive of introducing higher building standards that attract zero carbon emissions but suggest further consultation takes pace with relevant stakeholders to fully understand the impact adopting this approach would have" (ORG_051, South Lanarkshire Council, 195699628).

The Energy Saving Trust made a link between lower carbon emissions and the adoption of new standards such as Passivhaus:

> "The energy used within every new home (operational energy) that is built in Scotland together with the energy associated with the construction of every new home (embodied energy) adds to Scotland's overall CO2 emissions at a time when there is an urgent need to reduce emissions. As noted in our response to question 1 above energy efficiency is the most effective long-term guarantee of a housing stock that uses less energy and emits less carbon. For this reason we believe that setting standards for new homes that will deliver very high levels of energy efficiency (such as the Passivhaus standard) would make an important contribution to emissions reductions in Scotland" (ORG_022, Energy Saving Trust, 196146484).

In its response, West Lothian Council, which was partially supportive in relation to this question, commented on the levels of carbon emitted from a home built to Passivhaus standards, stating that "the Passivhaus standard does not specify a non-carbon emitting at the point of use heating source", but recognised that:

> "Passivhaus aims to achieve an annual heating and cooling demand of no more than 15kWh/m² per annum and this itself will reduce the carbon output from new homes" (ORG_062, West Lothian Council, 196167607).

West Lothian Council added that:

> "Any comparative standard would need to be in line with the Scottish Governments 2024 New Build Heat Standard that will require all new homes in Scotland to use heating systems which produce zero direct emissions at the point of use from 2024 onwards".

Homes for Scotland, also partially supportive in relation to this question, expressed a concern that adopting the Passivhaus method for new build homes would only address part of the problem:

> "it should be noted that new homes by percentage is only a tiny part of the jigsaw and the significant issue to be addressed is the existing housing stock across Scotland which is predominantly responsible for emissions from residential buildings. Current standards in new homes

> are extremely high and carbon emissions are very low indeed" (ORG_030, Homes For Scotland, 196269820).

Cala Group Ltd, which was also partially supportive in relation to this question, made a similar argument:

> "New build will likely be a small proportion of emission contributors compared to existing housing stock and other building types" (ORG_010, Cala Group Ltd., 196369784).

The Scottish Federation of Housing Associations, whilst partially supportive of the adoption of Passivhaus methods in new builds, reflected on the need to take action to reduce the "whole life" emissions from buildings:

> "The Passivhaus approach has the potential to reduce operational energy use and Green House Gas emissions. However, as operational energy demand decreases, the role of embodied energy and associated emissions will become more significant. The Sullivan Report, published over a decade ago, previously called for mechanisms to deliver 'total life' zero emissions buildings while more recently, Scotland's Climate Assembly, as referenced in the current consultation, suggested that whole life carbon costs and environmental impact should be included in building standards within the next 5 years . An approach to measuring whole life emissions would need to be developed to help understand the true impact of such a policy in reducing overall emissions" (ORG_050, Scottish Federation of Housing Associations, 196422990).

This was a point also made by Michael Laird Architects in its submission, which was also partially supportive (ORG_038, Michael Laird Architects, 196426164).

ALACHO was also partially supportive in relation to this question, and raised a wider point about education for tenants living in homes built to a Passivhaus standard:

> "It is also worth noting that tenants will require some hand holding in regards to education on how to live in homes that have new energy efficient technologies avoid wasting energy and increasing their energy costs. This will have an added cost for local authority regarding resources each time a new tenant moves in" (ORG_006, Association of Local Authority Chief Housing Officers (ALACHO), 196436725).

Opposed

Five percent of responses to this question were opposed to the view that setting the Passivhaus standard or a Scottish equivalent would be the most appropriate new build housing standards to contribute to a reduction in emissions. Reasons given for being opposed were (emphasis added):

- Improving energy efficiency should not be "**dependent on private commercial initiative**" (IND_113, Dr Tom Woolley, 190888772, Fully Opposed);

- "Sustainable options are **expensive to achieve**" (IND_372, Anonymous, 191189744, Partially Opposed; see also ORG_047, Rural Design Ltd., 192344817, Partially Opposed; and IND_285, Philippe Cortese, 195339869, Fully Opposed);

- "Evidence suggests that non-Passivhaus approaches can deliver **significant and equivalent outcomes to Passivhaus** without some of the required measures and potential costs" (IND_384, Anonymous, 191850406, Fully Opposed);

- Significant reductions in emissions can only be achieved "through **refurbishing** our existing housing stock" (IND_323, Sean Watters, 192236641, Partially Opposed; Anonymous, IND_467, Anonymous, 195621809, Partially Opposed);

- "Current building regulations **do not require amendment**" (IND_091, David MacPherson, 194118072, Fully Opposed; see also ORG_041, North Lanarkshire Council, 196393539, Fully Opposed);

- "**Passivhaus is not a zero carbon standard**. Significant amounts of energy are still required to generate hot water". (ORG_071, Anderson Bell Christie, 196396919, Fully Opposed).

Neutral/Unsure

Of the responses to this question, 3% took a neutral position, whilst 1% were unsure. Reasons given for those positions from those who commented were:

- "The standard will depend on the area and the **availability of materials**" (IND_349, Thomas Taylor, 194105760, Neutral);

- "Better value for money would be achieved **by targeting retrofit of 20th Century properties** which form the bulk of our domestic housing stock" (IND_280, Peter Drummond, 195500699, Neutral);

- "To reduce carbon emissions from new build we need to **legislate for permitted levels of embodied carbon in new build construction**" (IND_125, Euan Lochhead, 192568467, Neutral).

A number of responses indicated that they did not have sufficient information to make an informed judgment; (for example, IND_189, John McKnight, 194114280, Unsure; IND_177, Janusz Knepil, 194148327, Unsure; IND_118, Edward A. J. Ferrari, 194160938, Neutral).

Question 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? (Fully supportive / Partially supportive / etc.)? 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.

Six hundred and fifteen respondents (98% of the total) answered this question.

Supportive

Of the 615 respondents, 85% were supportive (72% fully supportive; 13% partially supportive). Of the organisations which responded to this question 83% were supportive (57% fully supportive; 26% partially supportive). Arguments made by those who were supportive of the process set out included:

Independent verification

There should be independent verification

A point made by some organisations that were supportive of the process outlined was that, independent, accredited verification of the building was important. For example, Stewart and Shields Ltd (Fully Supportive), stated:

> "The process shown is very good but your own flow chart identifies the VITAL missing link and that is "Independent Assessment" of the build. The solution is simple; adopt Passivhaus as the standard and also then appoint trained and qualified assessors to slot into that gap. This will ensure the ends are met and the action will reduce the overall cost of Passivhaus implementation" (ORG_052, Stewart and Shields Ltd, 191701696).

Bellyeoman Community Council was also supportive of independent verification, adding that:

> "Using Government or Local Authority certifiers is not recommended as this risks those individuals being stretched through the demands of other priorities/ staffing pressures within their organisation and could dilute the effectiveness of the scheme. The existing planning condition enforcement regime shows the fallibility of relying on diminished resources for compliance purposes" (ORG_008, Bellyeoman Community Council, 194173387).

Climate Action Strathaven added:

> "The key aspect is the independent verification of the work done allowing contractors to prove and feel justifiably proud of the work they

> have done to ensure all our citizens can live sustainably for the future" (ORG_012, Climate Action Strathaven, 193259269).

Similarly the joint response from Common Weal; the Built Environment Asset Management (BEAM) Centre, Glasgow Caledonian University; The Energy Poverty Research initiative; and Atkins Architecture (submitted by Dr Keith Baker) stated:

> "We fully support this revised process on the basis that including the need for post-construction / post-occupancy by a suitably qualified professional is something we have been advocating as being essential for many years" (ORG_014, Dr Keith Baker FRSA – Research Fellow in Fuel Poverty and Energy Policy, et al, 194332039).

Loreburn Housing Association added that, in its view:

> "the individual verifying the properties performance once complete should sit outside of any of the other new build process to remain impartial and independent" (ORG_035, Loreburn Housing Association, 194623779).

White Hill Design Studio LLP stated that:

> "it is not possible to deliver PassivHaus quality buildings if they are not inspected and certified by an accredited verifier during construction" (ORG_064, White Hill Design Studio LLP, 195697863).

The Dormont Estate Partnership was partially supportive, and drew on personal experience in stating that:

> "Verification must be done by a qualified Passivhaus designer and must be done before the house is fitted out to ensure that the walls are exposed to any taping that may be required" (ORG_019, Dormont Estate Partnership, 195817732).

Michael Laird Architects stated:

> "We believe it would be beneficial for the verifiers to be independent of the local authorities. The Passivhaus verifier could be treated similar to that of an airtightness tester, SER [Structural Engineers Registration] certifier or BREEAM [Building Research Establishment Environmental Assessment Methodology] Assessor etc whereby an independent company with the relevant qualifications / experience and resource provide an evidence-based document to the local authority demonstrating that the works comply with the as-designed calculations. This would in turn also be submitted to the Passivhaus Institute for their approval" (ORG_038, Michael Laird Architects, 196426164).

Similarly the RIAS stated that it:

> "supports a significant level of independent oversight and inspection of building contracts" (ORG_054, The Royal Incorporation of Architects in Scotland (RIAS), 196277943).

The Scottish Ecological Design Association gave reasons as to why it supported this approach:

> "One of the reasons the Passivhaus process works is because qualified designers are usually appointed early in the process as part of the design team. Another reason it is successful, is because the work of the designer(s) and the contractor(s) is checked by the verifier throughout the process to ensure that what is designed on paper is built and that the finally construction meets all the rigorous requirements. It has been evidenced that independent verification of passive house schemes lead to the high quality of the design and construction" (ORG_049, SCOTTISH ECOLOGICAL DESIGN ASSOCIATION, 196428561).

There should not be independent verification

However, other organisations that were supportive of the process were less supportive of independent verification by an accredited Passivhaus verifier. For example, West of Scotland Housing Association stated:

> "I don't support the certification process by an accredited Passvihaus verifier. I believe that a performance led specification approach with a set of criterions that is sent to building control for approval is sufficient. There are limited Passivhaus certified consultants in the UK. The cost to appoint PHPP consultant can be high, and the process is extremely time consuming to check, document and submit the required level of information/evidence for checking during the construction period. In order to achieve certification, you also need to install certified Passivhaus products which are limited in choice, difficult to source and expensive. A performance led approach would provide greater flexibility whilst still delivering the high energy efficiency standards through a fabric first approach that a fully certified Passivhaus standard would achieve" (ORG_063, West of Scotland Housing Association, 193343147).

The union, ASLEF, stated that:

> "It would make sense if the verifier was part of the relevant Building Control Department as it would ensure that the number of verifiers and their training etc. is maintained centrally avoiding any price increases that can be in place with contractors or an independent body" (ORG_005, ASLEF, 196100971).

The Flat Glass Manufacturers' Association (FGMA) made a similar point:

> “It would make sense for the necessary verifier and inspection skills to be developed and be situated within the Building Control Department. The logic to this is based on the principle that building performance standards must be increased and therefore that knowledge and expertise ought to be part of the BCD core competence” (ORG_025, Flat Glass Manufacturers’ Association (FGMA), 196426810).

Homes For Scotland added:

> “Should we have a Scottish Equivalent Standard by 2024/25 as is proposed then it would be reasonable to suggest that the compliance monitoring could be carried out by the Local Authority Building Control Departments (LABSS). No doubt that this will be a resourcing problem to be resolved but there is time for Scottish Government to plan, fund and action accordingly” (ORG_030, Homes For Scotland, 196269820).

Fife Communities Climate Action Network CIC made some suggestions as to how verification could work:

> “Verifiers could be either local authority or independent verifiers. If they are independent, they must be entirely separate from any construction company or supplier. They should be on a controlled register of competency administered by the Scottish Government” (ORG_023, Fife Communities Climate Action Network CIC, 192429660).

Unite the Union added that:

> “The verification process must therefore allow for skilled, direct labour to be involved in the delivery of the work. This would ensure that the work is being undertaken by those with the appropriate skills, training, qualifications and competence, using safe and qood quality materials, and that completed works are inspected for full compliance with building safety and energy efficiency standards” (ORG_059, Unite the Union Scotland, 196401286).

The Scottish Federation of Housing Associations made a more general point about availability of qualified Passivhaus verifiers:

> “If specific Passivhaus certification were to become a requirement, as suggested in the current consultation, this would require access to appropriately qualified Passivhaus verifiers. The availability of experienced individuals to take on this new role in unclear given there are already issues with the resourcing of Building Standards departments and a more general skills shortage in the building industry. There would therefore need to be plans in place to ensure a sufficient number of qualified individuals are available to deliver this additional requirement” (ORG_050, Scottish Federation of Housing Associations, 196422990).

Cost issues

Others who were supportive overall of the process set out by the proposal did however express concern that costs may be a prohibitive factor. For example, one anonymous response stated:

> "The additional costs incurred to achieve this standard and verify the performance will impact on viability" (ORG_065, Anonymous, 192386123, Partially Supportive).

The Inverkeithing Trust also highlighted that the verification process may lead to increased costs for local authorities and that this may have a negative impact on other services. As such the Trust argued that, should that be the case, then "the work might be contracted out or undertaken by independent professionally-trained verifiers". If so, it argued that proper scrutiny of methodology and outcomes would be needed to ensure consistency (ORG_031, Inverkeithing Trust, 192441237).

