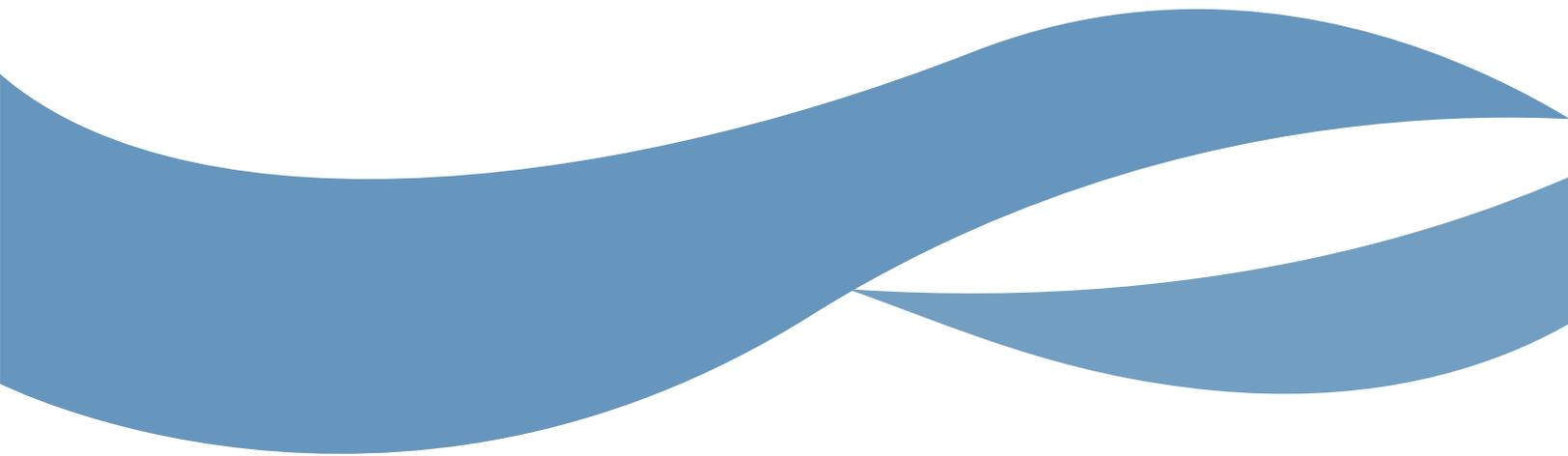


New Build Heat Standard: Scoping Consultation

03-03-2021

About Scottish Land & Estates

At Scottish Land & Estates (SLE) our work helps to ensure that rural Scotland thrives. We are a membership organisation for landowners, rural businesses, and rural professionals. We promote the wide range of benefits land-based businesses provide: tourist attractions, leisure facilities and landscapes enjoyed by the public, as well as housing, employment, tourism & enterprise and farming opportunities. We represent the interests of our members and wider rural Scotland to the UK and Scottish Governments to help ensure that policy and legislation reflects the unique requirements of rural Scotland and its communities.



Introduction

SLE cautiously welcomes the Scottish Government's vision for delivering heating requirements for new buildings. We agree that it is essential a plan is put in place to ensure new development does not contribute to carbon emissions, and that this should be done as soon as is practicable. We also agree that it should be a Standard that is effective, practical and fit for purpose – particularly in a rural context where developments may not have access to particular heating technologies, such as heat networks or low-cost fuel networks such as mains gas.

We welcome recognition that a more nuanced/phased approach to non-domestic buildings is required. And we consider that this should be done in line with the principles of the Just Transition. It is our view that greater consideration needs to be given to the potential unintended impacts that such a standard might have on smaller developers operating in rural Scotland.

Many of our members are at the forefront of delivering low-carbon energy efficient homes in a rural context, some examples can be found [here](#). We would welcome further engagement should Scottish Government wish to know more about our members' work in this area.

