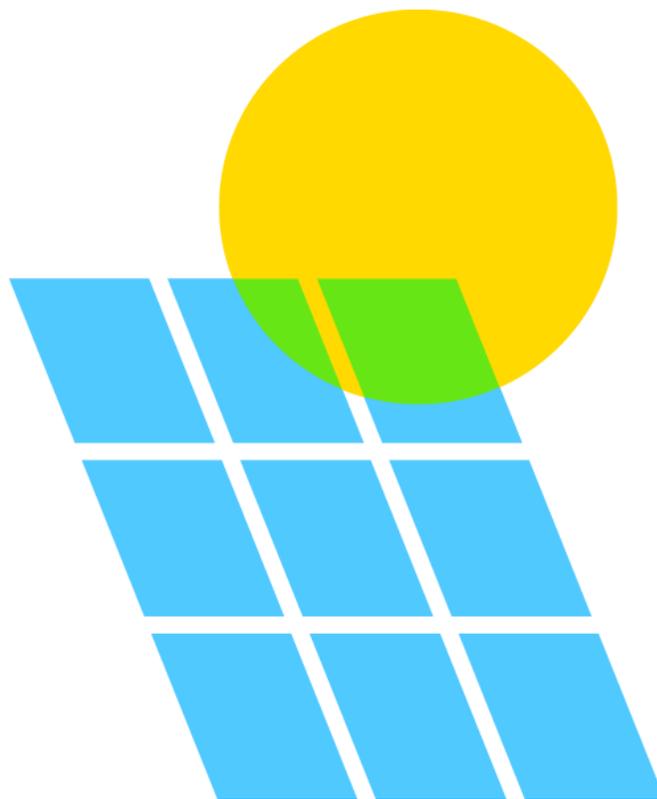




Scottish Building Regulations



About us

Since 1978, Solar Energy UK has worked to promote the benefits of solar energy and to make its adoption easy and profitable for domestic and commercial users. A not-for-profit association, we are funded entirely by our membership, which includes installers, manufacturers, distributors, large scale developers, investors, and law firms.

Our mission is to empower the UK solar transformation. We are catalysing our members to pave the way for 40GW of solar energy capacity by 2030. We represent solar heat, solar power and energy storage, with a proven track record of securing breakthroughs for all three.

Respondent details (for consultations)

Respondent Name: Rachel Hayes, Policy Analyst; Kevin McCann, Policy Manger

Email Address: rhayes@solarenergyuk.org

Contact Address: Chapter House, 22 Chapter Street, London, SW1P 4NP

Contact Telephone: 0203 637 2945

Organisation Name: Solar Energy UK

Would you like this response to remain confidential? No

Introduction

We welcome the opportunity to comment on the consultation on *Scottish Building Regulations – proposed changes to Energy Standards and associated topics*, which looks to improve the next set of standards for domestic and non-domestic properties across Scotland. These standards will make an important contribution to Scotland's economic and decarbonisation targets, and we strongly support work to improve the energy performance of new and existing building stock.

Over the last several years, the rate of deployment of solar photovoltaic (PV) installations on Scottish new build properties has grown substantially. Major housebuilders and developers now recognise solar PV as one of the most effective and affordable methods to meet building regulation demands, as well as the multitude of benefits it brings to homeowners. New smart technologies and appliances that adjust energy use to make best advantage of solar generation, energy storage and the Time of Use tariffs offered by energy suppliers will only add to the benefits solar brings to residents

Based on EPC data, it is estimated that more than 60% of all homes built in Scotland in 2020 have rooftop solar, however the experience of rooftop PV installers in our membership suggests that this figure could now be as great as 80%.

However, this progress could be undone without careful consideration of the interaction between the proposed energy standards as outlined within this consultation and the proposed 2024 new building heat standard. The consultation sets out a gas boiler specification, which includes PV, and an air source heat pump specification, which does not. Our primary concern is that once zero emission heating (at point of use) becomes mandatory in 2024, housebuilders will effectively have no option but to transition to air source heat pumps and solar will be lost from new homes. To address this, we ask that Scottish Government reviews the regulation again prior to the introduction of the 2024 new build heat standard to increase energy uplift requirements by adding solar PV to the heat pump notional specification.

Otherwise, the interaction of the two regulations risks losing the benefits that solar on new builds has provided in Scotland, such as providing affordable energy bills and reducing emissions.

