

**Draft Heat in Buildings Strategy**: *Achieving* *Net Zero Emissions in Scotland’s Buildings*

# **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.

Solar Energy Scotland, part of Solar Energy UK, works to shape policy that will enable Scotland to fully realise its potential for solar and energy storage application within the power, heat and transport sectors, in contribution to the nation’s aim of reaching net zero by 2045.

# **Respondent details**

Respondent Name: Rachel Hayes (Policy Analyst)

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 respond to the Scottish Government’s *Heat in Buildings Strategy: achieving net zero emissions in Scotland’s buildings* consultation. We appreciate the Scottish Government’s focus on this issue, as the decarbonisation of heat is a critical component of achieving net zero by 2045, five years ahead of the rest of the UK.

In the decarbonisation challenge, there is no one size fits all solution for low or zero carbon heating. However, in every case, solar photovoltaic (PV), solar thermal, and energy storage should be part of the solution. Decentralised renewable energy generation alongside smart, flexible systems are rapidly replacing centralised fossil fuel plants, and solar and storage will be key drivers in accelerating the energy transition and the decarbonisation of heating.

Our primary recommendation, given the expected substantial increase in demand for electricity as a result of the electrification of heating, is to ensure solar technologies are included as primary or secondary technologies in low and zero emission heating systems. The addition of solar would help make certain that electrified heat is not produced at unnecessary expense to consumers, reduce the need for expensive and complex grid reinforcement works, and enable renewable heat objectives to be met as quickly as possible.

We develop these points in our responses to the questions below.

Thank you for taking our points into consideration.

**Questions:**

1. **To what extent do you support the pathway set out for achieving the 2045 net zero target and the interim 2030 target?**

Overall, we are supportive of the pathway set out for achieving the 2045 target. We agree that if the Scottish Government is to achieve its net zero ambitions by 2045, rapid deployment of low and zero emission heating systems is essential.

To ensure the electrification of heating is truly decarbonised, the resultant increase in electricity demand must be met by zero carbon electricity generation. On site solar generation, particularly when combined with other enabling technologies like solar thermal and battery storage, will be essential to delivering low carbon heating while minimising impacts on consumer heating costs.

Solar is a shovel ready 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 photovoltaic (PV) is now the most affordable form of electricity to produce according to the Government’s own figures.[[1]](#footnote-2)

We are supportive of requiring new buildings to use zero direct emissions heating by 2024. However, we recommend an interim step be implemented to increase onsite power generation and storage with the addition of improving fabric measures in the hypothetical building. This would encourage the construction and renewable energy industries to scale their supply chains in advance of the transition which will need to take place from 2024, and ensure that the materials, workforce, and logistical structures are in place to deploy the future capacity required.

1. **What are your views on any risks of unintended consequences from this pathway?**

Whilst we are supportive of the transition to net zero technologies, government must be careful to avoid saddling homeowners with large energy bills because of the electrification of heat. Solar directly contributes to reducing energy costs for households, making energy bills more affordable and contributing to the reduction of energy poverty.

As discussed in our response to the new build heating standard: scoping consultation, our recommendation would be for Government to include an affordability target, similar to the target proposed (although subsequently dropped) in the update of English building regulations. By doing so, the Scottish Government can demonstrate leadership on this issue, and ensure that the twin objectives of delivering carbon-neutral homes at reasonable cost to the consumer are achieved.

One way to alleviate higher energy bills from new heating systems is to ensure a continuing core role for onsite generation. Onsite generation, such as solar, combined with home energy storage, such as batteries, is cost effective because:

* Consumers with a solar system on their home or building produce part of the power needed to meet their own demand.
* Solar is a form of distributed generation, and hence helps avoid the need for investment into grid and other infrastructure, the costs of which would otherwise be borne by consumers as part of their energy bills.
* The capital costs of delivering domestic scale solar are relatively small compared with some fabric measures, such as significant increases in insulation. This is because they have an impact in turn upon structural considerations such as the thickness of walls, and hence foundation sizes. The costs of these are ultimately passed on to house buyers in the sale price of new homes.

