

Submitted to New build heat standard consultation: part II
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Consultation questions: approach to regulation

1 Do you agree with the approach set out in 2.1 to regulate direct emissions heating (DEH) systems in new buildings?

Don't know

2 Do you envisage any unintended consequences as a result of this approach?

Yes

Please provide reasons for your answer:

The Scottish Government should ensure that its energy performance standards for all homes and buildings recognise the carbon benefit of exported solar power from onsite generation and include solar PV in its “notional house”.

Yes, we envisage major unintended consequences. The introduction of the New Build Heat Standard removes solar PV from the notional dwelling specification in Scottish Building Regulations for the first time since 2015. This is completely counterproductive. It could destroy the thriving new build rooftop solar industry in Scotland, which has delivered jobs, clean growth, and made a significant contribution to the decarbonisation of the Scottish new build home sector. It would also directly increase energy bills, which new build homeowners would be obliged to pay. This is a foreseeable outcome of the Standard as currently proposed, as we describe below.

While developers have the choice of gas and heat pumps, it has been necessary to loosen the specification for heat pump heated homes to level the cost playing field with gas heated homes, because gas boilers have a lower capital cost than heat pumps. Although the New Build Heat Standard requires Zero Direct Emission Heating (ZDEH), the only mandatory notional house technology specification that will apply, according to the building regulations, is the inclusion of a heat pump. However, there is no specification for onsite generation, such as solar.

This introduces a major risk of the decarbonisation of new build home heat coming, literally, at the expense of an increase in bills. New homes heated with heat pumps will be more expensive to run than the gas plus solar specification. This will particularly be the case given the uncertain long-term projections for energy prices. The impact of this has been evident in 2022, as the volatility of the international gas price has fed into catastrophic price increases for consumer and business energy bills. Indeed, they have been so high that the Westminster government has been forced to make an unprecedented market intervention to cap prices for consumer. In light of this, it is highly concerning that the draft new Scottish Standard does not recognise the importance of designing affordability into new buildings.

This situation has arisen because the impact assessment for the building regulations only considered gas plus solar on the notional house. But the interaction of the heating standard with the building regulations was not assessed for the energy bills of residents. We cannot stress enough that unless solar is added to the heat pump notional house specification, to reduce overall energy bills, the interaction of the two will make energy bills higher for residents. This will, therefore, lead to the first change in building regulations in history that does not reduce bills. This directly contradicts the policy objective of reducing the rate of energy poverty in Scotland.

This is because electricity is more expensive per unit than gas, meaning electric heating is much more expensive to run than gas heating. Indeed, the Scottish government's own analysis in Figure 6 of the ClimateXChange report “Cost of Zero Emissions Heating in New Build Homes” suggested that installing an Air Source Heat Pump (the lowest running cost option of ZDEHs) would add 45% the energy bills of the homeowner when installed without solar PV. In financial terms, this is £130,000 increase in running costs per year (£433 per property). However, as energy prices have effectively doubled since the publication of this report, this cost could double. This is not theoretical: 43% of households who use electricity as their main heating type were in fuel poverty in 2019 (compared to 22% of households who use gas and 28% of households who use oil) before the energy price cap rose and the average fuel bill increased by 50%.

A fundamental way that the new Standard can prevent the transition to electric heating from driving an increase in energy bills is by ensuring the provision of onsite energy generation, such as through solar energy systems, on all new buildings. Solar Energy UK recently published a comprehensive report on the running cost savings of combining solar with a low carbon heating technology. This is based on extensive, industry-validated modelling, and shows that retrofitting a solar energy system on a home could offer an effective annual saving over the lifespan of the system of up to £3,164, depending in the heating system used. Crucially, what is clear is that under every scenario tested, the best financial performance is delivered by installing solar with a modern form of heating – such as a heat pump or infrared heating. Furthermore, the cheapest point at which to install any technology on a home is when it is built. This is because, for example, electrical and other contractors are already on site, and the scaffolding which would otherwise need to be erected solely to install the solar is already in place, because of the need to install the roof.

As such, there is no credible case for implementing any Standard that it can reasonably be foreseen will lead to the installation of a low-carbon heating system without onsite energy generation, such as solar. The investment case for transitioning away from gas to low-carbon heat with onsite generation is in the national and consumer economic and environmental interest.