To deliver net zero by 2045, rapid decarbonisation of all energy demand alongside quick deployment of clean renewable technologies will be needed. As a result, the demand for electricity will skyrocket as heat and transport are electrified and electric vehicles (EVs) grow in popularity. Onsite electricity generation, such as solar, should be promoted wherever possible to alleviate any unnecessary expense to homeowners, reduce the need for expensive and complex grid reinforcement works, and enable climate targets to be met as quickly as possible.

Decarbonising the grid is a necessary step to achieving net zero, but the additional load implied by electrification could result in system-level strain on the network, absent major investment, and engineering works. This will also take years to deliver. Distributed, local, onsite power generation such as solar energy supports new and existing buildings to meet their own demand wherever possible, reducing strain on an already outdated grid.

We develop these points in our responses below. Thank you for taking our points into consideration.

Questions

- 1. Do you support the extension of standard 6.1 to introduce an energy target in addition to the current emissions target? If yes, do you have a view on the metric applied – primary or delivered energy?**

The consultation proposes the introduction of an energy target which Solar Energy Scotland strongly supports. This adoption of an additional energy target, alongside the current emissions target would bring Scotland in line with the other nations of the UK and EU.

We support that primary energy should be the principal metric, with CO₂ as a secondary performance metric for compliance. To these we suggest that a metric for household affordability should be added to ensure domestic new build properties meet the intended standards whilst preventing high running costs or energy bills and ensuring a Just Transition, Solar Energy Scotland believes that the energy target should be Net Primary Energy, calculated net of the export of site generated energy in line with other jurisdictions in Europe and the UK.

Delivered energy if chosen should also be net of exports, but has the disadvantage compared to Primary Energy that it doesn't consider the fossil inputs and relative inefficiencies in extraction, transportation, and conversion.

2. What level of uplift to the 2015 standard for new dwellings do you consider should be introduced as an outcome of this review?

The 2015 building regulations in Scotland have been a huge boon for the deployment of solar on new build properties. Solar Energy Scotland estimates more than 80% of pitched roofs on new homes in Scotland now come with solar, and numerous Scottish PV installation companies have scaled up to serve this demand. Scotland has an established solar supply chain, with a wide range of companies involved in the manufacture, distribution, installation, operation, and maintenance of solar PV and solar thermal systems. The technology is mature and solar companies are used to integrating their work with that of the construction, roofing, and electrical and mechanical installation industries. Indeed, the current Scottish building regulations have provided strong support for and delivered a successful PV installation industry in Scotland.

To continue to support this growth, as a minimum, Government should apply the notional building 2 option under the improved standard, with the view to being more ambitious and setting the 57% uplift, as in the advanced standard, as the recommended option. In the notional building 2 specifications outlined under the improved and advanced standards of this consultation, the gas boiler specification includes the use of PV, but the air source heat pump version of the specification does not.

In isolation, we are supportive of the options for uplift for new buildings as set out within this consultation proposal. However, when in combination with the policies outlined in the 2024 new build heat standard the focus moves from technology agnostic towards a narrower scope centred around air source heat pumps. Once zero emissions heating (at point of use) becomes mandatory, housebuilders will then switch over to that specification, with the unintended consequence that solar may disappear from new homes as the transition to heat pumps is made.

Without careful consideration, the progress of Scottish solar on new builds could be underdone and benefits in bill savings, emission reductions, fuel poverty, energy efficiency and more that solar has brought about through the current building regulations will be lost. To address this, we ask that Scottish Government implement a higher specification for the air source heat pump (to include PV) published alongside the new regulations, flagging an uplift that will come into force when the New Build Heat Standard become mandatory. This will allow for the construction industry to plan ahead, ensuring the materials, workforce and logistics are in place, and signal that solar is a part of future scenarios.

Additionally, to ensure a just transition for all, the impact of new building regulations on energy bills must be considered. Solar is a proven technology, which can be deployed quickly, delivering rapid economic benefits on a local and national level. Over the last 10 years, the costs of solar have declined dramatically, by more than 80%. This trend is continuing, and solar PV is now the most affordable form of electricity according to the Government's own figures.¹ The transition to low carbon heating can be made more affordable for residents by adding solar PV to the heat pump specification in the new building regulations.

¹ [BEIS electricity generation cost report \(2020\)](#)

Scottish Government's own impact assessment makes it clear that the ASHP specifications result in homes with higher running costs than the 2015 regulations with gas heating (see Annex). This need not be the case with the simple expedient of adding solar PV to the ASHP specification. The solar generation does not need to coincide with heating demand to reduce the running costs of a property because there is significant electricity use (unregulated) from plug in appliances which can be offset. Further, exported electricity can also reduce overall running costs or even generate revenue under the Smart Export Guarantee (SEG).