The Highlands and Islands Green Party, which was fully supportive on this question, stated:

> "We recognise that there could be savings in cost and time by having the certification done in-house by Building Control officers; however there is also the danger that a) Building Control officers will be too over-stretched to provide sufficient scrutiny of new buildings, or b) there could be perceived conflicts of interest for Building Officers being part of a Council team that awards planning permissions and issues Building Warrants and Completion Certificates - the danger of slippages of standards working their way upstream to the construction or design phases could significantly reduce the effectiveness of these standards to deliver the fuel poverty ad emissions targets they are designed to do" (ORG_028, Highlands & Islands Green Party, 192564813).

South Lanarkshire Council was partially supportive of the processes laid out in the proposal, but noted the resource implications of verification:

> "Consideration should however be given to additional resources required to meet additional inspection and enforcement services required to be launched by councils, as well as additional skills set required across the industry to ensure standards are applied correctly" (ORG_051, South Lanarkshire Council, 195699628).

A similar argument was advanced by West Lothian Council:

> "The introduction of a Passivhaus Verifier for every new home would add a further layer of cost, time and certification to the existing process. We would note that our view would be for any verifier required to work within the current Building Standards Divisions to ensure a continuity of processes. If the Verifier was not to come under direct control of Building Standards Divisions, consideration would need to be given to

a process of resolving any issues within the industry as a whole. Consideration needs to be given to resourcing this role as it will require additional staffing" (ORG_062, West Lothian Council, 196167607).

Need to require developers to act sustainably

A further argument that was made by some organisations in response to this question was that developers would not make buildings more sustainable unless and until they were required to. This argument was made by some organisations that were supportive of the process as they considered that it would ensure that new standards are met in all new build housing. For example, Scone and District Community Council stated "Developers won't do sustainability unless forced to" (ORG_048, Scone & District Community Council, 191304008), whilst the Perth & Kinross Branch of the Scottish Green Party (also fully supportive) made a similar point:

> "We know that legislation is needed as the past 5 [years] in our area has seen no real improvement in sustainable standards in developments, as developers don't have to do it by law" (ORG_044, Perth & Kinross Branch of Scottish Green Party, 191304986).

Opposed

Four percent of responses (28 responses) to the consultation indicated that they were opposed to the process outlined. Of those, 50% were fully opposed (14 responses) and 50% were partially opposed (14 responses).

The following comments were made for being opposed to the process set out in the proposal (emphasis added for ease of reference):

- "chasing ever higher standards comes up against the problem of having an **industry capable of delivering**" (IND_323, Sean Watters, 192236641, Partially Opposed);

- "There is **no proposed assessment of the impact of a further increase in building costs in economically vulnerable rural areas**. The affordability gap to get on the housing ladder (particularly for young people) continue to increase. The spend to save approach does not function if housing is not affordable in the first place" (ORG_047, Rural Design Ltd, 192344817, Fully Opposed);

- "It will **slow down speed of construction**, drive up costs, and have minimal effect on carbon emissions" (IND_400, Anonymous, 192412919, Fully Opposed);

- "The issue of a one size fits all scheme is that it **disproportionally affects those less well-off** and also **people in more rural or remote areas**. A Passive Haus in the central belt looks very different to a Passive Haus in the north of Scotland as the embodied and operational carbon required to keep it as warm is greater … A blanket change to the standards risks new housing only being viable for the rich"

(ORG_056, Torphins Community Council, 192695972, Partially Opposed);

- "There will be **too few verifiers** and, given the large sums of money involved in housebuilding, corruption will ensure sub-standard homes will receive certification" (IND_253, Michael Morgan, 193804793, Partially Opposed);

- **"Local Authorities are the best agencies** to carry out verification in order to avoid corruption" (IND_029, Ann G Gaunt RIBA RIAS, 191525632, Fully Opposed);

- "The proposal as currently set out **does not adequately address the implications of adoption of a third party standard within the Scottish regulatory framework**: it is simplistic and fails to take account of capacity at local authority level or likely cost impact across the sector" (IND_280, Peter Drummond, 195500699, Fully Opposed);

- "It will **take many years to eliminate the performance gap**. There is too much wishful thinking here and quoting from 'on side' sources who represent only a tiny fraction of building professionals and construction firms" (IND_210, Leslie Milne, 195729886, Partially opposed).

- "The performance gap is the difference between how a building is expected to perform and how it really performs. How it really performs can *only* be fully known after a particular period of occupant and normal use. As such, **sign off** (and the accompanying completion certificate) **cannot be reasonably issued with any confidence until *after* it is known how the building really performs**. It may be prudent to consider a two-part sign-off process: the first, when complete, to allow occupation and the second after one year (coinciding with the Defects Liability Period) once energy performance of the occupied building has been measured and verified" (IND_317, Sam Foster, 195839544, Partially opposed).

- "If this inspection requirement is placed on Building Standards, it would be an onerous burden in terms of resource and responsibility. **To address the performance gap, a project can be certified by Passivhaus Institute, or alternatively, the Certifier of Construction may be an appropriate route in terms of inspection/certifier** but again additional cost burden. Post completion there may be challenges to correct any issues in this type of construction. Future extensions and/or alterations to this type of house may pose challenges" (ORG_041, North Lanarkshire Council, 196393539, Partially Opposed);

- "Implementing a Passivhaus standard, and in-turn the use of the PHPP would not be deliverable in Scotland for all new-build houses and apartments. There are and will be **limited resources available who are accredited verifiers, trained and qualified in the relevant energy efficiency and thermal performance standards** to complete

this on circa 25,000 homes per year" (ORG_018, Donaldson Timber Systems Limited, 196433966, Partially Opposed).

Neutral/Unsure

Of the responses to this question, 11% indicated that they were either neutral or unsure on this question. A significant number of those respondents either did not elaborate on why they were neutral or unsure, or indicated that they did not have the relevant expertise to offer a view.

However, those responses which did indicate their reasoning for taking a neutral position or being unsure in relation to this question made the following comments (emphasis added):

Meeting the international Passivhaus standard

- One individual, who was fully supportive and who wished to remain anonymous, indicated that they were unsure on this question on the basis that "**It is not clear whether the intention is for the Scottish Standard to be equivalent in every way**, to the Passivhaus Standard. Would there be clear reasons why there would/could/ought to be any different, since it appears the Passivhaus Standard is already established" (IND_439, Anonymous, 194118809);

- Another individual who wished to remain anonymous and who had experience of the building industry, was fully supportive of the overall proposal but took a neutral position on this question, stating "If legislating for PH then **there is already a process for ensuring the standards are met - PH certification**. This is a proven process already in place and should be leaned on. Up skill and register building control officers and then find PH institute to meet the demand" (IND_443, Anonymous, 194130827);

- The UK Passivhaus Trust, which was fully supportive of the overall proposals, took a neutral position on this question. In its response to this question, the Trust **emphasised the importance of projects demonstrating that they meet the requirements listed by the International Passive House Institute (PHI)**.[2] The Trust recommended that "the best way to demonstrate that the quality assurance requirements have been met is through certification by an accredited Passivhaus Certifier. A project can only claim to be Passivhaus certified and use the Passivhaus badge/ plaque if it has gone through independent certification" (ORG_058, UK Passivhaus Trust, 190893415);

[2] Requirements are listed here: https://passiv.de/en/02_informations/02_passive-house-requirements/02_passive-house-requirements.htm

Links to existing monitoring processes

- Architect, Roderick Binns, who was partially supportive of the overall proposal, indicated that he was neutral on this question as “there are **more fundamental issues with how compliance monitoring and verification of construction is carried out in practice**. This relates to not only energy efficiency standards but also fire safety and other aspects of construction standards. In the majority of construction projects, there is no third party carry out regular site inspections - Building Standards will typically inspect works only once completed” (IND_302, Roderick Binns, 194130416);

- The Law Society of Scotland took a neutral position on this question, stressing “**the importance of ensuring consistency in the approach taken to verification**. This may be more challenging to achieve if verifiers independent of the Building Control Department are undertaking the process than if the process is carried out by those connected to a Building Control Department. We therefore consider that it is **most appropriate for verification to be undertaken by the relevant Building Control Department either directly and/or via contracting qualified verifiers to ensure consistency and reliability**. We highlight the resource implications that this may have, both in terms of costs and also availability of suitably qualified independent verifiers” (ORG_033, Law Society of Scotland, 196343500);

- Architect, Raymond Low, who was partially supportive of the overall proposal, took a neutral stance on this question, stating that “This new system would require a whole new group of 'verifiers' to ensure there was no performance gap between the design and the construction, whereas **investment in the current verifiers i.e. Local Authority Building Control officers would be much more cost effective**” (IND_291, Raymond Low, 195342331);

- Local Authority Building Standards Scotland (partially supportive of the proposal, but neutral on this question) also touched on existing building standards processes in its response, stating “The BSD [Scottish Government Building Standards Division] is already making significant changes to how compliance is achieved on site and while this is initially directed at high-risk buildings, the clarification on the duties of the building owner and relevant person will focus attention on the need for compliance in all new building work. **In terms of the use of an ‘accredited verifier’ this principle is already available through the certification of construction route. The principle of such a person sitting within the Building Standards Department may conflict with the Local Authority verifiers duty for reasonable inquiry and would also detract from the primary duty of compliance which rests with the building owner/relevant person**. It is noted that the diagram on page 15 of the consultation document does not include reference to checks made by the Local Authority verifier under the duty

> of reasonable inquiry" (ORG_034, Local Authority Building Standards Scotland (LABSS), 195984274).

The performance gap

The consultation document asked for specific comments on how the process might be effective in removing the "performance gap". Below are some of the comments that respondents made in relation to this matter.

North Ayrshire Council, which was partially supportive of the overall proposal, took a neutral position on this question, and argued that work was already underway to remove the "performance gap":

> "The reduction of the 'performance gap', normally referred to as the 'compliance gap' is well understood and will rely on an industry wide approach to significantly improve the design, construction and inspection of buildings. In Building Standards, this is already underway with the work of the Futures Board and the 7 workstreams" (ORG_040, North Ayrshire Council, 196410065).

The council added that:

> "The main routes to reducing the compliance gap are industry-wide training and additional resource allocated to quality and compliance. The full process from planning to design, construction and approval is already in place. The changes required to implement the standard would likely mean existing practices would need 'tweaked' and amended, acknowledging verification would be an additional stage".

The Energy Saving Trust was fully supportive of the overall proposal, but was unsure on this question, as the Trust did not have a view on how effective the process would be in removing the "performance gap" and how the proposed verification process might work in practice. The Trust did, however highlight:

> "the importance of getting this process 'right'. Research continues to point to the performance gap between 'as designed' and 'as built' i.e. the gap between how homes are designed and how homes actually perform – from an energy perspective – when built**.** Closing this gap will be vital if householders are to be protected from unnecessarily large fuel bills" (ORG_022, Energy Saving Trust, 196146484).

Alun David Watkins, a Construction Technical and Innovation Manager with 20 years experience in reducing building energy stated:

> "Passivhaus quality assurance processes are proven to remove the 'performance gap'" (IND_016, Alun David Watkins, 190830475).

Architect, James York, reflected on the role of the Certifier in Passivhaus:

"The role of the Certifier in the Passive House Standard is to ensure that the design and construction meet the stringent requirements of the standard and that the project will indeed meet the Passive House Institute's rigorous criteria. Adoption of the criteria for Passive House in a new Scottish Standard is viable and recognises that there is a more pressing drive to get homes up to standard and less of a need to have every home certified as a Passive House … One of the crucial roles that the certifier plays is to ensure that quality is being delivered. Their scrutiny of the design and any construction phase works serves as a second set of eyes on the project. They serve to uphold the standard and provide quality checks on design and workmanship. In this regard the role is essential in mitigating the risk of the performance gap" (IND_173, James York, 191676156).

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

Five hundred and sixty-two respondents (89% of the total) answered this question. As with question 2, this was not a multi-option question. Below is a selection of comments that were made on this question (emphasis added for ease of reference):

- The Law Society for Scotland highlighted "the **need for certainty and clarity in the law**. In particular, there is a need for certainty and clarity for the housing development sector given that plans are made some time in advance to enable projects to be costed, planning permission obtained and other preparatory work for developments undertaken. Uncertainty or a lack of clarity as to the law in the future has the potential to have impacts on the market" (ORG_033, Law Society of Scotland, 196343500);

- Cala Group Ltd warned that "This could represent a significant decrease in the construction of new homes. **Industry needs sufficient foresight of changes to standards to allow a transition for planning, understanding financial and technical impacts and upskilling of designers and installers**. If dramatic changes to standards are implemented without sufficient time the knock-on effect will be less new homes being built" (ORG_010, Cala Group Ltd., 196369784);

- North Lanarkshire Council expressed a number of concerns about the market effects of this proposal, including concerns about "**Increased costs for certificates of construction**; Increased costs for **certification by Passivhaus Institute** (approx £1,500 per unit); An **increase in material and testing costs** particularly given the current climate of rapidly increasing construction costs. This proposal would further exacerbate the current issues thus potentially making new building housing unaffordable for the majority of people … A reduction in private sector new-build completions will impact on Council / Scottish Government affordable housing targets as a proportion of these are

purchased ‘off-the-shelf’ from private developers” (ORG_041, North Lanarkshire Council, 196393539);

- In response to a later question (Question 10) North Lanarkshire Council highlighted that “consideration will also need to be given to **how public procurement contracts are produced**. Currently the Council operates within Public Procurement requirements for specification-based descriptions rather than named products. It is understood that **some Passivhaus specifications may require named products or suppliers**. If this is the case, then an appropriate procurement route must be determined”;

- The UK Passivhaus Trust stated that “RICS [the Royal Institute of Chartered Surveyors] highlight that higher build quality, potentially lower finance costs, lower running costs and general comfort improvements should also be considered as part of the valuation. These considerations apply to energy-efficient homes generally but are likely to be even more pronounced for a home certified to Passivhaus - because it’s the highest standard of energy efficiency, and because the rigorous certification process guarantees performance” (ORG_058, UK Passivhaus Trust, 190893415);

- Councillor Tom Marshall expressed concern that the market effect would be “**Increased costs of houses, reduction in number built**” (IND_066, Cllr Tom Marshall, 192223300);

- Rural Design Ltd, partially opposed to the proposal, expressed concern that “Social housing providers are finding the **deliverability of rural socially rented housing increasingly challenging**, and this will be exacerbated by this proposal” (ORG_047, Rural Design Ltd, 192344817).