This is true in Scotland as it is in the UK. The Scotland-specific modelling carried out as part of the new Solar Energy UK research shows that a homeowner in Northeast Scotland who has retrofitted their home to a high standard of energy efficiency (EE5 - approaching that of a new house) and has a green mortgage could see a 21% reduction in annual energy costs when solar is installed with electric heating, and a 37% reduction in annual energy costs when solar is installed with a heat pump (based on analysis presented in the Solar Energy UK report “The Role of Solar Heat Technologies in meeting Scottish

net zero targets.” Furthermore, a pilot project run by Stirling Council found that installing storage batteries to complement existing solar panels on tenant homes resulted in tenant homes being over 90% self-sufficient in the summer months, and provided tenants the ability to buy cheaper, off peak electricity in winter. Solar PV as part of energy efficiency or low carbon heating installations will allow homes to be made fit for the future whilst lowering fuel bills now – a truly no regrets option.

In light of the robust modelling carried out as part of Solar Energy UK’s research – which was overseen by a steering group with a wide range of relevant external expertise – we do not believe that it is appropriate to base the new Standard on the assumptions made in the ClimateXChange report “Costs of zero emissions heating in new build (climutexchange.org.uk),” cited by the Scottish Government in these proposals. These do not reflect the true value of solar energy systems in home heating.

First, as the report does not make clear the size of PV systems which were assessed, or the electricity cost used, it makes analysis difficult. We believe the cost reductions as estimated in Figure 6 of the report greatly underestimates the benefits of solar energy. Indeed, our analysis suggests that adding solar to a typical new build property would, rather than reduce the running cost of 300 homes by £30,000/year (£100/per house value), reduce running costs by closer to £135,000/year (£450/per house value)(Based on the analysis found in the Solar Energy UK report “The Role of Solar Heat Technologies in Meeting Scottish Net Zero Targets).

However, based on the timing of the report and a basic back-calculation using running costs provided, it is likely that the impacts of increased running costs due to heat pumps or cost savings due to adding solar have at least doubled. In effect, the expected benefit of adding solar would be close to £900/property.

It also appears that the capex cost of adding solar is based on pricing from 2013. This is an incredible and completely inappropriate date to use for cost assumptions, given the huge decline in solar installation costs since then, of approximately 60% as of 2021. Allowing for the fact that costs may have increased since 2021, Solar Energy Scotland have approached the authors of this publication to further understand their analysis. As yet, we have been unable to do so. We would be appreciative of the opportunity to consult on this figure and provide our own analysis.

Furthermore, The New Build Heat Standard, despite being SAP based, does not recognise the value of onsite/exported generation. The regulations remove any benefit in the energy performance calculations for new homes from exported solar energy produced by rooftop solar panels. This is out of line with not just the rest of the UK, but many other national building regulations across the EU, which recognise the value of onsite solar power as part of the net energy position of the building. The effect is unfairly prejudicial to the uptake of solar and associated smart energy technologies and could make homes with electric heat and vehicles unduly expensive for consumers.

Solar Energy Scotland acknowledges that the aim of discounting any exported energy from on-site generation is intended to encourage the design of a building which reduces the overall energy delivered requirement, and benefits those using the building. However, this is a missed opportunity to attribute value to renewable energy generation which is exported back the grid. While the Scottish Government has made strong and welcome progress towards a low carbon electricity network, electricity currently makes up a fraction of Scotland’s energy use, with the majority being non-electrified heat and transport. The role of Scotland’s solar homes in exporting zero-carbon electricity must be recognised in Scotland’s grid-level energy calculations. Indeed, doing so could in theory incentivise developers to install more solar – and hence deliver a greater financial benefit as well as a greater carbon benefit – because it would enable them legitimately to claim improve carbon performance of their property developments.

There are further issues which are likely to arise as a result of the intersection of the New Build Heat Standard, the most recent building regulations, and the upcoming intention to regulate for the provision of electric vehicle charging on new buildings. These include the fact that the huge potential of new housing developments to supply electricity to meet this demand will not be realised. This is further important precisely because these developments will result in the need for significant investment in distribution network reinforcements, because of the increased demand associated with heat pumps and electric vehicles.