3. What level of uplift to the 2015 standard for new non-domestic buildings do you consider should be introduced as an outcome of this review?

We encourage Scottish Government to be as ambitious as possible. We recommend a minimum uplift of 25%.

4. Do you have any comments or concerns on the values identified for the elements which make up the domestic notional building specification for either option, e.g. in terms of their viability/level of challenge?

We believe that the amount of solar in the notional house is an achievable amount that will fit on roofs, especially as more efficient solar panels have become available. The inclusion of solar directly provides a reduction in energy costs for households, making energy bills more affordable and contributing to the reduction of energy poverty.

6. Do you have any comments on the simplified two-specification approach to defining the domestic notional building from 2022?

We strongly encourage the inclusion of solar PV with air source heat pumps under the air source heat pump specification. Solar is an impartial enabling technology which when combined with heating technologies such as heat pumps to make low carbon heating more affordable for the consumers, whilst also making the energy system more efficient and easing pressure on the grid supply.

10. Do you agree with the principle set out, that the benefit from on-site generation within the compliance calculation should be limited by a practical assessment of the extent that generated energy can be used onsite?

We applaud Scottish Government's ambition to decarbonise the economy with 100% renewable technologies, with significant progress made in 2020 when renewable generation in Scotland was equivalent to 97.4% of electricity demand. We note that this figure includes exported renewable electricity and that, when measured on the same basis that this consultation proposes to measure homes, (excluding renewable energy exports to the rest of

the UK) the figure is far lower. In fact, in 2019 Scotland exported almost one third (32%) of its electricity to England and Northern Ireland.²

If measured in the same way as the proposal to homes, a much lower figure of 65% of Scotland's electricity consumption was provided by renewables. When considering Scotland's actual renewable energy proportion of total domestic energy use there is more to do – and a diversified mix of renewables, including solar, will allow Scotland to cover a higher percentage of its energy use with renewables, better covering periods of low wind.

We strongly disagree with the principle to exclude the benefits from exported onsite generation; giving no benefit to exported power from PV installations. Solar Energy Scotland encourage Government to include energy for export within the calculation as the generated energy is used in the local network, offsetting fossil fuel generation and relieving grid pressure.

We are concerned that the net energy consumption of the property will not be included within the calculation and that government is only focusing on what is being imported into the property. This is a particularly unusual proposal given the majority of countries (both within the UK and worldwide) consider net energy use over import only. See BENG requirements in Netherlands for example.³

Government must also recognise the role of onsite storage in building the energy system of the future. Onsite PV generation and storage will need to play a central role in reducing strain on the grid and absorbing the increased demand from the electrification of heating and transport. As demonstrated in our report on Smart Solar Homes⁴, energy generated and stored at a local level not only has direct benefits for consumers but can provide system level benefits, reducing peak demand and delaying the need for costly infrastructure upgrades.

Encouraging widespread flexibility can defer costly grid reinforcements, in turn benefiting energy bills as grid upgrade costs are passed through to consumers. Increased flexibility will also enable new renewables to connect to the grid and even prevent renewable generators from being turned off or turned down when there is too much generation at times of low demand. Flexibility can further decrease carbon emissions by reducing the need to use high-carbon fossil-fuel generators at peak times and is critical in helping to prevent unintentional outages, disconnections, or unnecessary investment in expensive infrastructure.

Smart homes with larger storage systems, help reduce the load on the grid, because electricity supply and demand are in the same place, and hence there is no need to transmit power. This

² <https://www.yes.scot/renewables-powerhouse>

³ <https://www.rvo.nl/onderwerpen/duurzaam-ondernemen/gebouwen/wetten-en-regels/nieuwbouw/energieprestatie-beng/beng-gebouwtype/beng-criteria/beng-2-primair-fossiel>

⁴ <https://solarenergyuk.org/resource/smart-solar-homes/>

can provide additional flexibility services to the grid without affecting their self-consumption and peak shaving ability. Looking to 2030 and beyond, this could lead to further carbon reductions as surplus periods of renewable generation become more frequent.

Moreover, the current SAP calculation does not properly account for combinations of smart technologies to limit exported electricity. For example, it allows either a battery storage or a PV hot water diverter, but not both technologies to be used together. We are extremely concerned that the proposal unfairly disadvantages solar and doubly so when the technologies to limit export cannot be modelled in SAP.

12. Do you support the need for new buildings to be designed to enable simple future adaptation to use of a net zero direct emissions heat source where one is not initially installed on construction? And for information setting out the work necessary for such change to be provided by the building owner?