Furthermore, we would recommend Government initiates a research programme to confirm the installed performance of heat pumps, as opposed to the laboratory or theoretical performance. This would build on research from the Energy Saving Trust, which indicates that the real-world system performance of heat pumps may not be as high as modelled, and so the cost of heating may be higher than anticipated.[[2]](#footnote-3)There is a major risk to consumer willingness to adopt low-carbon technologies if stories emerge about buyers of new homes receiving high energy bills due to regulations imposing a particular type of heating system, and so it is important that this be investigated in detail.

1. **What are your views on our assessment of strategic technologies in low and no regrets areas to 2030?**

Whilst we are supportive of improving energy efficiency and in no way discourage it, we do not agree that it should take priority over installation of onsite generation technologies. Technologies such as solar (classed as secondary technologies within this strategy) enable the deployment of electrified heating and other smart technologies to be cost effective, because consumers produce at least some of the power needed to meet their electricity demand, and hence reduce their energy bills.

Onsite generation, when combined with storage, helps 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. To further support such technologies, we call for stable long term regulatory support and innovation funding to demonstrate the potential of a similar scheme in Scotland.

REflex Orkney, a multi renewable technology project has future plans to roll out solar and storage as part of a heating installation service to significantly reduce energy bills for consumers and reduce carbon emissions.[[3]](#footnote-4) As mentioned above, including battery storage will support the already heavily constraint grid and store excess generation on the local network to supply during times of high demand. The development of REflex Orkney and similar future models will be vital in meeting decarbonisation targets. We strongly encourage Government to support and accelerate the development of innovative business models by unlocking innovation funding.

Solar is an impartial technology which can be combined with other heating technologies such as heat pumps, combi-boilers, hydrogen to make low carbon heating affordable for the consumer. Whilst we are understanding of Governments concerns on the deployment of hybrid systems, there is a vital role in which they must place to ensure the transition to low carbon technologies is financially viable for Scottish homeowners. Hybrid systems, for example solar and heat pumps allow homeowners to have a cost effective, affordable, and more efficient energy system.

Government must be cautious not to place too much dependency on hydrogen gas in the short term. Whilst we are supportive of hydrogen deployment, as stated in the consultation hydrogen is constrained in its near-term availability. Therefore, we would suggest government look at alternative technologies such as Solar PV and thermal technologies which are shovel ready, tried and tested technologies.

We recognise the importance of heritage sites within Scotland. The versatile design of PV panels makes it a good option for heritage sites far less intrusive option in comparison to other forms of renewable energy such as wind turbines. We would refer the Government to a report by the Campaign to Protect Rural England (CPRE) on good practice for solar PV designers, manufacturers and installers has highlighted the importance of place-responsive design.[[4]](#footnote-5) This report sets out recommendations for ensuring installations are in keeping with the properties’ characteristics and are respectful of the surrounding area.

The same principle can be applied to the influence of solar PV on landscapes. PV panels have a much lower level of reflective capacity than objects such as windows which are frequently found on prominent buildings. Additionally, solar panels need not affect a building’s aesthetic. As mentioned earlier in the consultation, a report conducted by theCPRE Report concluded that responsive design and placement of solar PV encourages “an approach that is sympathetic to the building and the local area from which it can be seen.” We suggest the Government review this document with particular attention to the case studies provided.

5. **How do you think a new heat target should account for the need to deliver against our statutory fuel poverty targets?**

Given the expected increase in demand for power as a result of the electrification of heat in Scottish homes and buildings, measures to improve energy performance should support the inclusion of onsite generation wherever possible. This would help make certain that electrified heat is not produced at unnecessary expense to consumers, reduce the need for expensive and complex grid reinforcement works, and enable renewable heat objectives to be met as quickly as possible.