Solar Energy Scotland is in conversation with both major Distribution Network Operators (DNOs) in Scotland relating to these issues. The role of onsite generation and energy storage in helping to balance electricity supply and demand is crucial, especially given the known constraints caused by the significant offshore wind generation at the extremity of the Scottish network.

Designing the Standard to maximise the benefit of onsite generation and storage is vital and can help deliver this. Solar Energy UK in coordination with the Centre for Renewable Energy Systems Technology at Loughborough University modelled these benefits in its Smart Solar Homes project. This research showed that delivering 4.4 million homes with solar and energy storage could help eliminate the evening peak electricity demand on a typical winter’s day. It is vital that new home regulations design in the maximum contribution that Scotland’s homes can make to achieving this outcome.

Consultation questions: technologies

3 Are there any limited, specific situations where the use of bioenergy systems would be required in new buildings?

Not Answered

4 If ‘Yes’, what do you believe the criteria should be for introducing such an exemption?

Please provide evidence to support your answer:

Consultation question: conversions

5 Do you agree with the approach to conversions as set out in section 2.3?

Not Answered

6 Do you envisage any unintended consequences as a result of this?

Not Answered

Please provide reasons for your answer:

7 What criteria would you use to define the replacement of a direct emissions heating (DEH) system as being 'reasonably practicable'?

Please provide reasons for your answer:

8 What criteria would you use to define it as being 'not reasonably practicable'?

Please provide reasons for your answer:

Consultation questions: equality

9 How might these proposals impact upon people with one or more of the protected characteristics listed in the Equality Act 2010 (for example: a positive, negative or neutral impact)?

Please provide reasons for your answer:

10 How might these proposals help the Scottish Government ensure due regard of the three needs of the Public Sector Equality Duty (PSED)?

Please provide reasons for your answer:

Consultation questions: non-domestic

11 Do you anticipate any form of heating within a non-domestic building which will require direct emissions heating (DEH) after 2024?

Not Answered

Please provide details of the factors – whether technical, economic or social – which would require DEH after 2024:

On non-domestic buildings, whilst we agree with the application of the New Build Heat Standard's requirement for ZDEH is positive in principle, and was consulted on in part 1, there now exists the same concerns of unintended consequences and missed opportunities as do for dwellings. This is due to the intersection of the requirement for ZDEH alongside the uplift for building standards in the new non-domestic technical handbook.

Non-domestic new builds will now be required to meet an energy delivered target, which is welcome, but the lack of requirement for any solar contribution to areas of the buildings where heating is met by heat pumps and the lack of any value attributed to exported solar generation is a significant missed opportunity. We believe this issue could be further complicated for non-domestic buildings where the intended purpose of a non-domestic building, their energy delivered, and future energy demand could vary significantly between the point of design and the point of construction.

Non-domestic buildings including warehouses, retail sites, ports, airport, storage facilities, logistics and distribution centres, factories, other manufacturing plants and a huge range of other buildings all have the potential to include solar generation and realise the same benefits outlined in this document. For example, a 2022 report by highly respected energy consultancy Delta EE for the UK Warehousing Association showed that the roof space of the UK Warehouse sector alone could deliver 15GW of solar capacity. The Scottish Government must recognise this and ensure that it considers the potential of solar in all its work on new build heat, including for commercial and industrial property.

About you

12 What is your name?

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13 What is your email address?

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14 Are you responding as an individual or an organisation?

Organisation

15 What is your organisation?

Organisation:

Solar Energy Scotland

16 The Scottish Government would like your permission to publish your consultation response. Please indicate your publishing preference:

Publish response with name

17 We will share your response internally with other Scottish Government policy teams who may be addressing the issues you discuss. They may wish to contact you again in the future, but we require your permission to do so. Are you content for Scottish Government to contact you again in relation to this consultation exercise?

Yes

18 I confirm that I have read the privacy policy and consent to the data I provide being used as set out in the policy.

I consent

Evaluation

19 Please help us improve our consultations by answering the questions below. (Responses to the evaluation will not be published.)

Matrix 1 - How satisfied were you with this consultation?:

Please enter comments here.:

Every question should have the opportunity to provide reasoning and elaboration.

Matrix 1 - How would you rate your satisfaction with using this platform (Citizen Space) to respond to this consultation?:

Please enter comments here.: