Alex Rowley MSP
M1.04
Scottish Parliament
EH99 1SP

27th July 2022

Dear Alex

The Edinburgh Architectural Association (EAA) are submitting a response to the proposed Private Member's Bill, the Domestic Building Environmental Standards (Scotland) Bill. We are generally supportive of the Bill and its ambition to significantly improve the environmental standards of new domestic buildings.

Edinburgh Architectural Association (Chapter of Royal Incorporation of Architects Scotland) has over 1300 members located from the Scottish Borders, through the Lothians to Fife.

The Edinburgh Architectural Association's mission is to create an approachable nucleus of architects and student architects to meet and hold events to stimulate thought and discussion and to share common aspirations. As an organisation, the EAA seeks to form links with other construction and arts-related bodies and to promote the skills and expertise of architects to the public. It aims to represent and support its diverse membership, build connections between architectural practice and education, engage broadly with society to advance good architecture and advocate environmental protection.

The view expressed here have been discussed and agreed following consultation with the EAA Sustainability Working Group and Council members.

We confirm that this response and the name of the organisation and names attached to this submission are able to be published. We also confirm that we have read and understood the Privacy Notice.

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

 Fully supportive

Scotland has set in law a target to be Net Zero by 2045 and some Local Authorities, including Edinburgh, Glasgow and Midlothian, have set even more ambitious targets to be Net Zero by 2030. An ambitious strategy is required to achieve this, especially after the previous target for domestic buildings to be Zero Carbon in 2016 was abandoned following the Global Financial Crisis of 2008.

Domestic buildings were responsible for 18% of UK carbon emissions in 2021 and are increasing even with decarbonisation of energy generation. At the same time the quality of domestic buildings in Scotland and the UK is considered to be the leakiest in Europe, being inefficient to heat in the winter and cool in the summer.
(Department of Business, Energy & Industrial Strategy 2021 UK Greenhouse gas emissions, provisional figures report).

Living in inadequate housing increases the health risk and negatively affects well-being. If the risk is realised there will be costs of medical care, which may vary with the type of treatment. Sickness and disablement will mean that school or workdays are lost, which has an impact on personal income and also economic output.

New analysis by the Building Research Establishment quantifies the annual costs to the NHS of poor quality and hazardous housing at £1.4 billion. This rises to £18.5 billion p.a. when wider societal costs are included (long term care, mental health etc.). *(BRE Cost of Poor Housing report Nov. 2021)*

The proposed Bill is a positive approach to improving the environmental performance of new domestic buildings, to reduce energy demand, carbon emissions, fuel poverty, internal air quality and occupant health.

The energy targets imposed by the Passivhaus standard are more ambitious than the currently proposed changes to Section 6 Energy for both Domestic and Non-Domestic buildings. Adopting the standard will therefore lead to an accelerated reduction in energy demand and associated CO2 emissions. At the same time, the Passivhaus internal comfort criteria and the rigorous certification process are designed to ensure a greater level of occupant comfort and better quality of construction.

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.

However, the Bill currently only applies to new build housing. Meaningfully addressing fuel poverty, nationwide energy demand and carbon emissions will require similar legislation and financial incentives focused on maintaining, repairing and retrofitting the existing vacant[1] and neglected building stock[2]. We support the Scottish Government's position that a 're-use not replace approach should be considered first when dealing with our existing built environment.'[3]

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.**

Yes. 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.

---

[1] Scottish Vacant And Derelict Land Survey 2021 - gov.scot (www.gov.scot)

[2] Households and Dwellings in Scotland, 2021 | National Records of Scotland (nrscotland.gov.uk)

3 https://www.gov.scot/publications/creating-places-policy-statement-architecture-place-scotland/pages/1/

Ambitious voluntary energy targets already exist and some developers, housing associations and local authorities have adopted these and have shown that they can be achieved. Most notably is the Goldsmith Street Social Housing development in Norwich, which was built to Passivhaus standard and has won the 2019 RIBA Stirling Prize.

Taking the additional step by introducing the Passivhaus standard, or Scottish equivalent based on the Passivhaus performance targets into legislation will ensure a level playing field for designers, developers and contractors, accelerate upskilling within the industry and will ultimately reduce capital costs associated with delivering low energy buildings.

Financial incentives and /or tax benefits may enable the transition period until the Passivhaus standard becomes legislation.

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.