As discussed in question 2, one of the most effective ways to alleviate higher energy bills for new heating systems is onsite generation. The combination of solar and storage is an effective and affordable way to reduce consumer energy bills as they generate the power to meet their own demand. In addition, we would welcome a clear pathway for addressing the upfront costs of installing these technologies for low-income households.

In our response to question 2, we recommended government include an affordability target, like the target proposed (although subsequently dropped) in the update of English building regulations. Whilst it is important that all new build properties should be constructed according to ambitious building regulations, with meaningful targets for onsite generation technologies such as solar, government must consider increasing funding for retrofitting properties for private homeowners, social landlords, and through community investments. Enhancing energy efficiency measures of the UK’s existing house stock through a range of retrofit and policy measures is vital to not only achieve net zero on time but to optimise network infrastructure investment.[[5]](#footnote-6)

We also encourage government to recognise the importance of incentivising as well as regulating. Cash back grants or similar fiscal incentives for onsite generation assets as well as heat technologies would significantly increase deployment.

We expand on our position further in question 28.

6. **Do you agree that a new heat target should apply to heat in buildings, distinct from industrial heat?**

We agree that a new heat target for heat in buildings should be separate from industrial heat. However, considerations must be made to except incentives for the commercial and industrial sector to contribute to local heat networks.

**10. What are the most significant actions we can take to ensure that Scotland’s people and organisations are meaningfully engaged in the net zero heat transition?**

We would encourage Scottish Government to recognise the importance of participation in policy design to promote well shaped policies that fulfil the needs of people. To facilitate this, government must provide ample opportunities for engagement through maximising accessibility of consultations and providing workshops that cater to all. This can help reduce perceived complexities around renewable heat technologies and provide opportunities to educate consumers to avoid high unexpected cost. This approach is key for shaping the progression and efficacy of policy in support of the Just Transition.

Whilst we acknowledge that Scottish Government continues to lead the way in delivering funding mechanisms such as grants and loans (e.g. Home Energy Scotland) we strongly encourage further dissemination of the information available to the public, particularly around financial support. We are aware of a number of social landlords who are familiar with the Energy Efficiency Standard for Social Housing (EESSH) but were not aware of the previous rounds of funding that were available to them. Similarly, millions of households across Scotland are aware of rising energy bills but have limited knowledge of the financial support available.

We are concerned that installer members of Solar Energy Scotland, who are fully aware of the HES and similar funding opportunities, continue to be stifled from propagating information due to strict guidelines. This must be addressed immediately. To achieve the focus points outlined in the draft public engagement strategy for heat in buildings, we call for Scottish Government to expand the availability of advice, support, and dissemination of information to support all in the just transition.

Solar Energy Scotland represents a diverse range of industry experts from across the solar and storage sectors. We encourage government to capitalise on our wealth of experience to support the development of solar, storage, and thermal technologies to address the current lack of understanding expressed within the consultation. Our members have expressed frustration at the lack of direct engagement from Scottish Government in recent years. We encourage government to be more proactive in engaging with experts across a wide range of technologies to capture the expertise of the entire renewable industry in the decarbonisation process. Engagement across a mix of renewable technologies is required to rapidly and cost effectively decarbonise the electricity sector.

Solar Energy Scotland has identified areas where this lack of consideration across technologies has impacted policy development. Most recently in the National Planning Framework 4, where the omission of any mention of solar within the statement was alarming. The policy design process must be accessible and inclusive if the Government wishes to uphold its commitments to an open policymaking process. In addition, we suggest that government should not only be receptive to expanding the design process but also the policy options considered.

**10. What in your view are the opportunities, if any, available to key organisations, such as local government, businesses and trade associations and community or other non-government organisations, in supporting this public engagement activity?**

In the recent NPF4 consultation, government highlighted that to achieve an inclusive and strong net zero strategy no single development or planning policy alone would be suitable. Considerations must be made to ensure all communications from government are understandable and well disseminated at all levels of the policy making landscape (from Local Authorities to businesses and community organisations). Government must work with Local Authorities to increase understanding of available options for promoting renewable energy and support them in perusing appropriate options for local deployment to support the delivery of strong climate change policies at a local and national level.