We strongly support that new buildings should be designed to enable ease of retrofit to zero carbon heating in future. The decarbonisation of the built environment cannot be delivered solely on the backs of homeowners. In supporting a just and expedient transition, the regulations should be designed to accelerate the transition to low carbon heating across new and existing buildings.

Ideally, the revised standards should be designed in such a way as to minimise the need for further retrofit in the near future by setting the highest possible standards in the short term. It is much more cost-effective and affordable for residents and homeowners to minimise the need for future retrofits, particularly over the short-term, wherever it is possible to avoid the need for such works. Wherever this is not the case, new builds should be designed to minimise the cost to owners/occupants to undertake future retrofits.

28. Do you agree with the proposal to limit distribution temperatures in wet central heating systems to support effective implementation of low and zero carbon heat solutions and optimise the efficiency of heat generation and use?

We agree. Introducing a limit for distribution temperatures in wet central heating systems will be considerably more cost effective and future proof the property removing the need to retrofit at a later date and avoids the inevitable disruption of that comes with installations undertaken when a building is already in use.

51. What are your views on our policy goal to enable the installation of Electric Vehicle (EV) charge points and ducting infrastructure (to facilitate the future installation of EV charge points) for parking spaces in new residential and non-residential buildings parking?

We support the policy goal to enable to installation of EV charge points and infrastructure for parking spaces in new residential and non-residential buildings. The electrification of transport is a key method to decarbonise the economy, and ensuring that all new buildings are EV-ready is a sensible measure to accelerate uptake. Installing the charge points and infrastructure at point of construction is also far more cost effective than retrofitting later, and avoids the potential for any disruption with installations undertaken when a building is already in use.

56.Do you have any other views that you wish to provide on the EV section of the consultation (e.g. the minimum standard of EV charge point or safety within the built environment)?

As a general point, we would note that EV technology is advancing rapidly, and there are multiple types of charge points available. We recommend that the building regulations have regard to the need for building occupier convenience and consider how best to ensure interoperability for the range of EVs on the market. There must be no risk of new regulations inadvertently meaning only particular types of EVs be charged.

Annex 1 – Running Costs

“Improvements to Energy Standards for New Buildings within Scottish Building Regulations 2021: Modelling Report”⁵

ASHP spec results in an increase in running costs for householders against a gas heated home built to 2015 regulations in all cases.

⁵ <https://www.gov.scot/binaries/content/documents/govscot/publications/research-and-analysis/2021/07/research-report-modelling-proposed-energy-improvements-new-domestic-buildings/documents/improvements-energy-standards-new-buildings-within-scottish-building-regulations-2021-modelling-report-domestic-buildings/improvements-energy-standards-new-buildings-within-scottish-building-regulations-2021-modelling-report-domestic-buildings/govscot%3Adocument/improvements-energy-standards-new-buildings-within-scottish-building-regulations-2021-modelling-report-domestic-buildings.pdf>

Table 1.14g: Lifetime costs by home, case and heating type (£ present value per home)

Lifetime cost category	Detached 1. Improved with Gas	Detached 2. Advanced with Gas	Detached 3. Improved with ASHP	Detached 4. Advanced with ASHP	Semi 1. Improved with Gas	Semi 2. Advanced with Gas
Reference heating system	Gas	Gas	Gas	Gas	Gas	Gas
Change in capital cost	£7,057	£11,097	£4,505	£8,545	£4,272	£7,148
Change in 60 year energy cost	-£5,185	-£5,667	£5,544	£3,710	-£3,401	-£3,874
Change in renewals cost	£1,467	£1,455	£3,268	£3,256	£873	£898
Change in maintenance cost	£0	£826	-£2,002	-£1,177	£0	£826
Change in lifetime cost	£3,339	£7,710	£11,316	£14,334	£1,744	£4,998

Lifetime cost category	Semi 3. Improved with ASHP	Semi 4. Advanced with ASHP	Mid-terrace 1. Improved with Gas	Mid-terrace 2. Advanced with Gas	Mid-terrace 3. Improved with ASHP	Mid-terrace 4. Advanced with ASHP
Reference heating system	Gas	Gas	Gas	Gas	Gas	Gas
Change in capital cost	£3,154	£6,030	£3,996	£6,581	£2,878	£5,463
Change in energy cost	£3,412	£2,236	-£3,352	-£3,755	£3,463	£2,089
Change in renewals cost	£3,203	£3,228	£860	£850	£3,190	£3,180
Change in maintenance cost	-£2,002	-£1,177	£0	£826	-£2,002	-£1,177
Change in lifetime cost	£7,767	£10,318	£1,504	£4,501	£7,529	£9,555