- A few organisations indicated that the proposed Bill would have an effect on the housing market, making **new build homes more attractive than older modern homes**. For example, Craigiebuckler and Seafield Community Councils stated that “the introduction of this proposal will make new-build homes easier to sell because they will be cheaper to run. The demand may **cause price rises and make older modern homes more difficult to sell**” (ORG_017, Craigiebuckler and Seafield Community Council, 192617137);

- West of Scotland Housing Association stated that “Passivhaus standard is not widely used across the market indicating a need for wider education and perhaps incentivization**. A lack of industry knowledge, skills, available materials, and planning limitations will be the main challenges/barriers**. The non-standard products and building techniques drive up the construction costs which are already very high. The wider benefits of Passivhaus are realized at the point the property is let or sold with little benefit to the builder or property owners/managers (RSL)” (ORG_063, West of Scotland Housing Association, 193343147);

- The Renfrewshire Labour Group, which was partially supportive of the overall proposal, cautioned that “If the new prices of homes are beyond the ability of mortgage-holders, particularly those who are first time buyers, we may **inadvertently end up with a scenario whereby the most energy efficient homes are available only to higher income households**, as they will have the income to meet the higher mortgage requirements. In addition, if the supply of affordable housing drops as finances are spread to meet a higher quality but lower quantity of new affordable homes, it will mean the elimination of homelessness and wider fuel poverty will become harder to achieve” (ORG_045, Renfrewshire Labour Group, 194520902);

- Loreburn Housing Association stated “The market effects on this are initially there may be **shortage of skilled construction works able to build to this standard**. However, our experience so far is that construction confirms can adapt to develop to this standard if pushed down this route” (ORG_035, Loreburn Housing Association, 194623779);

- South Lanarkshire Council highlighted “that there may be **longer pre-construction periods because of the additional certification process** required to ensure the standard is achieved at every stage of the design and construction process. In addition, there is a **lack of suppliers and experience of designing and constructing** to such standards in Scotland” (ORG_051, South Lanarkshire Council, 195699628);

- Rockwool UK Ltd was fully supportive of the proposal, and stated in relation to this question “It is **vital** that the way standards are set through this bill **does not lock the supply chain into a narrow set of solutions, causing innovation and investment into transformative alternative approaches to building to dry up**. It is equally important in the short-term for the framework to **allow for the use of the full range of construction approaches**, including **timber frame, steel frame and masonry, recognising that timber frame is especially prevalent in Scotland**. The timescale over which a Passivhaus standard would be introduced is therefore of crucial importance. Our view is that it would take a number of years, perhaps five at a minimum, before the sector could be ready” (ORG_046, ROCKWOOL UK Ltd, 195829282);

- The Scottish Federation of Housing Associations, which was partially supportive of the proposal, made a wider point about supply chains in the construction industry “Given the current pressures on supply chains in both construction and maintenance, it may also be an opportune time to begin a conversation about the long-term future and sustainability of construction in Scotland, **exploring how we can build native, shorter supply chains for key materials, and, for example, investing in Modern Methods of Construction**. It is vital that we consider the overall impact of the procurement of building materials on

the environment and Scottish Government's wider ambitions to move towards a wellbeing economy. As anchor organisations in many communities, housing associations work tirelessly to ensure investment stays in the local economy, and it will be vital to build supply chains that allow this work to continue" (ORG_050, Scottish Federation of Housing Associations, 196422990);

- Michael Laird Architects expressed concerns about the impact of Passivhaus on supply chains "Adopting the Passivhaus standard will **increase the demand of building elements** (eg. windows) and **equipment that satisfy the Passivhaus criteria**. Without careful management and sufficient notice that will allow manufacturers and suppliers to adapt, this could lead to additional supply chain challenges" (ORG_038, Michael Laird Architects, 196426164);

- ALACHO highlighted that "The market effects of the proposed Bill would **potentially give Passivhaus a monopoly over the market as it is a proprietary system, so there would need to be a procurement exercise carried out to allow others to tender** ... An independent industry regulator would be needed, which could be the Local Authority but this would require resources and formal accreditation process set up for a Scottish Standard. There's potentially a skills shortage in the market for install and maintenance and given the current economic issues with Brexit, the war in Ukraine, inflation and Scotland's Covid recovery would there be capacity in the supply chain. Infrastructure such as sub stations would be needed to accommodate the additional capacity that would be need due to the increased demand for electricity" (ORG_006, Association of Local Authority Chief Housing Officers (ALACHO), 196436725);

- The Bakers, Food and Allied Workers Union stated "The market effects could be that it supports the growth of the supply chain in Scotland creating skills and jobs. **Scotland could be a world leader in bringing jobs and skills** through this proposal" (ORG_007, Bakers, Food and Allied Workers Union, 196003031);

- In a similar vein, Unite the Union argued that adopting the Passivhaus standard "could allow for **the reinvigoration of manufacturing in Scotland** which has seen a significant decline in the past two decades" (ORG_059, Unite the Union Scotland, 196401286);

- Architype Ltd stated that the Bill, if enacted, "would put **Scottish designers, engineers and contractors, and the supply chain for materials and equipment ahead of the rest of the UK and create a strong market position** for them to apply their expertise and products down south, when the rest of the UK inevitably adopts the same standards in the future" (ORG_004, Architype Ltd, 196439702);

- West Lothian Council expressed the concern that "there may be **supply chain issues as many of the materials, supplies and components required to deliver a Passivhaus design are sourced**

from abroad or from SME. In respect of the current labour market we would note that there may be shortage of contractors with suitable experience to deliver to the proposed standards, and that addition training and skills development in this area may be required" (ORG_062, West Lothian Council, 196167607);

- Homes for Scotland added "Challenges around **Supply Chain, advancement of new technology, inadequate electricity supply etc would all need to be resolved** and solutions implemented before new homes could be delivered across Scotland in the numbers required (circa 25,000 per year)" (ORG_030, Homes For Scotland, 196269820);

- Owens Insight Ltd stated "Major housebuilding companies would have to up their game considerably. The TrustMark scheme could be used to assure inspection standards. Imported energy costs would fall over time. Scottish firms would **manufacture decent triple glazing with external blinds, and export worldwide**" (ORG_042, Owens Insight Ltd, 196391206);

- North Ayrshire Council commented that "The price of the new homes could be cost prohibitive and decrease the desire or ability of potential buyers to purchase a new build home. This could also increase competition in the existing home market" … but that "Homes built to the enhanced standard could be more desirable. Reduced running costs are the main incentive, however enhanced building design could bring additional value to homes" (ORG_040, North Ayrshire Council, 196410065).

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

Six hundred and nineteen respondents (98% of the total) answered this question. Of those 69% considered that there would be an increase in costs (17% significant increase; 52% some increase), and 13% considered there

would be a reduction in costs (5% some reduction; 8% significant reduction).[3] A further 10% of respondents considered there would be no overall change in costs, whilst 6% indicated that they did not know.

Increase in costs

As indicated above, the majority of respondents considered that the proposal would result in an increase in costs. The following issues were raised by respondents who considered that there would be an increase in costs:

Cost of materials / design specification

Some respondents argued that there would be some increase in costs to developers, due to the cost of energy efficient materials (such as heat pumps). This was an argument advanced by, for example, Scone and District Community Council (some increase in costs) (ORG_048, Scone & District Community Council, 191304008) and the Perth and Kinross Branch of the Scottish Green Party (some increase in costs) (ORG_044, Perth & Kinross Branch of Scottish Green Party, 191304986).

Criagiebuckler and Seafield Community Council, which was fully supportive of the proposal, cautioned that:

> "The inclusion of renewable energy devices, such as solar panels, may not be welcomed by developers because of additional material costs" (ORG_017, Craigiebuckler and Seafield Community Council, 192617137).

UNITE the Union, among others, expressed concern that developers would seek to pass these costs on to purchasers (ORG_059, Unite the Union Scotland, 196401286). ALACHO expressed concern that local authorities would end up facing those costs (ORG_006, Association of Local Authority Chief Housing Officers (ALACHO), 196436725).

The West of Scotland Housing Association stated:

> "There will be an increase in costs. It is estimated that the cost to build to Passivhaus Certified Standard is around 13% more. This is due to the fact that there are limited Passivhaus accredited products and experienced builders which drives up costs and increases risks. If building to high energy efficiency standard becomes a statutory requirement, the market over time will respond with quality improving and costs reducing" (ORG_063, West of Scotland Housing Association, 193343147).

North Lanarkshire Council considered that there would be a significant increase in costs, which, in the Council's view, would result from:

[3] Figures rounded up or down to nearest percentage

> "A more onerous design specification will require increased spend to achieve Passivhaus in favour of other design options; Restricted design development will increase demand for resources (material and skilled labour) which may not be readily available in the short to medium term; Potential for reduced site capacity may impact land values given the requirements for orientation of properties and where below ground costs are significant then the average cost per unit will increase; Additional verification and inspection costs in relation to the building standards service" (ORG_041, North Lanarkshire Council, 196393539).

Anderson Bell Christie, which was fully opposed to the proposal, and which considered that there would be a significant increase in costs, argued that the proposal would lead to "a significant reduction in the number of affordable homes built in Scotland" adding that it would "prefer to see a more balanced approach to zero carbon" (ORG_071, Anderson Bell Christie, 196396919).

The Flat Glass Manufacturers Assocation (FGMA), who considered that there would be some increase in costs, argued that these were simply a necessary product of any increase in building standards, adding that:

> "The new house building industry across the whole of the UK typically builds homes to the minimum energy performance standard to comply with the regulations of the time. It is understandable that the minimum costs route for delivery is sought. By setting the benchmark at a higher level the construction industry will remain on a level playing field in terms of delivery, and the supply chain can optimise cost-effective solutions. As long as there is no ambiguity about the target then industry can innovate to deliver the necessary solutions" (ORG_025, Flat Glass Manufacturers' Association (FGMA), 196426810).

RIAS highlighted the costs of the improvement in fabric and ventilation standards:

> "Improvement in fabric and ventilation standards may also have an upward impact on the construction costs of a building envelope. However, the current regulatory regime allows this to be balanced by a reduction in cost of those building services which can be downsized or even eliminated" (ORG_054, The Royal Incorporation of Architects in Scotland (RIAS), 196277943).

Lack of suppliers in Scotland

Respondents who considered that there would be an increase in costs also cited an existing lack of suppliers for the relevant materials in Scotland.

This point was made by South Lanarkshire Council, who considered that the increase in costs would be significant but that they would reduce over time. The Council stated:

> “The extra costs associated with Passivhaus design standard are in part attributed to a lack of suppliers in Scotland and lack of experience of Passivhaus construction among contractors. The council does recognise however that as the local supply chain gathers momentum, build costs would reduce. However, this is exacerbated by the fact that construction costs have gone up due to delays attributable to the effects of COVID-19 pandemic or Brexit which have resulted in increased construction/material costs and there is nothing that suggest the costs will get back to pre-COVID levels within the next five years” (ORG_051, South Lanarkshire Council, 195699628).

Regional disparities

Some respondents highlighted concerns that costs would be disproportionate across the country. For example, Rural Design Ltd considered that there would be a significant increase in costs, stating:

> “When considering the multiplier already present on construction costs in the highland and islands, this will be a further penalty to this living in rural areas” (ORG_047, Rural Design Ltd, 192344817).

North Ayrshire Council (whose area includes Arran and Cumbrae) expressed a similar concern in relation to island communities, and highlighted that an islands impact assessment may have to be completed:

> “there is a concern that potential impacts upon our island communities may be different from those on the mainland. Reasons for this include challenges arising from additional development costs and lack of availability of labour. Therefore, an Island Impacts Assessment would likely have to be undertaken to ensure compliance with The Islands (Scotland) Act 2018” (ORG_040, North Ayrshire Council, 196410065).

Similarly, ALACHO highlighted the particular impact of the proposals on island and rural communities (ORG_006, Association of Local Authority Chief Housing Officers (ALACHO), 196436725).

Level of increased costs

A number of respondents commented on what they anticipated the level of increase to be. Local Authority Building Standards Scotland (LABSS) stated:

> “It has been estimated that the proposed changes to energy standards from the 1 December 2022 would result in increased costs of 4%, should the Passivhous standard be adopted it would be expected that the increase in costs would be in excess of 4%. LABSS would anticipate excess costs being passed to the purchaser” (ORG_034, Local Authority Building Standards Scotland (LABSS), 195984274).

West Lothian Council, which was partially supportive of the proposal, considered that there would be a significant increase in costs and expressed concern that this could impact on the Scottish Government's target for 110,000 new affordable homes by 2032:

> "West Lothian Council have recently completed two nursery buildings (non-domestic) one of which was constructed to Passivhaus Standards and one which was built to meet Building standards technical handbook 2020: non-domestic. The evidence from these projects indicated a significant cost uplift to Passivhaus Standard in excess of the 4-8% quoted[4]. As noted previously, Passivhaus is rigid in its requirements around specific materials, manufacturers, plant etc. Any comparative standard would need to provide much more flexible for procurement, material, supply chain, and cost reasons while retaining the high fabric standards required. An increase in the region of that equivalent to the recent non domestic properties, over and above the current cost of new build housing, would reduce the number of new build homes which West Lothian Council would be able to deliver over any budgeting period and ultimately may impact on the overall government target of 110,000 new affordable homes by 2032" (ORG_062, West Lothian Council, 196167607).

Manor Estates Housing Association Ltd. expressed concern that figure of 4 to 8% in the consultation document is less than that quoted by the industry media (ORG_036, Manor Estates Housing Association Ltd., 196346137). North Ayrshire Council agreed that the likely cost would be more significant than this figure (ORG_040, North Ayrshire Council, 196410065).

Cala Group Ltd expressed concern that:

> "This would likely cause a significant financial impact to industry with increases to capital costs to improve fabric values to Passivhaus levels. Notwithstanding the large increases of material costs due to other political factors over the past couple of years, the analysis looking at reducing carbon emissions by 57% over the current 2015 standards represented a build cost uplift over 15%" (ORG_010, Cala Group Ltd., 196369784).

The Scottish Federation of Housing Associations also indicated that the costs may be higher than the 4 to 8% figure, arguing that it may be closer to 15% (ORG_050, Scottish Federation of Housing Associations, 196422990).

However, Owens Insight Ltd, took a different view, stating:

> "There is evidence that the additional cost of Passivhaus is no more than 7%. That is less than 1 year's house price inflation, so is immaterial. Existing lesser quality houses will fall in price. Builders will have to absorb about half the cost increase, and over time it will be negligible. There will be savings from not having to pipe in gas" (ORG_042, Owens Insight Ltd,196391206).

[4] the consultation document envisaged an increase of between 4 and 8%

Michael Laird Architects took the view that there would be some increase in costs, highlighting a study that stated they would be around 8% falling to 4% when the standard becomes more widely adopted[5], but noted that:

> "Whilst the upfront budget is indeed very important, to evaluate the full building costs, an assessment of both the life cycle costs & life cycle value will have to be carried out. Ultimately, the market will adapt to any new legislation" (ORG_038, Michael Laird Architects, 196426164).

A similar argument was made by the Scottish Ecological Design Association:

> "The difference in cost will also reduce (and has reduced) as this standard has become more popular and access to appropriate products has increased. Product choice will also increase as new companies expand into the growing markets. This upfront investment in the construction cost is also balanced by the reduction in the energy costs to run the building. Smaller heating systems and better components may also lower ongoing maintenance costs" (ORG_049, SCOTTISH ECOLOGICAL DESIGN ASSOCIATION, 196428561).

Short term nature of costs / offsetting

Some respondents, who considered that there would be some increase in costs, believed that those increases would be short term.

For example, Stewart and Shields Ltd considered that the increases would be "slight and will be recovered and saved upon in the coming years as the need for the upgrading of the dwellings is removed" (ORG_052, Stewart and Shields Ltd, 191701696). Fife Council added that "In the long term these costs could be recovered by the builder as their product would be of a higher standard" (ORG_024, Fife Council, 192234866).

Pure Haus Ltd took the view that there would be some increase in costs, but argued that:

> "These cost increases are temporary as we scale the product production capacity of the industry. The value to economy (reduced emissions, health and fuel poverty) far outweighs and cost increase" (ORG_072, Pure Haus ltd,192517823).

ASLEF added that:

> "Whilst costs would increase for the building of Passivhaus standard homes, these costs could reduce over time as the materials needed and practices used become standard leading to innovation in the market along with greater supply. There would also be an increase in

[5] Passivhaus Trust, Passivhaus Benefits, December 2021, p. 39

> costs to train and upskill workers to build and inspect the homes" (ORG_005, ASLEF, 196100971).

Bellyeoman Community Council considered that there would be some increase in costs in the short term, setting out where those costs would be incurred and highlighting where future savings would be made:

> "The additional costs will be in the implementation of the energy conservation measures within the building and the costs of the certification. Given these will represent a small proportion of the total purchase price it is expected these can be absorbed. It is worth noting that the resale value of the property will be enhanced by the conservation measures. The additional upfront costs will be more than offset by energy cost savings throughout the life of the property and this could form part of the selling points for the property" (ORG_008, Bellyeoman Community Council, 194173387).

In a detailed joint submission, Common Weal; the Built Environment Asset Management (BEAM) Centre, Glasgow Caledonian University; The Energy Poverty Research initiative; and Atkins Architecture made a similar argument to Bellyeoman Community Council, namely that there would be some increase in costs in the short term offset by savings in the longer term:

> "Given that any changes in the Building Standards require developers working to the minimum standards to adapt their practices, it would be reasonable to expect that this Bill will lead to some increase in costs. However, we would expect this to be short-term and, to some extent, offset by energy savings to occupants, and for larger developers to minimise these (if they choose to do so) through economies of scale (ORG_014, Dr Keith Baker FRSA – Research Fellow in Fuel Poverty and Energy Policy, et al, 194332039).

This joint response stated that the increase in construction costs may be in the region of 5 to 10%.

Reduction in costs

Of the respondents to this question, 13% considered that there would be a reduction in costs (8% significant reduction; 5% some reduction).

Initial costs but longer term savings

Many of those who considered that there would be a reduction in costs recognised that there would be a short term increase in costs but that this would lead to longer term savings, mainly in respect of reduced energy usage in the long term (a point that was also made by some respondents who considered that there would be an increase in costs). This argument was made by Helical Systems Ltd:

> “In the short term there will be a slight increase in costs but in the longer term there will be a greater reduction in costs” (ORG_027, Helical Systems Ltd, 195353388).

Community councillor, Paddy Coffield, made a similar argument “Although there would be some increase initialy, the savings would be significant longer term” (IND_269, Paddy Coffield, 192684244), whilst Elizabeth Corke, a professional with expertise in the area stated “an initial increase in costs but long term it will have a hugely beneficial effect saving costs. Fuel bills will be significantly reduced for those buying/living in the home too” (IND_120, Elizabeth Corke, 193139382). Frank Musgrave summarised it as an “Increase in capital costs, decrease in running costs” (IND_130, Frank Musgrave, 193698971).

Gemma Grant added:

> “It might cost a bit more to implement, but the savings for the home owners/ renters will more than balance that out in the long term with savings made on energy costs. We also can’t put a price on trying to make homes more environmental friendly when we are in a climate crisis” (IND_135, Gemma Grant, 194105367).

Paul McIntosh noted that:

> “housing is a long-term investment investment, cost of ownership and operating costs will be reduced. initial costs might be slightly higher, but this new technology is reducing in cost all the time, and mass roll-out will normalise this cost anyway” (IND_273, Paul McIntosh, 195353771).

The UK Passivhaus Trust advanced the argument that householders would experience a significant reduction in costs. The Trust stated:

> “The cost to individuals in homes will be significantly less due to lower bills. The cost to build these homes will be slightly more, projected to be around 4-8% reducing as the sector up-skills and supply chains adjust to the new construction techniques. Passivhaus buildings have access to Green Finance, whole life cost savings and reduced maintenance costs due to the high quality construction. Research also shows Passivhaus homes have lower management costs with show shorter vacancy periods and reduced rent arrears” (ORG_058, UK Passivhaus Trust, 190893415).

Coast2Coast Architects advanced a similar argument:

> “Initial capital expenditure would increase by a small percentage (estimated at 4%) however this is off-set by reduced Operating costs & rising energy prices. If the designed life-cycle cost of the dwelling is taken into account then a net Saving is always generated” (ORG_013, Coast2CoastArchitects, 192021144).

Transition Black Isle stated “The small increase in construction costs will be more than matched by a reduction in energy consumption” (ORG_057, Transition Black Isle, 192622580). Loreburn Housing Association made a similar argument and further argued that “the Health and Wellbeing benefits of living in a well ventilation and warm will have a substantial financial impact on cost savings for the NHS” (ORG_035, Loreburn Housing Association, 194623779).

The Energy Saving Trust argued that the proposal would lead to a significant reduction in costs, highlighting what it considered to be the cost of not legislating for a standard equivalent to Passivhaus:

> “The price (for consumers) of not building to ultra-high levels of energy efficiency (consistent with a space heat demand of 15kWh/m2/yr) could be high: without it they risk having to pay to refit today’s new homes with additional energy and carbon saving measures in ten or twenty years’ time, in order to ensure national climate change targets are met. As such when thinking about the costs of a zero carbon new build homes policy, we also need to factor in the avoided costs that would otherwise have to be paid for refurbishment between now and 2050” (ORG_022, Energy Saving Trust, 196146484).

Andrew Will, a Member of the Scottish Youth Parliament with experience in the Young Scots COP26’s co design group, made a similar argument and placed the issue in a broader context:

> “With the cost of living soaring, energy prices are higher than ever. If a house is poorly insulated, this negatively impacts a family’s financial situation and increases the impacts and inequalities of poverty due to money going into more heating. With this bill put in place, energy spending becomes reduced, therefore helping family’s save and giving them the opportunity to invest their money into other essentials such as healthy food and quality clothing. To ensure we are cost minimum we become a large user and generator of climate energy which brings down cost, offers new jobs to people and makes us less reliable on country’s as seen in the Russia/Ukraine conflict” (IND_025, Andrew Will, 195523426).

Initial training costs

Some respondents who considered that there would be a reduction in costs acknowledged that to achieve such reductions there would be a need for training in how the Passivhaus standard will operate within the construction industry, combined with an emphasis on companies employing dedicated Passivhaus designers or technicians. These were points made by, for example, George McGregor (IND_139, George MacGregor, 192324215) and architect Nick Hobson (IND_264, Nick Hobson, 191080485).

Other issues

Other issues that were highlighted by respondents who considered that there would be a reduction in costs were (emphasis added for ease of reference):

- The fact that there is an **existing cost to society of carbon in respect of health and environmental damage** that will be removed by the introduction of a Passivhaus standard (IND_334, Stephen Mitchell, 194146721, some reduction in costs; IND_363, Wolfgang Feist, 196404410, significant reduction in costs);

- Whilst initial costs may be high, a **combination of reduced operating costs and new technology and a mass roll out** will normalise and reduce costs (IND_273, Paul McIntosh, 195353771, significant reduction in costs);

- Adoption of the Passivhaus standard for all new build homes will also **generate an after-market of retrofit products for older housing** (IND_321, Seamus Crowe, 195361046, significant reduction in costs);

No overall change in costs

Of the respondents to this question, sixty-two (10%) took the view that there would be no overall change in costs. In practice, those respondents who gave their reasoning for taking this view considered that this would be due to there being an increase in costs in the short term followed by savings in the short term (the same viewpoint as others who ticked one of the reduction in costs and increase in costs boxes). Whereas in general those who considered there would be an increase in costs considered that initial costs would outweigh longer term savings, whilst those who considered there would be a reduction in costs tended to consider that the longer term savings would be higher, those who took the view that there would be no overall change in costs tended to take the view that these costs would balance.

For example, Joan Brown, stated “Adopting a passivhaus standard for Scotland's new build housing would increase construction costs, but it would at the same time reduce spend on energy and environmental improvement” (IND_180, Joan Brown, 191223162), whilst Andrew Arnott drew on experience of existing Passivhaus builds:

> “for a new build it has been demonstrated by the passivhaus trust that large-scale passivhaus developments benefit from reduced costs of heating equipment and often reduced costs of construction materials due to the benefits of simplified designs (which are also more material efficient). This balances out any increase in costs associated with improved insulation and air tightness” (IND_019, Andrew Arnott, 192407412).

This was an argument reinforced by Rory Kennon:

> “Whilst studies have shown that there is an initial increase in costs when building to PH standard these costs can be returned over the

> building's lifetime. Contractor's with experience in building to PH standard, learn to adapt and streamline their construction process to bring PH construction costs in line with those for a standard dwelling house" (IND_307, Rory Kennon, 192080484).

Architype Ltd, an architectural practice, stated:

> "For consumers, this will deliver dramatic reductions in the cost of heating their houses year on year, which at a time of rising energy prices will be a massive benefit. There would be an initial modest increase in capital cost as the perceived risk of the unknown are priced in, but upskilling and market competition will ensure prices stabilise, Our experience over the last 15 years is that Passivhaus can be delivered for a similar capital cost" (ORG_004, Architype Ltd, 196439702).

Paul Jackson, who had 25 years experience in the building trade, and who had just completed a dissertation on the procurement of Passivhaus projects in the UK, made a similar point to a number of other respondents who considered that there would be a reduction in costs:

> "Any investment in better housing will see fuel bills significantly reduce, better living conditions and a healthier population leading to a reduction in the NHS budget. To deliver the Passivhaus standard the recommendations of the Egan Report[6] should be considered where a partnering approach, supply chain management, collaborative working and early contractor involvement significantly reduces costs as demonstrated within the manufacturing industry and within recent research investigating the procurement of Passivhaus projects in the UK" (IND_272, Paul Jackson, 192431008).

Stanley Charles Cook added that building to a Passivhaus standard would lead to increased resale value in the long run (IND_330, Stanley Charles Cook, 194174947), whilst Graeme Russell argued that there would also be "a positive impact for employment, infrastructure improvements, local services (shops etc.) could gain from an increase in footfall" (IND_147, Graeme Russell, 194202703). The Dormont Estate Partnership stated that "Any extra costs will be clawed back within 5 years in energy savings, better health and better educational attainment" (ORG_019, Dormont Estate Partnership, 195817732).

Stuart Dyer expected "cost to quickly return to standard levels but perhaps with a slight initial increase" (IND_339, Stuart Dyer, 192896969), John Padbury took the view that "Volume production reduces unit prices" (IND_191, John Padbury, 192949478), whilst Lewis Andrew Henry stated that "Initially [there will be] an increase in costs but once the expertise and process have been fully utilised the costs will come down" (IND_212, Lewis Andrew Henry, 194102331).

[6] Rethinking Construction – The Egan Report - Constructing Excellence

Thomas Taylor took the view that the level of costs “would depend on how the proposal was instigated how the materials were sourced [and] jobs created” (IND_349, Thomas Taylor, 194105760).

Oliver Goddard argued that:

> “It is cheaper to conserve energy from investing into the building fabric than paying for the generation of electricity to heat homes. Upfront costs are quickly [paid] back from energy savings on annual heating bills” (IND_267, Oliver Goddard, 195428369).

Architect Graham Acheson believed the long term cost of building a Passive House “should be very similar to building to current standards” adding that “This has already been proven in other countries” (IND_148, Graham Acheson, 195545622).

Don’t know

Thirty-five respondents (6% of respondents to this question) indicated that they didn’t know whether there would be an increase or reduction in costs. The majority of these respondents did not expand on their reasoning for taking this view. However, of those that did, the following comments were made:

The Highlands and Islands Green Party stated:

> “The answer chosen depends over what timescale you assess costs ... Once all new homes become Passivehaus (etc), then the overall costs of capital (buying the house) and revenue (running it) should be similar to buying and running an older house. Those people who are buying a Passivhaus for the first time MIGHT pay more for the purchase, but housebuilders ad mortgage providers will find ways of 'smoothing' the mix of higher capital cost and lower revenue costs. This is less of a problem with social housing where rents can be managed. More social housing to Passivhaus standard also will achieve greater benefits (cost, comfort, health) for those who need it most” (ORG_028, Highlands & Islands Green Party, 192564813).

Architects Climate Action Network Scotland indicated that it didn’t know whether there would be an increase or reduction in costs, but reflected on the wider context:

> “Better question would be what is the cost of doing nothing? What is the cost currently facing people from rising builds? What is the cost to their health living in a substandard home? There are both costs and savings to be made. There is an approx 10% on-cost for Passivhaus as compared to a house built to Technical Standards. So the purchase price of a new build would be higher, but lower running costs mean this on-cost is recouped over time. Everyone wins from lower levels of pollution, as the risks of damage from climate change induced weather

> events is reduced. The on-cost would reduce as this form of construction becomes more common, and there is competition/ innovation in the supply of the more expensive components" (ORG_003, Architects Climate Action Network Scotland, 196443628).

Roger Colkett stated:

> "Although initially construction costs might increase, competition to achieve common standard plus learning from existing Passivhaus practice both here and abroad should reduce the level of increase and in effect there will be a trade off between a probable higher initial capital cost versus a significant saving in running cost. How that balance works out may well depend on the cost of borrowing i.e. interest rates" (IND_304, Roger Colkett, 194125923).

Rab Walker indicated that he didn't know whether there would be an increase or reduction in costs, but noted that:

> "something new might have to take funding from other funded-projects, but this is a necessary change on two fronts - ethically humanitarian and a strategic response to climate change" (IND_288, Rab Walker, 192149062).

One respondent, who wished to remain anonymous, indicated that they didn't know whether costs would increase or reduce, but noted that:

> "Passivhaus building requires specific building components, many of which are more readily available in other countries/ Europe" (IND_462, Anonymous, 195351639).

Question 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.

Three hundred and six respondents (48% of the total) answered this question. Of those who answered the question, the main issue that emerged about the impact of the proposal on particular people if it became law was that there would be a positive impact of better quality housing on vulnerable groups. Other issues (both indicating positive and negative impacts on equalities) were also raised, and these are covered in bullet points below that heading.

Impact of better quality housing on vulnerable groups

An argument advanced by a number of respondents to this question was that there would be a positive impact on some groups of the better quality of

housing that would be built were a Passivhaus standard to be adopted. Some of those responses are highlighted below.

The UK Passivhaus Trust argued that there are "many interconnected social benefits from Passivhaus construction", adding that these include:

> "better comfort and wellbeing, improved mental and physical health, education and skills attainments – which in turn may benefit the economy and society. Passivhaus effectively eliminates fuel poverty, with positive health outcomes from better quality housing consistently strongest among vulnerable groups, including children, the elderly and those with pre-existing illnesses" (ORG_058, UK Passivhaus Trust, 190893415).

Coast2Coast Architects added that:

> "All Rental Sector accommodation should be upgraded / and / or designed to Passivhaus Standard in order to protect the lowest income and vulnerable sector of the community" (ORG_013, Coast2CoastArchitects, 192021144).

The Energy Saving Trust stated:

> "Fabric first standards will help to keep people out of fuel poverty. As noted in our response to question 3 above fabric first standards 'lock in' energy saving and make dwellings much cheaper to heat (because less heat is needed) and more comfortable to live in. The cheaper a home is to heat the less likely its occupants are to fall into fuel poverty" (ORG_022, Energy Saving Trust, 196146484).

North Ayrshire Council stated:

> "Fuel poverty affects the poorest and most economically disadvantaged. New build homes being built to enhanced standards should reduce fuel bills, and as a result, should improve quality of life for tenants / homeowners in those properties. Poor quality housing is linked to poor health and wellbeing. Enhanced standards should help break this link and improve internal comfort and environmental conditions, resulting in improved health and wellbeing" (ORG_040, North Ayrshire Council, 196410065).

Michael Marra MSP stated that:

> "The proposals will have a positive impact on those currently living in fuel poverty, something which we know is more prevalent amongst low income families and those living with additional support needs" (NSS_003, Michael Marra MSP).

Paper Igloo Ltd made a similar argument:

> "By improving the quality of new build construction there is a direct benefit to the occupants of those buildings by reduction in

condensation, mould formation, and temperature swings. Better living conditions allow less money to be spent on heating and lighting, leading to less people in fuel poverty, a better quality of home, and so less people living in sub-standard accommodation" (ORG_043, Paper Igloo Ltd., 192400693).

Fife Communities Climate Action Network CIC stated:

> "More vulnerable people tend to spend a higher amount of income on heating. Lower energy housing would benefit those people" (ORG_023, Fife Communities Climate Action Network CIC, 192429660).

The Bakers Food and Allied Workers Union commented that:

> "the proposal would benefit people on low incomes which includes many of our members and also those with disabilities, it will have a positive impact in everyone" (ORG_007, Bakers, Food and Allied Workers Union, 196003031).

Other issues that arose

The following other issues were raised by respondents to this question:

- Loreburn Housing Association highlighted the importance of ensuring, that if the Bill were to be enacted, "**people with disabilities have support** to help with managing the maintenance of a mechanical ventilation system, which need to be cleaned every two to three months and replaced every six months" (ORG_035, Loreburn Housing Association, 194623779);

- However, Unite the Union Scotland stated that it saw "**specific advantages for disabled people** for example, who often have lower incomes and the new law could assist in reducing their energy costs" (ORG_059, Unite the Union Scotland, 196401286);

- Helical Systems Ltd stated that "It will be **beneficial for all** but it will have a **greater effect on the older generation**" (ORG_027, Helical Systems Ltd, 195353388);

- Rural Design Ltd stated that the Bill would "particularly **disadvantage people living in rural areas**" (which was a point raised under Question 7) (ORG_047, Rural Design Ltd, 192344817). North Ayrshire Council made a similar point, specifically highlighting the impact on island communities (ORG_040, North Ayrshire Council, 196410065);

- South Lanarkshire Council expressed concern that, if the cost of building materials continues to rise and funding levels are not increased, "**delivery of affordable housing supply programme[s] could decrease, and this could adversely impact vulnerable**

homeless households or those requiring wheelchair/adapted or large family homes" (ORG_051, South Lanarkshire Council, 195699628);

- Homes for Scotland expressed concern that "There will be a very real danger that the implementation of legislation to mandate such standards in the short to medium term will **push house prices higher and out of reach of first time buyers** etc and will affect the affordable homes sectors ability to meet Governments targets for social housing provision especially when RSL's have such a significant challenge ahead with their retrofit programmes" (ORG_030, Homes For Scotland, 196269820);

- Similar concerns to those of Homes for Scotland were raised by North Ayrshire Council (ORG_040, North Ayrshire Council, 196410065) and by North Lanarkshire Council, who added a further comment that "**Gender budgeting** may be a concern and should be considered" (ORG_041, North Lanarkshire Council, 196393539);

- Anderson Bell Christie expressed concern that, if a Passivhaus standard were to be adopted then "others on the housing waiting lists would be denied access to a new affordable home, as the capital budget would not be able to deliver as many homes compared to a more balanced approach" (ORG_71, Anderson Bell Christie, 196396919);

- Constructive Individuals Ltd, which was fully supportive of the Bill proposal, stated that he considered that "it will only have an discriminatory impact because capital cost will increase and that will favour wealthier people" (ORG_016, Constructive Individuals Ltd, 196399757);

- ALACHO stated that "the proposed Bill or enhancement of Building Standards would have both positive and negative impacts on certain groups in society. The **positives for the young, elderly and vulnerable** will be that their **whole home will be warm** and not just one room, which is often the decision tenants have to make in the winter to keep bills low. The **negatives for the same group** could arise if homes are **not able to be cooled sufficiently in the summer time** as we begin to see much higher temperature and prolonged heatwaves. How user friendly the controls and optimisation of systems for heating and hot water are could result in the elderly and those with disabilities not being able to use their systems efficiently resulting in higher energy costs" (ORG_006, Association of Local Authority Chief Housing Officers (ALACHO), 196436725).

Question 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? 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?

Four hundred and seventy respondents (75% of the total) answered this question.

General

A significant number of respondents indicated that the proposed bill will have a positive impact on all the areas listed (enhance the environment, sustainable economy and strong healthy and just society). Many responses touched on all those areas.

For example, the Highlands & Islands Green Party stated:

> "This proposal would have strong positive impacts across all of these areas: more sustainable designs and construction materials, better skilled workforce, quality jobs across Scotland, healthier occupants, less inequality between those who can afford to pay their way to a better house and those who cannot" (ORG_028, Highlands & Islands Green Party, 192564813).

West of Scotland Housing Association highlighted the environmental and health benefits of the proposal:

> "Enhancing the buildings fabric will in turn reduce residents' energy demand and our carbon footprint which would have a positive impact on the environment. Installing MVHR systems provides constant clean filtered air, creates an ambient temperature, and reduces condensation/mould, all of which will deliver health benefits" (ORG_063, West of Scotland Housing Association,193343147).

Climate Action Stathaven argued:

> "I cannot understand why anyone would be negatively impacted by this proposal - how can reducing fuel poverty, improving air quality, equalising opportunity (via social housing having the proposal applied) and the many, many other benefits of our citizens living more sustainably be anything but positive" (ORG_012, Climate Action Strathaven, 193259269).

Noel Wright Architects Ltd added:

> "In the long run there is a good argument that the proposed law could help achieve all these positive benefits" (ORG_039, Noel Wright Architects Ltd, 195347582).

South Lanarkshire Council stated:

> “The proposals will undoubtedly have positive impacts on the environment, the occupants, and the wider population. The Council notes with the appropriate financial backing, the proposals will help maintain a stable level of economic growth and employment, whilst reducing resource consumption, producing clean passive energy, protecting the natural environment, and enabling a quality of life with improved indoor air quality” (ORG_051, South Lanarkshire Council, 195699628).

Community Energy Scotland argued that:

> “Long term, impacts will be positive for all three pillars of sustainability. It is important that research into its implementation includes detailed supply chain analysis and related carbon and social justice assessment” (ORG_015, Community Energy Scotland, 196103492).

West Lothian Council, which was partially supportive of the bill proposal, stated that, in respect of sustainability, building to a Passivhaus standard would help it to deliver on a number of the priorities in its Corporate Plan 2022/23 and its Climate Change targets, but added:

> “In order to avoid negative impacts by the introduction of new minimum environmental standards we would reiterate the point that Passivhaus certification is rigid in its requirements and that any comparative standard would need to provide much more flexible while retaining the high fabric standards required. In addition, we would recommend that cognisance needs to be taken regarding the current number of certified Passivhaus Verifiers and the effects adding an addition layer of certification and inspection in to the process will have on housing supply” (ORG_062, West Lothian Council, 196167607).

Transition to net zero

The main reason given that the Bill proposals would have a positive impact on sustainability was that it would make a significant contribution to the transition to net zero.

Fife Council stated:

> “The bill would make a significant contribution to enhancing the environment and support a sustainable economy” (ORG_024, Fife Council, 192234866).

The Inverkeithing Trust added:

> “Although not net zero, applying the rigorously high Passivhaus standards to Scotland's buildings and homes would dramatically increase energy efficiency, with the resultant positive impact on the environment and a reduced reliance on the use of fossil fuels. Legislation to enforce and ensure these standards across the board

> would help to bring equality in the workplace and home in terms of health and affordability" (ORG_031, Inverkeithing Trust, 192441237).

Kirknewton Community Development Trust stated:

> "Reduced reliance on fossil fuels has to have positive social and economic benefits as well as satisfying climate change and zero carbon pledges made by governments" (ORG_032, Kirknewton Community Development Trust, 193620806).

Marchmont and Sciennes Community Council added:

> "Of course this new law will impact positively on enhancing the environment. The spin-off will be to focus on dramatically improving the insulation of the existing housing stock" (ORG_037, Marchmont & Sciennes Community Council, 194216187).

Loreburn Housing Association stated:

> "With Passivhaus properties requiring little energy to heat the home it can be run from a renewable heat source. With this, once the grid is fully decarbonised, this will make a Passive home a net zero home" (ORG_035, Loreburn Housing Association, 194623779).

More just society and sustainable economy

Other responses argued that the Bill proposal would contribute to a more just society and would have a positive effect on creating a sustainable economy.

In considering the longer term impacts of building to a Passivhaus standard, some respondents re-stated a point made elsewhere in the consultation that building to a Passivhaus standard would result in a reduction in levels of fuel poverty. For example, Dormont Estate Partnership stated in response to this question:

> "Building to certified PH standard will reduce fuel poverty (and by implication actual poverty) and help mitigate the negative impacts of climate change" (ORG_019, Dormont Estate Partnership, 195817732).

ASLEF stated that:

> "Building new homes to the Passivhaus or Scottish equivalent would ensure that Scotland's new homes help the country to build towards a just society for future generations by reducing emissions and cutting fuel costs for residents and thus alleviating fuel poverty" (ORG_005, ASLEF, 196100971).

Some respondents highlighted the wider economic benefits of building to Passivhaus standards. For example, North Ayrshire Council stated:

> "With all new build homes being built to Passivhaus standard, this could create green jobs in the area, new careers in the sustainability, renewables and construction industries including apprenticeships" (ORG_040, North Ayrshire Council, 196410065).

Fife Council agreed that the Bill proposal would make a "significant contribution" towards supporting a sustainable economy (ORG_024, Fife Council, 192234866).

Architects Climate Action Network Scotland added:

> "Passivhaus should help make the economy more sustainable by reducing its vulnerability to spikes in fuel cost. If Passivhaus can be introduced for those on lower incomes, it could be a tool to make society more equal" (ORG_003, Architects Climate Action Network Scotland, 196443628).

Buidheann Tigheadas Loch Aillse Agus An Eilein Sgitheanaich (Lochalsh & Skye Housing Association) argued that Passivhaus or its equivalents are the best option for:

> "being sustainable as communities and as an economy, principally because the measures are not dependent on short term measures or technology change. For most measures and design investment in fabric first has a 60+ year lifespan, unlike say an Air Sourced Heat Pump, with 10-15 years of life in it" (ORG_009, Buidheann Tigheadas Loch Aillse Agus An Eilein Sgitheanaich (Lochalsh & Skye Housing Association), 191612249).

Health benefits of Passivhaus

As mentioned elsewhere in the document (in particular in relation to Question 1), a number of respondents specifically highlighted the health benefits that building to a Passivhaus standard would bring to residents of Passivhaus properties.

For example, Loreburn Housing Association stated:

> "We believe that the Health and Wellbeing benefits of living in a well ventilation and warm will have a substantial impact on people and promote a healthier way of living for our current and future residents" (ORG_035, Loreburn Housing Association, 194623779).

A similar point was made by Stewart and Shields Ltd:

> "The health benefits can also positively impact the strain on the NHS again a benefit to the Government and all of the population" (ORG_052, Stewart and Shields Ltd, 191701696).

Councillor Tom Marshall of North Ayrshire Council stated "Better housing = Better health" (IND_066, Cllr Tom Marshall, 192223300).

Rockwool UK Ltd added:

> "Delivering homes with strong thermal and acoustic performance would have a significant positive impact on the long term physical and mental health and wellbeing of the occupants. Nuisance noise is second only to air quality in terms of the impact on public health and living in cold homes is associated with higher rates of respiratory disease and can impact on educational attainment" (ORG_046, ROCKWOOL UK Ltd, 195829282).

Simon Clark, Constructive Individuals Ltd, highlighted the health and general benefits of the Bill proposal:

> "less energy used, less energy needs to be generated, lower emissions, lower pollution, greater human comfort, better air quality, healthier people. The skills revolution can then be exported to the rest of the UK" (ORG_016, Constructive Individuals Ltd, 196399757).

Alternative viewpoints

Whilst the majority of responses indicated that the proposed Bill would have a positive impact on sustainability, the Hebridean Housing Partnership took a different approach, stating:

> "As stated at the outset we are supportive of the principles behind the bill and these would in all likelihood enhance sustainability. However we do not believe that the bill is the best way forward and could potentially be counter-productive in terms of progress towards sustainability – at least in the short term as the market and industry struggle to adapt" (ORG_026, Hebridean Housing Partnership, 193936577).

In terms of the impact on rural communities, Rural Design Ltd expressed concern about the negative impact of the Bill proposal on rural communities:

> "This continues to erode the viability of the affordability of rural life. Resulting in further reductions in populations as young people in particular cannot find it affordable to establish a life on remote rural areas" (ORG_047, Rural Design Ltd, 192344817).

CALA Group Ltd expressed concern about the impact on the supply chain of requiring that all new builds be built to the Passivhaus standard:

> "Dramatic changes to fabric values to reduce heating demand will have a positive impact to operational carbon but will likely cause a dramatic increase to embodied carbon within buildings. Low carbon highly insulative materials are not widely available currently so the Scottish Government should be looking at other mechanisms to ensure that the embodied carbon of materials are regulated so that the supply chain is

in place for Passivhaus fabric values" (ORG_010, Cala Group Ltd., 196369784).

South Lanarkshire Council stated that work to protect the environment is broader than just decarbonising homes:

> "which is a relatively small contributor to the overall carbon emissions issue. Sustainable, strong and just economies require more than simply reduced costs at the point of use, while action on fuel poverty is a critical issue this must be addressed within a broader approach. Passivhaus has been only a limited contributor to these issues in the 20+ years of its existence and will hopefully be a key contributor to future environmentally sound development proposals. It should not, however, be the sole approach to future housing development" (ORG_051, South Lanarkshire Council, 195699628).

Anderson Bell Christie expressed concern that:

> "the approach will hinder progress with retrofitting existing housing stock. The carbon emitted from existing dwelling operational energy also eclipses that from new build. If additional funds were made available to support the Passivhaus approach, we would prefer to see these diverted to retrofit where they could deliver a significant carbon saving for every pound spent" (ORG_071, Anderson Bell Christie, 196396919).

Michael Laird Architects repeated an argument made elsewhere in the consultation that the Bill should focus on retrofitting:

> "By only focusing on new construction, the bill ignores most of the Greenhouse Gas emissions associated with operating existing buildings. A nationwide programme targeting considerate repair, refurbishment and retrofit solutions is critical in minimising the environmental impact of the built environment" (ORG_038, Michael Laird Architects, 196426164).

ALACHO highlighted that, in respect of health and fuel poverty:

> "Care must be taken around health of tenants/occupiers and the building to ensure that issues with condensation and mould are mitigated. We also need to ensure that the technologies we in our homes for heating and hot water do not cause tenants and especially those who are vulnerable to suffer as a result of fuel poverty. The Bill could mean buying a home is no longer a housing option for some people" (ORG_006, Association of Local Authority Chief Housing Officers (ALACHO), 196436725).

Question 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)?

Three hundred and seventeen respondents (50% of the total) answered this question.

Many responses re-stated comments that were already made elsewhere in the consultation. However, the following additional comments were made by respondents to this question:

- “The Bill needs to at least tee up the prospect of a similar approach to fabric first retrofit across all sectors. Only a tiny fraction of buildings are new, over decades 80%+ of the housing stock at any one time were built before any significant change in standards. It's the start of a journey not the conclusion” (ORG_009, Buidheann Tigheadas Loch Aillse Agus An Eilein Sgitheanaich (Lochalsh & Skye Housing Association), 191612249);

- “The implementation of this bill will have far reaching benefits to society an example being the likely reduction of Child Poverty. This comes about by reducing the fuel bills of poorer families by @ £1,000 per annum” (ORG_052, Stewart and Shields Ltd, 191701696);

- “Make education in Passivhaus mandatory in schools, colleges and university” (ORG_072, Pure Haus ltd, 192517823);

- “Much depends on how effectively the standards are designed and written - so as to be clear for architects and Housebuilders what standards must be followed - and how effectively the standards are monitored and enforced - to avoid backsliding and avoidance” (ORG_028, Highlands & Islands Green Party, 192564813);

- “Government could offer incentives to builders to build Passivhaus houses (such as through land and buildings transaction tax relief)” (ORG_045, Renfrewshire Labour Group, 194520902);

- “homes built to stringent fabric standards such as Passivhaus standards will still have some energy demand for heating and hot water, for lighting and for appliances and other electrical loads and the use of energy for these purposes will also contribute to a household’s energy bills. We think there could therefore be scope to consider how these sources of energy demand could be tackled in the proposed Bill” (ORG_022, Energy Saving Trust, 196146484);

- “Any proposed legislation would have to take careful consideration of the legislation that exists currently relating to Climate Change and development. In addition, future legislation would be required to consider how it relates to:
    - The Town and Country Planning (Scotland) Act 1997 (amended by the 2019 Act)
    - The Heat Networks (Scotland) Act 2021
    - The Climate Change (Scotland) Act 2009

- The Local Heat and Energy Efficiency Strategies (Scotland) Order 2022" (ORG_040, North Ayrshire Council, 196410065);

- "it must be noted that a building that only just meets the Regulations is simply the worst building it is legally permissible to build – raising the standard of the legal minimum for new build construction is the best method of ensuring that the built environment sector limits its contribution to the overall national emissions and energy consumption to an acceptable level" (ORG_043, Paper Igloo Ltd., 192400693);

- "Designing to Passivhaus standards may have an impact on the freedom of aesthetic design and may be particularly challenging for smaller properties to achieve … a monitoring outcome would be beneficial, looking at lessons learned from Post Occupancy Evaluation (POE), for example. This information will contribute to and help educate consumers and industry ... Consideration of natural ventilation options should be included." (ORG_049, SCOTTISH ECOLOGICAL DESIGN ASSOCIATION,196428561)[7];

- "Local authorities are keen to build homes that are energy efficient and zero carbon, however we are not convinced that this needs to be done though the proposed Bill. For local authorities to build to a higher standard such as a Scottish Passivhaus equivalent or enhanced Platinum sustainability standards there would need to be additional funding from Scottish Government to make current development and those in the pipeline viable" (ORG_006, Association of Local Authority Chief Housing Officers (ALACHO), 196436725);

- "We also support the position set out in the consultation that improvements in the energy performance of the built environment may deliver further economic and social benefits in addressing, for example, fuel poverty and health issues. These should not, however be addressed in isolation, for fear of encountering other unintended consequences" (ORG_054, The Royal Incorporation of Architects in Scotland (RIAS), 196277943);

- "There is … a lack of product innovation and huge shortage on skills in the sector. We need to do more to bring through the younger generations into our industry" (NSS_002 Barratt Developments PLC).

[7] The Scottish Ecological Design Association made a number of further comments in relation to this question. The response can be viewed here: https://www.alexrowley.org/wp-content/uploads/2017/12/SCOTTISH-ECOLOGICAL-DESIGN-ASSOCIATION-196428561.pdf

Section 4: Member's Commentary

Alex Rowley MSP has provided the following commentary on the results of the consultation, as summarised in sections 1-3 above.

The purpose of my Member's Bill is to change building standards so that all new build housing in Scotland is required to be built to a Scottish equivalent of the Passivhaus standard, an internationally recognised, tried and tested building method that provides solutions to deliver net zero housing.

I was very pleased to see both the number of responses and support for my bill that the consultation process generated, with 93% of the over 620 respondents being supportive of the bill. I was particularly pleased to see that of the over 70 organisations that responded to the consultation, including business associations, trade unions, environmental groups, and private companies in the industry among others, 84% supported my proposed bill.

I believe this is in part due to people being more aware than ever of the issues of inefficient housing and the increased household energy bills this leads to, the significant increase in fuel prices and the devastating impact of climate change on our planet, all issues that have only become more relevant and concerning since I launched the consultation on my proposed bill. I further believe that so many organisations were supportive of my proposal for a simple reason – it is obvious that these are the steps we need to take to reduce fuel poverty and tackle climate charge in the future and it is crucial we do this sooner rather than later.

With an increase in energy prices throwing many more households than ever before into fuel poverty and looming climate catastrophe that we are not doing enough to avoid; it is essential that we reduce our energy consumption by any means necessary. The UK has some of the most inefficient housing in Europe which leads to higher energy bills, higher energy consumption and more uncomfortable living conditions.

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 along with the removal of the £20 uplift in Universal Credit has created a perfect storm driving more and more people into fuel poverty.

The impact of inefficient housing is already here, and I absolutely recognise the immediate need to retrofit properties to ensure existing housing stock is providing as close to a comfortable and affordable living experience as possible. But for every day we continue building to inefficient standards when better is available, we condemn future generations to the same old retrofitting debate, the same search for funding, the same misery of fuel poverty impacting more households year on year.

I also very much appreciate all of the practical comments on the implementation of this policy, for example the need to pay close attention to

the impact on remote and island communities, the importance of ensuring that the industry and supply chains are prepared for the changes that this proposal will bring about, and the requirement that this proposal fits alongside existing building standards procedures, All of these constructive comments will be very valuable in shaping the specifics of the policy.

So, there is only one way forward – we must break the retrofit cycle. We have the tools, the skills, the experience, the materials, and the method to create Passivhaus homes adhering to the gold standard of energy efficiency, reducing household emissions by 65%. 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.

The benefits of building to the Passivhaus standard are already recognised by local authorities and housing associations. In my constituency, Fife Council are planning the largest passivhaus education facility in Scotland with their new campus in Dunfermline replacing St Columba's and Woodmill high schools which will share facilities with Fife College while Kingdom Housing Association have started construction on a development of 30 affordable new homes for social rent in Gauldry. The reasons for taking the choice to build to this standard is clear – Passivhaus buildings offer a comfortable environment at a fraction of the energy cost of a traditional build by massively reducing the energy consumption required. It is my belief that everyone should have access to homes built to this standard in the future which means building to the Passivhaus standard for all new buildings alongside existing programmes of essential retrofitting for existing buildings.

Scotland has the potential to be a trailblazer in clean, green, comfortable, and affordable housing. I appreciate the Scottish Government's recognition of the problem posed by inefficient housing but unfortunately their proposed solutions don't go far enough. Indeed, by the standards of the Scottish Green Party, a coalition partner in the current Scottish Government, the Government's approach does not go far enough as they pledged to introduce Passivhaus or alternative net-zero standards for all new homes building from 2022 in their 2021 manifesto. If we are to tackle the twin problems of fuel poverty and climate crisis, radical action is required. I believe my Member's Bill is a radical approach to the housing issue, but with tried and tested methodology that means this is entirely achievable if we are willing.

Annexe

Organisational responses (submitted via Smart Survey)

ID NUMBER	NAME OF RESPONDENT	SMART SURVEY ID
ORG_001	Achnacree Homes Ltd	192101463
ORG_002	Andy Duffus, Parkhead Housing Association	194800361
ORG_003	Architects Climate Action Network Scotland	196443628
ORG_004	Architype Ltd	196439702
ORG_005	ASLEF	196100971
ORG_006	Association of Local Authority Chief Housing Officers (ALACHO)	196436725
ORG_007	Bakers, Food and Allied Workers Union	196003031
ORG_008	Bellyeoman Community Council	194173387
ORG_009	Buidheann Tigheadas Loch Aillse Agus An Eilein Sgitheanaich (Lochalsh & Skye Housing Association)	191612249
ORG_010	Cala Group Ltd.	196369784
ORG_011	Castle Roofline Windows and Doors Ltd	192500396
ORG_012	Climate Action Strathaven	193259269
ORG_013	Coast2CoastArchitects	192021144
ORG_014	Dr Keith Baker FRSA – Research Fellow in Fuel Poverty and Energy Policy, Built Environment Asset Management (BEAM) Centre, Glasgow Caledonian University; Co-founder, The Energy Poverty Research initiative; Board Member and Convenor of the Energy Working Group, Common Weal; Dr Ron Mould - Co-founder, The Energy Poverty Research initiative; Member of the Energy Working Group, Common Weal.; Dr Richard Atkins, RIBA, FRIAS, FRSA - Chartered Architect; Scott Restrick - Co-founder, The Energy Poverty Research initiative; Prof Rohinton Emmanuel – Director, Built Environment Asset Management (BEAM) Centre, Glasgow Caledonian University.; Dr Craig Dalzell FRSA – Head of Policy and Research, Common Weal.	194332039
ORG_015	Community Energy Scotland	196103492
ORG_016	Constructive Individuals Ltd	196399757
ORG_017	Craigiebuckler and Seafield Community Council	192617137
ORG_018	Donaldson Timber Systems Limited	196433966
ORG_019	Dormont Estate Partnership	195817732
ORG_020	Dyce and Stoneywood Community Council	192478755
ORG_021	Edinburgh Architectural Association	195990935

ORG_022	Energy Saving Trust	196146484
ORG_023	Fife Communities Climate Action Network CIC	192429660
ORG_024	Fife Council	192234866
ORG_025	Flat Glass Manufacturers' Association (FGMA)	196426810
ORG_026	Hebridean Housing Partnership	193936577
ORG_027	Helical Systems Ltd	195353388
ORG_028	Highlands & Islands Green Party	192564813
ORG_029	Home Energy and Data Services Limited	196351097
ORG_030	Homes For Scotland	196269820
ORG_031	Inverkeithing Trust	192441237
ORG_032	Kirknewton Community Development Trust	193620806
ORG_033	Law Society of Scotland	196343500
ORG_034	Local Authority Building Standards Scotland (LABSS)	195984274
ORG_035	Loreburn Housing Association	194623779
ORG_036	Manor Estates Housing Association Ltd.	196346137
ORG_037	Marchmont & Sciennes Community Council	194216187
ORG_038	Michael Laird Architects	196426164
ORG_039	Noel Wright Architects Ltd	195347582
ORG_040	North Ayrshire Council	196410065
ORG_041	North Lanarkshire Council	196393539
ORG_042	Owens Insight Ltd	196391206
ORG_043	Paper Igloo Ltd.	192400693
ORG_044	Perth & Kinross Branch of Scottish Green Party	191304986
ORG_045	Renfrewshire Labour Group	194520902
ORG_046	ROCKWOOL UK Ltd	195829282
ORG_047	Rural Design Ltd	192344817
ORG_048	Scone & District Community Council	191304008
ORG_049	SCOTTISH ECOLOGICAL DESIGN ASSOCIATION	196428561
ORG_050	Scottish Federation of Housing Associations	196422990
ORG_051	South Lanarkshire Council	195699628
ORG_052	Stewart and Shields Ltd	191701696
ORG_053	Stirling Constituency Labour Party	194113691
ORG_054	The Royal Incorporation of Architects in Scotland (RIAS)	196277943
ORG_055	The Three Kings Cullen Association	194466676
ORG_056	Torphins Community Council	192695972
ORG_057	Transition Black Isle	192622580
ORG_058	UK Passivhaus Trust	190893415
ORG_059	Unite the union Scotland	196401286
ORG_060	WARM Low Energy Building Practice	196392961
ORG_061	West Dunbartonshire Council	192237066
ORG_062	West Lothian Council	196167607
ORG_063	West of Scotland Housing Association	193343147

ORG_064	White Hill Design Studio LLP	195697863
ORG_065	Anonymous	192386123
ORG_066	Anonymous	192504176
ORG_067	Anonymous	193014509
ORG_068	Anonymous	193300772
ORG_069	Anonymous	195473310
ORG_070	Anonymous	195476653
ORG_071	Anderson Bell Christie	196396919
ORG_072	Pure Haus ltd	192517823

Individual Responses (Submitted via Smart Survey)

ID NUMBER	NAME OF RESPONDENT	SMART SURVEY ID
IND_001	Anonymous	191292131
IND_002	Alan Davidson	194122699
IND_003	Alan Gould	195371765
IND_004	Alan Haworth	194176993
IND_005	Alan Hume	194107678
IND_006	Alan L. Archibald	191131984
IND_007	Alasdair Gordon	194217901
IND_008	Alasdair Matheson	195257821
IND_009	Alastair Ramsay Moodie	196306515
IND_010	Aleksandra Dutczak	196391684
IND_011	Alex Brown	192522986
IND_012	Alex Melichar	190650986
IND_013	Alexander Watt	194116184
IND_014	Alison Hutcheson	196198684
IND_015	Alison Jean Lindsay	191074640
IND_016	Alun David Watkins	190830475
IND_017	Alvaro Perez Guardiola	196330466
IND_019	Andrew Arnott	192407412
IND_020	Andrew Blackburn	194102546
IND_021	Andrew Dundas	195345063
IND_022	Andrew Fish	194318089
IND_023	Andrew Pattison	191585744
IND_024	Andrew Rae	194103116
IND_025	Andrew Will	195523426
IND_026	Andrew Younger	194113819
IND_027	Angus Morrison	195430342
IND_028	Angus William Fordyce	195347213
IND_029	Ann G Gaunt RIBA RIAS	191525632

IND_030	Ann Glaister	194246169
IND_031	Anne Lee	194120673
IND_032	Anne Simms	191115432
IND_033	Annette Smart	192232485
IND_034	Anthony Gillespie	194562090
IND_035	Anthony P Hadley	196150245
IND_036	Anthony Seaton	194134223
IND_037	Arthur John Morgan	194122608
IND_038	Arzanish Mansha	195933787
IND_039	Ben Rainger	192176384
IND_040	Ben Twist	194106012
IND_041	Billy Pollock	194786288
IND_042	Bob Shaw	194101798
IND_043	Brian McCabe	193717434
IND_044	Bruce Bennet	194153356
IND_045	Bruce Funnell	195341808
IND_046	Bryan Poole	191213749
IND_047	Carol Freireich	194115999
IND_048	Carol Gallacher	194116082
IND_049	Carol Mochan MSP	196351769
IND_050	Carol Reid	196284058
IND_051	Caroline Higgitt	194109120
IND_052	Charles Brooker	194134644
IND_053	Chris Laing	194111380
IND_054	Chris Runciman	195345062
IND_055	Christopher Pearson	194362505
IND_056	Claire Baker MSP	196403835
IND_057	Clare Philpot	194112545
IND_058	Cllr Alastair Forsyth	192220074
IND_059	Cllr Archie Dryburgh MBE	192291124
IND_060	Cllr Bill Duff	192276006
IND_061	Cllr David Gregg	192591448
IND_062	Cllr G Crowson	192641839
IND_063	Cllr Hannah Powell	192341848
IND_064	Cllr Julie MacDougall	192284905
IND_065	Cllr Paul Henke	192374253
IND_066	Cllr Tom Marshall	192223300
IND_067	Cllr Trish Robertson	192222802
IND_068	Colin Neil Morrison	191287061
IND_069	Colin Smyth MSP	196415774
IND_070	Colm McConnell	194114921
IND_071	Community Councillor for Echt & Skene Community Council	192576722
IND_072	Councillor Alf Kelly	194108661
IND_073	Councillor Andrew Parrott	192225801

IND_074	Councillor Bob Brawn	192294874
IND_075	Councillor Brian Leishman	192499848
IND_076	Councillor David Macdonald	192228469
IND_077	Councillor Gary Robinson	192222897
IND_078	Councillor Janine Rennie	192674771
IND_079	Councillor Janis McDonald	192416397
IND_080	Councillor Willie McEwan	192224853
IND_081	Craig Evans	196259953
IND_082	D Norrie	194152004
IND_083	Daniel Haigh	192528842
IND_084	David A MacKenzie	194119784
IND_085	David Bethune	195412682
IND_086	David Brooke	195409673
IND_087	David Farmer	195876087
IND_088	David Howe	196390008
IND_089	David Hulbert	195668722
IND_090	David Jones	194702452
IND_091	David MacPherson	194118072
IND_092	David Martin Muir	192727921
IND_093	David McCabe	194134433
IND_094	David Roth	194134425
IND_095	David Webster	196384754
IND_096	David William John Forsyth	191194702
IND_097	Declan McGrath	194110344
IND_098	Dennis John Walker	195831764
IND_099	Don Catterall	194117230
IND_100	Donald Hood	192510161
IND_101	Donald Reid	194109567
IND_102	Donald Ross	194104924
IND_103	Donald Wilson	194142941
IND_104	Douglas Blundell	192654560
IND_105	Douglas McFadzean	192243835
IND_106	Dr Eric Goodyer	194115771
IND_107	Dr Gareth Veal	195427443
IND_108	Dr Kate Carter	195383343
IND_109	Dr Malcolm White	196325364
IND_110	Dr Richard Atkins	196235554
IND_111	Dr Tom Flanagan	195074697
IND_112	Dr Alexandra Price	194178201
IND_113	Dr Tom Woolley	190888772
IND_114	Duncan Grassick	194231995
IND_115	Duncan Maclennan	195350808
IND_116	Duncan Tannahill	194115286
IND_117	Ed Parkhouse	194110160

IND_118	Edward A. J. Ferrari	194160938
IND_119	Edward Dymock	192520257
IND_120	Elizabeth Corke	193139382
IND_121	Elizabeth Pattenden	196324695
IND_122	Elrond Burrell	195338876
IND_123	EM Whittaker	195361811
IND_124	Esther Clark	194134899
IND_125	Euan Lochhead	192568467
IND_126	Fay Young	194459232
IND_127	Fionnghal Caldwell	192730778
IND_128	Francis Halligan	196084214
IND_129	Francisco Cerezuela	192535577
IND_130	Frank Musgrave	193698971
IND_131	Frederick Witting	192918203
IND_132	Garry McDonald	194147941
IND_133	Gary Cummins	194256751
IND_134	Gary Wilson	195824727
IND_135	Gemma Grant	194105367
IND_136	George Horne	193246447
IND_137	George Love	194106124
IND_138	George MacDonald	192200895
IND_139	George MacGregor	192324215
IND_140	George Vickers	194107458
IND_141	Gerald Emmans	194116738
IND_142	Gerry McCann	194139672
IND_143	Gillian Wishart	195346415
IND_144	Gordon Ford	194102592
IND_145	Gordon Pryde	196182882
IND_146	Gordon Shaw	194102124
IND_147	Graeme Russell	194202703
IND_148	Graham Acheson	195545622
IND_149	Graham Esson	196183256
IND_150	Graham Golding	194113929
IND_151	Graham Muirhead	194146827
IND_152	Graham Steel	195382139
IND_153	Henrietta Lynch	195815000
IND_154	Hilary K Craig	194128394
IND_155	Howard Schofield	195351994
IND_156	Hugh Brown McClung MBE	191222874
IND_157	Hugh Foy	196002944
IND_158	Iain Fraser	192276384
IND_159	Iain Nethercote	195349458
IND_160	Ian Jarvie	193561645
IND_161	Ian Kelly	194109649