Solar Energy Scotland can support the dissemination of and engagement with government climate policy, as we represent a diverse range of members within the immediate solar industry and beyond. Government must continue to make sure information and messaging materials regarding climate change policy are easily accessible for all.

**14. What is your view on the current level of support and advice provided through existing services such as Home Energy Scotland and the Energy Efficient Business' Support service?**

The Scottish Government’s Community and Renewable Energy Scheme (CARES) is an exemplary model for encouraging and engaging with a diverse range of voices from the public. The success of CARES can be measured both empirically, through its addition of over 500MW of renewable energy to the Scottish grid in less than half the projected time, and conceptually through the empowerment of communities and democratisation of energy that has resulted from the funding of its projects. We commend government for the success of the scheme and would welcome continued investment to expand the scheme further.

Many mechanisms that encourage uptake of solar technologies are, by nature, inclusive of diverse consumer groups. For example, through the Home Energy Scotland Loan, homeowners and eligible registered private sector landlords in Scotland can now more affordably make a wider range of home improvements. We support the idea that these loans ensure a fair, inclusive, and smooth transition to more sustainable future. However, we are conscious that more could be done to promote the loan and provide further support to homeowners. Over the last financial year, we are aware that the full amount of loan support on offer was not exhausted. If managed correctly, the extension of the scheme will provide better accessibility and support for households and SME business as outlined in the paper.

**15. Are there any further suggestions that you could provide on how the customer journey through these delivery services could be improved, in light of the ambitions set out in this strategy?**

Solar Energy Scotland have felt underwhelmed and frustrated by the delivery of schemes in recent years. The outgoing Renewable Heat incentive has been disappointing perhaps due to lack of awareness and the low attraction of drip-fed money over the following years. In England, the Green Homes Grant, which covered approximately 66% of system costs (100% in some cases) was promising and could have been expanded into a longer term, stable grant scheme. However, the delivery of the scheme was executed poorly though frustrating administration and badly calibrated policy.

We encourage government to learn from and act on these failures to give the renewable mechanism a fair chance to prove itself. The current administrative burdens must be rectified to install confidence back into customers and across the renewables industry. Similar incentives can and do work, for example Home Energy Scotland scheme, which we are hugely supportive of as referred to throughout the consultation.

**19. What are your views on our approach to phasing out funding for fossil fuel heating systems by 2024 where it is not detrimental to our fuel poverty objectives? Do you think that this could be achieved any sooner than 2024, and if so how?**

We agree with the introduction of the complete Standard in 2024. However, we recommend an interim step be implemented in advance its introduction, to include improved fabric measures and increased onsite power generation in the notional building. This would encourage the construction and renewable energy industries to scale their supply chains in advance of the transition at scale which will need to take place from 2024, and ensure that the materials, workforce and logistical structures are in place to deploy the capacity required.

Scotland has an established solar supply chain, with a wide range of companies involved in the manufacture, distribution, installation, operation, maintenance and decommissioning of PV and 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. This industry, and the associated supply chain, are significantly larger than in the rest of the UK, on a per-capita basis. For example, approximately 80% of new Scottish homes are built with a solar system installed.

**20. What changes can be made to the Strategy to help maximise positive impacts and minimise negative ones on people experiencing fuel poverty and other vulnerable groups?**

We are concerned that solar and solar thermal deployment could be held up due to the lack specialist knowledge surrounding the technologies. Whilst we are understanding of the Government’s call for further research, we urge government to lean on and utilise industry expertise to fill the knowledge gap “enabling measures such as solar PV and thermal storage to help reduce running costs in order to further support the deployment of low and zero heating emissions” as stated in the consultation. Solar Energy Scotland represents a diverse array of expertise from across the sector with specialist knowledge of solar PV, thermal and storage across differing scales. We would welcome the opportunity to provide good quality evidence to support solar, thermal and storage as we have done with case studies throughout our response.

Additionally, government could support our efforts in providing a solid evidence based for solar technologies through targeted innovation support. Accelerating the deployment of solar, thermal, and storage can help those in fuel poverty by providing low carbon heating systems which are affordable and cost effective with minimal/no risk of worsening the depth of fuel poverty. To support deployment at both the scale and pace needed, present policy barriers must be removed. Our recommendations are as below:

* Except solar and storage from business rates, as combined heat and power is, would stimulate SME investment in renewables. Since 2017, businesses installing on-site solar assets have faced a disproportionate 600-800% rise in business rates. The increase has prevented many installations in the commercial and industrial sector from going ahead due to the high rates significantly reducing the savings solar affords and increasing payback periods.
* Extend the non-domestic Permitted Development Rights threshold for solar from 50kW to 1MW to align with UK policy, or take further leadership and fully remove the threshold aligning with Wales. This will deliver increased opportunities for the deployment of solar at all scales.
* Increase funding and support for private homeowners, landlords, community investment, social landlords to retrofit homes.
* As highlighted previously in our response, we ask that Government includes an affordability target for new builds, like the target proposed (although subsequently dropped) in the update of English building regulations.

**21. What are your views on how we can support place-based deployment of zero emissions heat within our delivery programmes?**

We are encouraged by the Scottish Governments high placement on importance for local communities to be involved in decision making within local areas. This approach is key for shaping the delivery of net zero programmes and supporting a just transition.

Embracing solar in all its forms, will deliver a host of benefits across society. Decarbonisation requires the active engagement of all members of society, and no other energy generation technology empowers engagement in the clean energy transition to the same extent as solar. Consumers can engage directly with decarbonisation at the individual and societal level through solar and storage technology, through direct visible impacts on reducing their energy bills, by providing revenue streams to consumers for exported energy, and by enabling direct access to ownership of renewable energy generation assets.

We mentioned in previous questions we are very supportive of the government’s ambitions to extend the successful CARES programme.

**25. What is your view on the timescales proposed for LHEES?**

Local Authorities participation is essential for a just and fair transition. We agree that Scottish Government should encourage Local Authorities to adopt local area LHEES strategies. Indeed, the key powers of Local Authorities, such as planning, can maximise the number of households which are able to reduce carbon emissions. All new homes should be constructed according to ambitious building regulations, with meaningful targets for onsite generation. Meanwhile, inhabitants of existing homes should be supported through inclusive retrofit schemes such as Energiesprong – a pioneering approach which incorporates innovative procurement and business models to stimulate the retrofit market at a very low cost to the tenant/homeowner.[[6]](#footnote-7)

Whilst we are supportive of setting long term sustainability targets, we also encourage government to focus on what is deliverable in the short term. The timescales proposed in the draft strategy could be more ambitious, rolling out the LHEES and delivery plans at the earliest date upon completion of the pilot scheme.

**26. Do you agree with the approach to LHEES set out above? If not, please give reasons to support this.**

We agree.

**27. What are your views on what Permitted Development Rights might help enable in the heat transition, in addition to those we have already included in the Permit ted Development Rights review programme?**

Solar Energy Scotland is concerned that the current, outdated 50kW Permitted Development threshold is considerably reducing opportunities to deploy solar in Scotland. Government should review their position on this. Solar Energy Scotland recommends at a minimum moving the threshold from 50kW to 1MW to align with UK policy, or further moving to fully remove the threshold has Wales has done. By extending permitted development rights to all solar installations - as well as relaxing unnecessarily strict planning laws - Scottish Government can enable stakeholders to use solar as a vital tool in the decarbonisation of heat.