1. Do you agree with the above key outcomes? Please explain your view.

Outcome 1: Yes, we are supportive of this. It is crucial that we remember the rural context and are therefore not too prescriptive with regards to the type of heating systems that can be used to achieve said Standard. Although the outcome relates to heat, we consider it would be remiss not to mention the embodied energy involved in the process of construction - the materials used should lock up carbon as much as possible to create opportunities for a circular economy. For example, a number of our members have used woodfibre insulation from sustainably managed forests rather than fossil fuel based polyurethane e.g. Kingspan.

Outcome 2: Welcome this. Good design will also reduce energy requirements for heating and cooling buildings, but also include appropriate ventilation systems. There will also need to be support and awareness raising to stimulate changes in behaviour.

Outcome 3: Welcome the outcome of affordable non-carbon energy. In rural areas, beyond the reach of mains gas, electricity is likely to be a major source of de-carbonised energy. Many renewable forms of energy are produced in rural areas. Generation of energy from wind-turbines, solar fields and even small hydro schemes makes sense to serve rural communities. However, rural areas are not seeing the benefits of having these major energy producers in their local areas. The major problem at the moment is the distribution and Ofgem pricing system. In most cases where the market is numerous small consumers (e.g. rural communities and small businesses) the mains electricity network is the logical route of distribution of this green energy. However, the moment this cheap electricity enters the mains electricity network the distribution companies add a disproportionate cost, often trebling the price, making the electricity less affordable. This is even though the customers in rural areas would have lower electricity distribution losses (efficiency losses) because they are closer to production. Solution: a better balance

needs to be established between the generators of electricity and the distributors. A better share for the distributors will increase supply which will put downward pressure on the cost.

The paper talks of 'using the evidence available to us to determine the most cost-effective systems in different areas of Scotland'. The evidence of experience shows that Scottish Government must take cognisance of regional differences – e.g. between rural and urban Scotland. A one-size fits all approach cannot be applied in this instance.

Outcome 4: We welcome this. It might also be worth noting that diversified use of energy technologies can reduce reliance on one technology and help build resilience in communities. The systems in a new build that give the greatest contribution to reducing energy use are related to insulation, ventilation and energy conservation. It is crucial that these elements are installed properly or the end result will be unhealthy buildings and occupants.

Outcome 5: This is absolutely essential or the end result will be unhealthy buildings and occupants. The current capacity in Scotland to deliver the necessary level of training to all – from architects through to the building workforce – is minimal. It will be necessary to invest in the provision of greatly increased training capacity. At the moment we are concerned that the likelihood of having an upskilled trained supply chain to deliver new builds by 2024 are minimal.

Outcome 6: Welcome recognition of this, however the importance of outcome 6 should not be underestimated. In our view it will require considerable effort to achieve informed, educated consumers about the concept of zero carbon within three years. The problem lies not only in having an awareness about the proposed changes but also about how people will have to change the way they actually behave in their own homes and their lives if we are to achieve the proposed goals.

There seems to be little recognition of the Rebound Effect whereby human behaviour changes with energy efficiency improvements so that a percentage of the putative gains are lost.

Examples include:

- People living in better insulated houses tend to wear fewer clothes indoors and therefore need a warmer home than if they wore warmer clothes that they used to wear before the building was better insulated/heated. Potential energy saving lost.
- With low energy LED lighting people tend to leave lights on more frequently because they use so little energy. Previously they would switch them off more frequently. Potential energy saving lost.
- People drying clothes inside the house rather than outside. Creates moisture which in a low ventilation environment leads to mould which can harm both building and health of occupants.

Outcome 7: Welcome this. But it should be noted that one of the recommendations for dealing with Covid-19, for example, is to open the windows which will certainly reduce the desk-based calculations of energy use, efficiency and carbon emissions.

Outcome 8: Welcome this. Smart technology must work alongside behaviour change if it is to achieve maximum effectiveness.

Outcome 9: Welcome this. The Standard should not impact the supply of homes and non-domestic buildings.

2. Are there any additional outcomes which should be embedded here?

The higher specification and therefore more expensive zero carbon homes, along with planning requirements, higher building standards and consent costs, will mean that the building and selling of homes in small schemes in rural areas could become unaffordable. A systemic review of all costs in building houses compared to known selling price points is therefore required, with a view of making the process of building houses for sale or rent more affordable.

3. Do you agree with limiting this Standard to 'new buildings' as defined within section 2.2?

While we agree that any property built for the first time should be covered by such a Standard, we do not agree that it should apply to any property created by conversion of an existing building. The experience of SLE members in converting traditional rural buildings often shows that modern standards cannot always be applied like-for-like. For example, applying the new build energy efficiency standards to thick stone walls would be extremely costly and potentially render an already small living space (as many traditional properties can be) even smaller due to requirements for insulation. This may lead to traditional buildings not being converted, potentially negatively impacting the supply of affordable housing in rural areas.

There is also the whole problem of using the EER measure, rather than the EI measure within EPCs to rate a building's energy efficiency. The EER measure is driven by the cost of energy rather than by carbon emissions.

The emphasis on the EER measure, driven by the dominance of fuel poverty policy making owners install systems that increase carbon output, rather than reduce it. Such installations, encouraged by the present system, will themselves have to be replaced if zero-carbon targets be met. The energy involved in manufacturing, transporting and replacing systems should be taken into account. It is vital and urgent that the present set of policies are re-balanced to give more emphasis to the EI measure within the EPC system so that such illogical outcomes are eliminated.

The definition of a new building to include conversions will cause havoc with many pre-1919 breathable buildings which have to have a balanced thermal envelope and not create "cold spots" or "thermal bridging". It is at the points of large thermal changes between different parts of buildings, one with higher insulation than another part, that condensation, damp, mould and rot occurs. Water vapour will always condense on the cooler surface. There are also recognized maximum insulation, and consequent lowest safe "U" value for retrofitting many older buildings, for example, a "U" value of 0.45 is considered the lowest safe "U" value for a 500mm stone wall.

Conversely the embodied energy is much higher in an existing building and there are less carbon emissions retrofitting an existing building than building a new one. This means that an adjustment is needed in the Scottish Government policy to re-balance the EPC requirements putting more emphasis on the EI measure and less on the EER measure. This would allow the builder and the purchaser to choose a low carbon emissions option even if it might be more expensive. Other policy mechanisms are therefore needed to support people in fuel poverty and less CO2 emissions reductions should be expected from ever higher specifications for the buildings.

4. Do you agree with: (a) our approach taken to require future installed heating systems to be zero direct emissions only, and (b) our approach taken to focus on direct/point of use emissions that a building owner has responsibility over only?

- (a) For brand new buildings this approach is appropriate, however, we revert to our comments for question 3 relating to embodied energy of conversions in existing buildings. It may be appropriate to ensure that emissions produced throughout the lifetime of the building should also be considered in the scope of the Standard as this will ensure lasting CO2 emissions benefits e.g. the use of natural carbon sequestering products like woodfibre are prioritized in construction. We also consider that the sustainability of construction, maintenance and demolition should be at the very least referenced in this Standard. The Forest Industries in the UK and in many other parts of Europe and the world have adopted woodland assurance schemes such as FSC or PEFC, to ensure sustainable forest management.
- (b) This direct point of use seems reasonable, however our previous points about embodied energy still stand. In relation to responsibility, it might be appropriate for a more even-handed approach which considers responsibility for developers, designers, specifiers and owners – plus good consumer protection legislation backed up by professional indemnity insurance. In our view this will lead to higher build standards as more people retain responsibility in the longer-term.

2.5 mentions connecting new buildings to new or existing heat networks. In much of rural Scotland this will not be viable owing to the cost and heat losses connected with heat networks in less-densely populated areas. Rural properties often have the space to adopt a variety of the bulkier heating systems e.g. ground/air-sourced heat pumps, solar panels, electricity and heat batteries etc. Building policies in rural areas should be made more flexible and easier, for example a General Development Order that supports renewables where they contribute to the development of zero carbon properties.

In addition, if the gas grid is used to distribute green Hydrogen gas rather than methane then there is no logic in having a policy that new houses should not be connected to the gas grid.

5. What evidence can you offer on ways of ensuring zero direct emissions from heating that could be compliant with this Standard?

As a membership organization, we direct you to the work of our members which can be accessed [here](#).

Retaining the existing methodology of EPCs would perpetuate a system which is not fit for purpose for traditionally built housing and affordable housing provision. A better system is urgently required not only for new build but also for making existing housing compliant with low/zero carbon targets.

6. What are your views on section 2.6, specifically regarding what mechanism the Scottish Government could use to ensure compliance with the Standard?

In our view creating an easily understood and enforceable stipulation about the types of heating systems that would be permissible under the new Standard would probably be the easiest to implement. However, we consider it important to re-emphasize that rural areas have different options than urban areas, so a “one-size-fits-all policy” will be detrimental. A different set of policy approaches that encourages the highest levels of adoption of zero CO2 technologies by property owners should be taken forward. In addition, if this approach is taken there will need to be an element of flexibility built in to ensure that new, potentially more efficient, technologies can be accommodated in the future. And the system should be able to accept local solutions – such as houses which have an adjacent hydro plant should be able to have their EPC adjusted to take that into account.

7. What steps can the Scottish Government take to support industry to deliver this Standard, and how could we make compliance with this Standard easier?

Where upfront capital costs to deliver particular technologies are prohibitively expensive Scottish Government should consider adding a heat standard weighting to the rural and islands housing funds.

As we have mentioned already, the Scottish Government needs to markedly increase training so that the building trade, across its whole scope, understands the subject and can install technology without creating dangerous downstream problems such as poorly ventilated buildings creating health problems for occupants.

8. How do we ensure that consumers are protected from increased energy bills, while giving developers flexibility to comply with the Standard?

Green electricity is going to be in great demand. Supply for rural communities can be increased by local generation using isolated wind-turbines, small scale hydro and solar fields. The output can be delivered in two main ways – via the mains grid to local consumers, and converted into fuels such as hydrogen, or liquid NH3. Also, batteries, both heat and electricity batteries. It is imperative that local electricity generators are given access to the mains grid without the electricity companies trebling and more the cost of electricity. Local generators should be paid more, electricity companies should be limited to doubling the cost to them. Increased local production should lower cost of power.

9. What are your views on new buildings connecting to an existing heat network, where development takes place within a heat network zone? Do you envisage any unintended consequences as a result of this proposal?

Arguably, the proposal only makes sense where a new development will contribute to the critical mass which will make the heat network viable. It therefore does not seem appropriate for a small development of a few houses in a rural location to be required to meet this specification, particularly if they are separated from a viable number of other buildings by a significant distance, a designation, or any other means that would make it impractical for those houses to connect. In such circumstances the use of other technologies such as ground/air source heat pumps or Passivhaus should be considered.

Each situation is likely to be different with a variety of technical and economic constraints built into the design of each system. For example, a lot of careful thought is put into the capacity of a system before it is installed, as spare unused capacity is likely to entail higher equipment costs and a lower rate of return to the investors. The investors are both the heat entrepreneur and the funders (banks). Capital has costs e.g. facility fee from a bank to support a loan, and banks have to respond to their regulators about the amount of capital that has to be placed on their balance sheets to support each loan and their loan portfolio.

10. Do you agree with the Scottish Government's proposal to introduce this Standard in 2024? What are your views on this Standard being brought into force for new buildings consented earlier than 2024?

This is perhaps optimistic and will depend, in part, on the implementation of the Heat Networks (Scotland) Act 2021 and local authorities' / Scottish Ministers ability to designate Heat Network Zones. But perhaps more importantly, we also consider the chances of having a suitable training system to bring the whole building trade, from architects to tradespeople, up to this new standard in 3 years are very slim. Related to this issue is the massive effort required to educate and inform householders how to live in a zero carbon age.