IND_162	Ian Tompkins	192245358
IND_163	Ian van Duivenbode	192563876
IND_164	Isis Reid	196420709
IND_165	Ivor Adams	194103423
IND_166	Jack Oliver Jewsbury	194140884
IND_167	Jackie Baillie MSP	196398258
IND_168	Jackie Carothers	195324590
IND_169	James Holt	196413364
IND_170	James King	195545676
IND_171	James Munro MacKay	195338296
IND_172	James Robb	192147273
IND_173	James York	191676156
IND_174	Jan	191292219
IND_175	Janet McMillan	194121606
IND_176	Janine Rennie	195808342
IND_177	Janusz Knepil	194148327
IND_178	Jenny Penfold	191457958
IND_179	Jim Lindsay	196312683
IND_180	Joan Brown	191223162
IND_181	John Davie Calder	196310470
IND_182	John F Crallan	194186771
IND_183	John Gibson Wrench	194120728
IND_184	John Graham Dunsmore	194134906
IND_185	John Hansen	195810619
IND_186	John Kellett	194178356
IND_187	John Lancaster	195543986
IND_188	John McKee	195342424
IND_189	John McKnight	194114280
IND_190	John Moody	194116127
IND_191	John Padbury	192949478
IND_192	John Palfreyman	192165011
IND_193	John Ruddy	194414808
IND_194	John Stocks	194189133
IND_195	John Thompson	194105429
IND_196	Josh Hamilton	194102782
IND_197	Julia Mountain	196269319
IND_198	Julie Wilson	192097920
IND_199	Juraj Mikurcik	192726640
IND_200	Kasia Lawrence	195350831
IND_201	Katrina Allan	192263234
IND_202	Keith Macdonald	194136140
IND_203	Keith Paterson	195370766
IND_204	Kenneth McEwen	192488524
IND_205	Kenneth McLeod	192239144

IND_206	Kenneth McMurtrie	194103196
IND_207	Kenny Wright	194104516
IND_208	Kyle Henderson	196337023
IND_209	Lawrie West	196362857
IND_210	Leslie Milne	195729886
IND_211	Leslie Morss MA MSc PhD	195514148
IND_212	Lewis Andrew Henry	194102331
IND_213	Linda Graham	195637884
IND_214	Lindsay Hall	192286301
IND_215	Liz Albert	196370332
IND_216	Lizbeth Collie	196087529
IND_217	Lorraine Holmes	196422132
IND_218	Lyn Tett	194475915
IND_219	Lynne Austin	194353842
IND_220	Magdalena Blazusiak	191260824
IND_221	Malcolm Newton	195355695
IND_222	Mandy Cairns	196399316
IND_223	Marcus O'Connell	192004899
IND_224	Margaret Ferguson	194102826
IND_225	Margaret Follon	194362918
IND_226	Margo Lee	194480428
IND_227	Mark Dale	194196743
IND_228	Mark Griffin MSP	196421888
IND_229	Mark Hunter	193563880
IND_230	Mark James Siddall	195339946
IND_231	Mark Phillips	196317838
IND_232	Mark Rivers	194107723
IND_233	Mark Williams	196343132
IND_234	Martin Hinds	194109911
IND_235	Martin MacLennan	194102108
IND_236	Martin Nash	195340035
IND_237	Martin Whitfield MSP	196402348
IND_238	Martine Nolan	194119972
IND_239	Mary Elizabeth Martin	194180052
IND_240	Mary MacCallum Sullivan	192236732
IND_241	Matthew Clubb	196411072
IND_242	Matthew East	195356027
IND_243	Matthew Snedker	195447369
IND_244	Melissa Hart	196400489
IND_245	Melissa Lawson	196392081
IND_246	Mercedes Villalba	196404820
IND_247	Meredith Muirhead	194114506
IND_248	Michael Breslin	196427603
IND_249	Michael Chambers	194686152

IND_250	Michael Hannay	190670859
IND_251	Michael Johnson	194338160
IND_252	Michael Johnston	196336766
IND_253	Michael Morgan	193804793
IND_254	Mick Bird	194121731
IND_255	Mick Woolley	191095994
IND_256	Mike Chandler	194101693
IND_257	Mike Hannay	190669786
IND_258	Milo Gillot	195423152
IND_259	Monica Lennon	195930565
IND_260	Morag Bramwell	196349532
IND_261	Naomi Miles	194203826
IND_262	Neil Cruickshank	194587239
IND_263	Neil Stewart	194433483
IND_264	Nick Hobson	191080485
IND_265	Nick Simpson	191148528
IND_266	Norman Kerr	192939733
IND_267	Oliver Goddard	195428369
IND_268	P M Vallot	192347679
IND_269	Paddy Coffield	192684244
IND_270	Pamela McBain	192485166
IND_271	Paul Bergin	196390499
IND_272	Paul Jackson	192431008
IND_273	Paul McIntosh	195353771
IND_274	Paul Sweeney MSP	196437291
IND_275	Paul Tett	196438249
IND_276	Pauline Cobbold	192617727
IND_277	Peng Lee Yap	194107578
IND_278	Peter Ball	194115903
IND_279	Peter Burke	194107224
IND_280	Peter Drummond	195500699
IND_281	Peter Duffy	194121102
IND_282	Peter Joseph Hall	194105591
IND_283	Peter Travis	192273981
IND_284	Phil Nethercote	195362992
IND_285	Philippe Cortese	195339869
IND_286	Professor Tim Sharpe	191198467
IND_288	Rab Walker	192149062
IND_289	Rachel Mess	195479001
IND_290	Rachel Nunn	192242957
IND_291	Raymond Low	195342331
IND_292	Reuben Singleton	194201384
IND_293	Rhoda Grant MSP	192179673
IND_294	Richard Leonard	196413671

IND_295	Richard Lomas	195667115
IND_296	Richard Simpson	194169370
IND_297	Rick McCluggage	195546275
IND_298	Robert JF McDowell	194103681
IND_299	Robert Parker	192198096
IND_300	Robin Torrie	193302840
IND_301	Rod Holt	195354130
IND_302	Roderick Binns	194130416
IND_303	Roderick Stewart Duncan	196015163
IND_304	Roger Colkett	194125923
IND_305	Roger Humphry	191342345
IND_306	Ronald Page	191205242
IND_307	Rory Kennon	192080484
IND_308	Rosemary Parker	195343378
IND_309	Ross MacKay	196408880
IND_310	Ross Riddocxk	194107977
IND_311	Ross Stewart Imray	194110189
IND_312	Rupert Daly	196382807
IND_313	Ruth McLennan	196274748
IND_314	Ryan Forrester	195996990
IND_315	Sam Baines	194104091
IND_316	Sam Barron	194105896
IND_317	Sam Foster	195839544
IND_318	Samsara McDonald	196292141
IND_319	Sara Dorman	193563255
IND_320	Saz Ali	195357977
IND_321	Seamus Crowe	195361046
IND_322	Sean Austin	194820206
IND_323	Sean Watters	192236641
IND_324	Shaun Laird	194110386
IND_325	Shauna Grant	195600324
IND_326	Simon Corbey	192211864
IND_327	Simon Littlejohn	194182378
IND_328	Simon MacLardie	196399344
IND_329	Sinead Cook	196387942
IND_330	Stanley Charles Cook	194174947
IND_331	Stephen Egan	195867390
IND_332	Stephen Farrar	192560709
IND_333	Stephen John Carroll	194102579
IND_334	Stephen Mitchell	194146721
IND_335	Stephen Morris	194103201
IND_336	Stephen Paul Bramwell	196259122
IND_337	Steve Hickin	194104884
IND_338	Stuart Bretherton	196397701

IND_339	Stuart Dyer	192896969
IND_340	Stuart McAusland	194164172
IND_341	Stuart Rennie	193115976
IND_342	Sue Cowgill	194107741
IND_343	Susan Hillman	194102937
IND_344	Terry Hill	195581252
IND_345	Theresa Hughes	194115070
IND_346	Thomas de la Haye	192230640
IND_347	Thomas Glavin	194226938
IND_348	Thomas Manley	192500152
IND_349	Thomas Taylor	194105760
IND_350	Tim Ingold	194762751
IND_351	Tim Moreby	194145997
IND_352	Tom Barbour	196367380
IND_353	Tom Short	195595093
IND_354	Tony Johnson	194114619
IND_355	Tracy Mulligan	195861572
IND_356	Trevor Swistchew	190823996
IND_357	Vincent Mills	194563492
IND_358	Viviene Moore	195366517
IND_359	Wendy Graham	191452066
IND_360	Wiebke Rietz	196036449
IND_361	William Hay Walker	190767686
IND_362	William Kennedy	194106489
IND_363	Wolfgang Feist	196404410
IND_364	Yvonne McCormack	194103680
IND_365	Anonymous	190581784
IND_366	Anonymous	190583528
IND_367	Anonymous	190632262
IND_368	Anonymous	190650674
IND_369	Anonymous	190688432
IND_370	Anonymous	191074901
IND_371	Anonymous	191188436
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IND_373	Anonymous	191205845
IND_374	Anonymous	191223847
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IND_378	Anonymous	191284440
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IND_380	Anonymous	191418867
IND_381	Anonymous	191422353
IND_382	Anonymous	191573262

IND_383	Anonymous	191776244
IND_384	Anonymous	191850406
IND_385	Anonymous	192062378
IND_386	Anonymous	192164676
IND_387	Anonymous	192194143
IND_388	Anonymous	192199462
IND_389	Anonymous	192226986
IND_390	Anonymous	192234358
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IND_393	Anonymous	192275009
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IND_405	Anonymous	192532579
IND_406	Anonymous	192545261
IND_407	Anonymous	192563703
IND_408	Anonymous	192567489
IND_409	Anonymous	192657977
IND_410	Anonymous	192676000
IND_411	Anonymous	192679035
IND_412	Anonymous	192701314
IND_413	Anonymous	192712598
IND_414	Anonymous	192721440
IND_415	Anonymous	193032527
IND_416	Anonymous	193093821
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IND_418	Anonymous	193484925
IND_419	Anonymous	193781897
IND_420	Anonymous	193994113
IND_421	Anonymous	194103601
IND_422	Anonymous	194103664
IND_423	Anonymous	194104426
IND_424	Anonymous	194104720
IND_425	Anonymous	194106303
IND_426	Anonymous	194107515

IND_427	Anonymous	194107599
IND_428	Anonymous	194108424
IND_429	Anonymous	194109159
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IND_431	Anonymous	194111297
IND_432	Anonymous	194111598
IND_433	Anonymous	194111757
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IND_435	Anonymous	194114328
IND_436	Anonymous	194114496
IND_437	Anonymous	194116201
IND_438	Anonymous	194116946
IND_439	Anonymous	194118809
IND_440	Anonymous	194122286
IND_441	Anonymous	194125643
IND_442	Anonymous	194129472
IND_443	Anonymous	194130827
IND_444	Anonymous	194130845
IND_445	Anonymous	194131340
IND_446	Anonymous	194143989
IND_447	Anonymous	194174688
IND_448	Anonymous	194176333
IND_449	Anonymous	194180518
IND_450	Anonymous	194196320
IND_451	Anonymous	194205756
IND_452	Anonymous	194232962
IND_453	Anonymous	194249951
IND_454	Anonymous	194339428
IND_455	Anonymous	194379751
IND_456	Anonymous	194924734
IND_457	Anonymous	194939545
IND_458	Anonymous	195281494
IND_459	Anonymous	195346673
IND_460	Anonymous	195347736
IND_461	Anonymous	195349487
IND_462	Anonymous	195351639
IND_463	Anonymous	195365099
IND_464	Anonymous	195425342
IND_465	Anonymous	195463087
IND_466	Anonymous	195514387
IND_467	Anonymous	195621809
IND_468	Anonymous	195732783
IND_469	Anonymous	195950710
IND_470	Anonymous	195985707

IND_471	Anonymous	196067898
IND_472	Anonymous	196102153
IND_473	Anonymous	196136255
IND_474	Anonymous	196152307
IND_475	Anonymous	196156676
IND_476	Anonymous	196157374
IND_477	Anonymous	196184165
IND_478	Anonymous	196200272
IND_479	Anonymous	196272279
IND_480	Anonymous	196293771
IND_481	Anonymous	196316861
IND_482	Anonymous	196377487
IND_483	Anonymous	196391329
IND_484	Anonymous	196391784
IND_485	Anonymous	196391885
IND_486	Anonymous	196396874
IND_487	Anonymous	196398430
IND_488	Anonymous	196402773
IND_489	Anonymous	196403198
IND_490	Anonymous	196403834
IND_491	Anonymous	196412715
IND_492	Anonymous	196422770
IND_493	Anonymous	196429898
IND_494	Anonymous	196434782
IND_495	Anonymous	196440818

Non-Smart Survey responses

ID NUMBER	**NAME OF RESPONDENT**
NSS_001	Active House
NSS_002	Barratt Developments PLC
NSS_003	Michael Marra MSP
NSS_004	Stop Climate Chaos Scotland
NSS_005	USDAW
NSS_006	Zero Waste Scotland
NSS_007	Anonymous