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

The Passivhaus standard is 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.

The Passivhaus standard is an internationally recognised standard for designing and delivering low energy buildings. The standard has been designed for use within the varying climates of different countries. As such, we do not believe a specific Scottish version should necessarily be created. This would also allow for earlier implementation of the proposal and enable the necessary training to be undertaken based on the existing Passivhaus standard.

However, if the existing legislative structures for Building Regulations and the Technical Standards restrict the adoption of the Passivhaus Standard, then the creation of a Scottish equivalent based on the performance targets could be an option, ideally in partnership with the Passive House Trust.

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?**

◉ Partially supportive

The Passivhaus standard is primarily focused on operational energy, whilst not setting any embodied carbon targets, although it is the very effective in reducing emissions in new build housing due to the low energy targets embedded into the standard.

A more impactful legislation proposal would require Whole Life Carbon assessments to be carried out and would include limiting targets for upfront, embodied, operational, territorial and offshore, as per the RICS lifecycle stages A, B, C, D in RICS Guidance Note "Whole Life Carbon Assessment for the Built Environment 1st Edition, November 2017" [4]

Further legislation to cover Embodied Carbon and the Circular Economy along with decarbonising the energy grid will provide a holistic approach to reducing carbon emissions in buildings and wider society. This is especially important with additional pressure being placed on the energy grid as other areas decarbonise and switch from other fuel sources to zero carbon energy.

For clarity, the "*'Embodied Carbon' emissions of an asset are the total Greenhouse Gas emissions and removals associated with materials and construction processes throughout the whole life cycle of that asset*.[5]" These include *"the processes associated with sourcing materials, fabricating them into products and systems, transporting them to site and assembling them into a building. They also include the emissions due to maintenance, repair and replacement, as well as final demolition and disposal."*[6]

5. **Which of the following best expresses your view of the process set out to ensure that the new standards are met in all new build housing? (see pages 14 to 16 in the consultation document)**

◉ Partially supportive

Design Process:

In our view, the process outlined on pages 14-16 is slightly misleading. The process requires to be better defined. It currently does not follow the steps of the typical sequence of the design and construction of buildings.

There needs to be space in the process to allow for the project to be assessed against the Passivhaus criteria before construction, to ensure viability of the design as this is the most cost-effective approach. Additionally, the proposals should have Building Warrant approval in place before the construction stage to align with the current practice in Scotland.

We agree that introducing the additional verification processes required by Passivhaus will help to ensure a reduction in the performance gap and is an important new step to reducing in use carbon emissions in new buildings.

---

https://www.rics.org/globalassets/rics-website/media/news/whole-life-carbon-assessment-for-the--built-environment-november-2017.pdf

[5] LETI, Carbon Definitions for the Built Environment, Buildings and Infrastructure, 2021

[6] RIBA, RIBA Sustainable Outcomes Guide, 2019, p. 29

In our view, the PHPP is indeed an accurate tool for assessing in-use performance of the heating, cooling, ventilation, and hot water systems. However, future energy targets should include predicted total energy usage, both regulated and unregulated energy.

Passivhaus Certifiers:

Given the extent of current workload on the Local Authority Planning and Building Standards Departments, we suggest it would be best to use the approved Passivhaus Certifiers similar to the SER certification approach within the Building Warrant process which uses approved designers and certifiers.

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

Market impact on existing properties

The introduction of an ambitious target such as Passivhaus for new Domestic Buildings could enable the development of a retrofit market as occupiers and owners seek to improve the energy efficiency and climate impact of their homes. In addition, in order to achieve its Net Zero targets, the Scottish Government should put in place mechanisms that will facilitate an ambitious maintenance, repair, retrofit and reuse strategy for existing housing stock.

We see Passisvhaus for all new build as part of a 3-step process to make the whole building construction, operation and deconstruction process net zero. **Step 1** is the decarbonisation of the construction sector. This will focus the industry, and allow **Step 2**, mass maintenance and repair of the vacant (and often) neglected buildings and the low energy retrofit of existing building stock. **Step 3** is Whole Life Carbon (WLC) Assessments to include all stages of material/buildings life and the reuse economy to ultimately set targets to reduce construction related embodied carbon.

Skills and knowledge:

Concerns around lack of necessary skills, for both designers and contractors, are real. However, we believe that the answer is to accelerate the upskilling of everyone in the industry, and not to slow down legislative measures that could meaningfully address the climate emergency, fuel poverty and the comfort standards of building users. In addition, having the skills and knowledge to deliver better homes, will most likely increase the professional satisfaction of those working in the built environment and encourage a wider range of people from a variety of backgrounds into the industry.

There will be a potential market bonus from industry training arising from the certainty of the legislation. Construction trainees, professional designers and certifiers will be empowered to develop the necessary knowledge and skills helping to achieve the Scottish Government ambition of creating a highly skilled and high paid workforce.

Supply chain readiness:

The increased demand for building elements (e.g. Windows & off-site manufacturing) and equipment that satisfy the Passivhaus criteria could have both positive and negative impacts on material supply chains. Without careful management and sufficient notice that will allow manufacturers and suppliers to adapt, this could lead to additional supply chain challenges. However, with a carefully thought-out implementation process, the Bill could create the environment to expand construction and manufacturing opportunities within Scotland improving business productivity and economic prosperity, especially if it works in a joined-up manner with the Circular Economy Bill.

Key to the success of Step 3 mentioned above is that Whole Life Carbon Assessments (WLCA) will enable access to local, renewable, repairable, reusable manufactured products and materials, possibly led by Zero Waste Scotland. Passivhaus and WLCA will be the demand that the local economy requires. The Passivhaus Standards allows a chain of control that can be applied to the Life Cycle Assessment/Environmental Product Declaration of products and materials. The products and materials used should include a prescriptive method of maintenance during their first life and deconstruction for reuse at the end of their first life.

Construction programme:

Adopting the Passivhaus standard will have an initial impact on design and construction programmes - but the exact extent of this impact will depend on the implementation process. The additional time associated with a more detailed design assessment (PHPP as opposed to SAP) and the certification of the building will diminish as the industry becomes more familiar with the standard.

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?**

 some increase in costs

Capital Costs

There will be initial increased capital costs associated with designing and constructing new domestic buildings to Passivhaus standard as the market adjusts from the current business as usual and the skills gap is bridged and new supply chains are established.

Although the additional capital costs will vary from project to project, they were estimated to be around 8% in 2019 and expected to fall to 4%[7], as the standard becomes more widely adopted.

Operational Costs

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

The energy efficiency of buildings designed to the Passivhaus standard results in significantly reduced energy costs when compared with current typical domestic buildings helping to reduce fuel poverty. In a landscape dominated by volatile energy prices, minimising building running costs becomes very appealing.

Whole life cycle costs

Whilst the upfront budget is indeed very important, to evaluate the full building costs, an assessment of the life cycle costs & life cycle value will have to be carried out.
Such a holistic cost analysis will have to compare capital costs with the savings achieved through lower energy bills, maintenance costs and other benefits such as the ability to obtain lower rate green finance.

The industry is seeking a regenerative approach to construction, but this will only fully develop with legislative support from the Scottish Government. This must be based on a Triple Bottom Line analysis of People, Place and Planet, and Whole Life Carbon Assessment. The Scottish Government must make it mandatory for the construction industry to 'value' all activities on a triple bottom line basis; people, prosperity, planet. This will quantify that nothing is 'cheap', and everything comes with a 'cost.'

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?

   Please explain the reasons for your answer and if there are any ways you think the proposal could avoid negative impacts on particular people.

As this bill applies to new construction only, it will positively impact those moving into new homes built to the Passivhaus standard. This bill will not improve the living conditions of families in existing housing stock experiencing fuel poverty due to the poor energy efficiency.

Unless meaningful action is taken to improve the energy performance of existing buildings, there is a risk to create greater inequalities between those living in new Passivhaus homes and those continuing to inhabit current buildings. A maintenance, repair and retrofit strategy should be mandated to upgrade existing housing[8] and neglected vacant[9] buildings.

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.**

[8] Households and Dwellings in Scotland, 2021 | National Records of Scotland (nrscotland.gov.uk)

[9] Scottish Vacant And Derelict Land Survey 2021 - gov.scot (www.gov.scot)

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?

The new Bill would have a positive impact protecting and enhancing the environment, helping to develop a sustainable economy and a strong, healthy and just society for future generations. The improvement of domestic buildings from the leakiest in Europe to the best in Europe will reduce energy demand and help reduce fuel poverty for occupants, helping low-income families to afford to heat their homes and not have to choose between heating and eating as is happening in the current energy crisis and cost of living crisis.

Passivhaus buildings use significantly less energy than 'standard' properties, reducing both carbon emissions and helping to meet national climate change targets and help to keep average temperature increases below 1.5degrees. The design approach of Passivhaus to control solar gains and reduce overheating will also help to regulate internal temperatures, the importance of which is highlighted by heatwaves across Scotland and the UK in recent years.

The design principles used in Passivhaus improve the internal air quality, the health of the occupants and consequently reduce sickness and demand on Health Services, creating a healthier and just society.

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)?**

We need to see a dramatic reduction in energy use associated with our buildings, both Domestic and Non-domestic in our existing stock and buildings to be constructed. The Bill is an ambitious step towards achieving significantly lower carbon emissions associated with the built environment, ensuring that the energy demand is reduced as much as possible and bridging the performance gap.

Ultimately, we need to ensure that all new buildings, Domestic and Non-Domestic are environmentally benign, Net Zero or beyond. Legislating Passivhaus can help move towards that goal. We hope this will give the industry time to grow the Reuse Economy for new and existing buildings. We see Passisvhaus for all new build as Step 1. This will focus the industry, and allow Step 2, mass maintenance and repair of the existing building stock. Step 3, Whole Life Carbon Assessments, Material Passports and Build Passports to include all stages of material/buildings life and the reuse economy should develop with the adoption of the Circular Economy Bill to move towards the decarbonisation of the whole construction industry and achieving the Net Zero target of the Scottish Government by 2045.

By only focusing on new construction, the bill ignores most of the Greenhouse Gas emissions associated with operating existing homes. As 80% of existing buildings will still be in use in 2050, a nationwide programme targeting considerate maintenance, repair, refurbishment and retrofit solutions is critical in minimising the environmental impact of the built environment.

our existing UK building stock, we see:

- *It currently produces 27% of our carbon emissions with 18% alone coming from our homes.*
- *It is not fit for purpose with 3.3 million households living in fuel poverty.*
- *It consists of millions of poor-quality buildings, which have a detrimental impact on our health. It is not optimised for a decarbonised grid.*

By contrast, high quality deep retrofits deliver:

- *Reduced fuel bills, addressing fuel poverty Improved health and wellbeing outcomes.*
- *Buildings optimised for a decarbonised grid (with energy consumption issues addressed 'at source', i.e. at point of building, therefore reducing impact on wider utilities infrastructure).*
- *Reduced carbon emissions.*
- *Reduced demand for renewable energy.*
- *Reduced peak load.*

This Bill is focused purely on minimising operational energy demand and the associated carbon emissions. However, as the energy demand decreases and as the production of energy is decarbonising, the emissions associated with constructing, maintaining, and disposing of a building at the end of its life become more significant. These emissions, also known as embodied carbon, can represent 40-70% of Whole Life Carbon in a new building.[10]

In our view, any new legislation or iteration of the building standards will have to address the embodied carbon emissions, in addition to limiting operational energy demand. This should be addressed as soon as possible to tackle the Climate Emergency.

Passivhaus is a performance-based approach to designing buildings that sets ambitious energy use targets. It is not prescriptive in the approach of how the designer achieves the targets but focuses the efforts to reduce energy demand associated with the operation of buildings. It improves indoor air quality and reduces heat losses, improving indoor comfort levels, which is increasingly important as average temperatures increase in Scotland, the UK and Globally.

We recognise that there are other potential approaches to reducing operational carbon emissions in buildings, including, a natural ventilation approach. There might be a mechanism within the Bill to allow for this approach to achieve the Passivhaus energy targets outside the PHPP methodology. This would require further investigation to determine how this could be addressed

[10] LETI, Embodied Carbon Primer, 2020, p.18

The EAA welcomes the development of a proposal to significantly reduce the emissions associated with Domestic Buildings and hopes that the lessons learnt can be applied to existing and non-Domestic buildings in the future to decarbonise the entire building stock within Scotland.

Yours Faithfully

Jo McClelland

On behalf of the Edinburgh Architectural Association.

Joanne McClelland (EAA President, EAA Council & EAA Sustainability Group)
Ben Rainger (EAA Past President, EAA Council & EAA Sustainability Group)
Mariana Novosivschei (EAA Council & Sustainability Group)
Alex Liddell (EAA Sustainability Group)