In our view it would not be appropriate to implement this Standard to buildings consented before 2024. Many developments consented before then, particularly in rural areas, will have been brought forward having managed to resolve a number of complex issues and introducing further costs and complexity could potentially impact viability.

11. How can opportunities be maximized for the supply chain involved in the delivery of new homes (ranging from product suppliers to on-site operatives), including skills?

Skill development must include Board level and extend, like a thread, right throughout the organisation. This will take time and this time can be usefully spent maximising the product supply chain. The current capacity to train people properly to retrofit insulation into traditional buildings in Scotland is probably under 100 places a year. This is indicative of the scale of challenge we face.

12. What do you envisage the key challenges would be for developers, and wider-building industry, in meeting this proposed Standard? How could this sector be supported to address those challenges?

The lack of appropriate training and knowledge in all building sectors from architects onwards is a key challenge. Support should come from Skills Development Scotland and Construction Scotland Innovation Centre and examples of good practice used to overcome any doubts.

The vast majority of the workforce in 10 years time, are already in work now. There needs to be much more emphasis on “lifelong learning”, CPD, requirements for new training and certification etc. Our understanding is that at the moment some 90% of training in the building industry from architects to tradespeople is on modern methods of construction and modern materials, at least 50% of the workload is in refurbishing & retrofitting existing buildings. There are a high proportion of pre-1919 stone wall / slate roof, breathable buildings – that need very, very different methods and materials, and training and certification etc. In these buildings, the key role is the designer and specifier, these people need to be highly trained to get it right for all situations.

13. What are the key challenges for the energy networks regarding the deployment of zero emissions heating in new developments? How could this sector be supported to address those challenges?

Upfront capital costs may prove problematic for development in rural marginal sites.

Green electricity is going to be the go-to choice for many new buildings. When coupled with the growing demand for green electricity for transport this points towards a significant problem in providing sufficient green electricity and sufficient capacity in the electricity distribution system, including at the local transformer level – who pays for the local upgrades of systems? It’s not just the major parts of the electricity distribution system that needs more capacity it’s everywhere, from individual houses, local transformers, local cabling etc. etc. The task is considerable and raises the question, do we have enough electrical technicians and engineers especially given the phasing out of nuclear and fossil fuel generation that’s ongoing.

See also our answer to question 8.

14. How do you see this Standard interacting with wider-energy system changes, and what role do you see for flexibility and smart technologies?

There must be flexibility within the Standard for new technologies which might impact their adoption and use in the future. For example, if Green Hydrogen were to be pumped through the gas grid then the rule that prohibits new connections to the gas grid would be counterintuitive.

15. What can be done to encourage greater consumer awareness and understanding?

This should be through a deliberate campaign of advertising to ensure people buying homes are aware of the new Standard and online workshops for developers etc., who will be expected to understand and implement the Standard.

Education of the consumer is critical using examples of what has been built and the savings that have been made already. The role of Registered Social Landlords is critical in this respect. At present energy saving is not high on consumers' agenda and this must be raised.

Our members' experience of working with EPCs for many years is that prospective tenants show little interest in the EPC rating. Encouragement to buy EPC A-rated homes, for example, can be achieved through the Council Tax system and by post-sale engagement with the developer.

16. What approach should be taken when considering new non-domestic buildings, and what are the specific challenges and opportunities relating to new non-domestic buildings?

There are a significant variety of non-domestic buildings which could be covered under this section. As such, there will be difficulty in prescribing a single Standard to apply to all these buildings. Additionally, the cost of buildings compared to what the market can afford should be considered so that industries are not priced out of the market. This can be done as part of the systematic review of costs we have suggested under question 2.

17. By introducing this Standard, what challenges or opportunities might result for households on low incomes (for example, around affordability or access), and how can the Scottish Government best take account of these?

Other policy drivers that address fuel poverty should be introduced and not push building standards so high that nobody can afford to build and use those buildings. Productivity, risks and costs should be kept under constant review, Coronavirus has had major short and long term impacts on the commercial sector, for example.

For more detailed information

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