The strategy emphasises the need for local energy solutions which can be tailored to the diverse requirements of communities across the whole of Scotland. A versatile technology by nature, Solar is ideal in this circumstance. Both photovoltaics and thermal collectors can be installed at mass and micro scales to ensure that households, businesses, farmers, manufacturers, and public bodies - all of whom are explicitly mentioned in the statement - are able to participate in a just and clean energy transition. However, deployment has historically been challenging for both domestic and utility-scale sites and there remain clear barriers to uptake. Outdated planning policy and reduced permitted development rights have long-prevented homeowners, businesses, and landowners from generating their own clean energy at a localised scale.

Solar Energy Scotland is concerned that despite several consultations over the last 6 years considering the removal of the 50kW threshold, government is still yet to act. The Government should increase the threshold or remove it all together to stimulate investment in solar right across the industry.

**28. In your view, is there further action that can be taken to ensure that our electricity systems are ready for heat decarbonisation? If yes, please provide further information.**

The transition to electrification will undeniably place a substantial increase on the demand of our electricity system. This is true for both national transmission and distribution networks, and local networks: our understanding is some developers are already concerned about how to meet site-wide electrical demand for developments that do not include upcoming technologies such as electric vehicle charging. These can reasonably be forecast to generate significant *additional* demand in future, and the impact will be more pronounced unless smart technologies and on-site generation are developed and deployed as a fundamental principle of modern heating.

When it comes to the decarbonisation of heat and transportation, solar PV, especially when coupled with on-site energy storage assets, is a critically important enabling technology. On-site 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 Homes[[7]](#footnote-8), energy generated and stored at a local level, can provide system level benefits, reducing peak demand and delaying the need for costly infrastructure upgrades.

While we welcome the progress Scotland has made on decarbonising its grid-connected electricity, there are also concerns relating to fugitive emissions including refrigerant gases from heating systems. These gases can escape as part of the installation, scheduled and unscheduled maintenance, service and repair, and decommissioning of heating systems, and can have Global Warming Potential thousands of times higher than carbon dioxide. We therefore recommend that the full consultation seek views on whether fugitive emissions should be incorporated into assessments of point-of-use emissions, potentially with a requirement for the performance benefits of other measures to be increased to compensate for the carbon impact of these emissions.

29. **What are your views on the changes set out above for the electricity networks and are there further actions that could be taken by government, the regulator or industry that would make these more cost effective? Please provide evidence to support any suggestions.**

There is a major infrastructure challenge inherent to delivering the loads necessary to support electrified heating. This in turn implies major investment and engineering work to ensure the networks are ready, over a significant timeframe. However, the use of onsite generation such as solar PV provides a way to mitigate this. Co-locating electricity supply and demand would mean that zero-carbon heating in new Scottish buildings will be able to draw on electricity produced at the point of use. This would help alleviate pressure on high-voltage networks, reducing the need for heavy engineering, and ensure that existing capacity is used to support the Scottish Government’s broader decarbonisation goals as effectively as possible.

Solar and wind technologies are complimentary, preforming best at different times of the day and different times of the year to one another. Solar Energy Scotland members Absolute successfully won a tender in 2014/2015 to install a solar farm with Mackies Scotland.[[8]](#footnote-9) This was one of the first installations in Scotland to share a grid connection with a wind turbine. “With a total installed capacity of 1.8MW, the ten-acre site complements the four wind turbines (total 3MW), providing peak power in summer when wind levels drop.”[[9]](#footnote-10) (Figure 1)

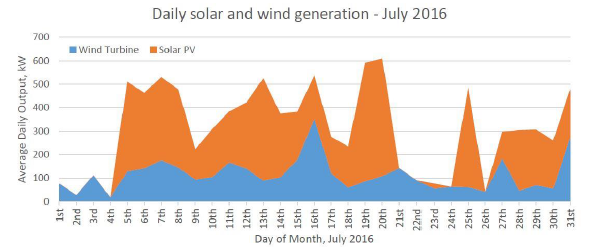


Figure 1: Mackie’s Solar farm, daily solar and wind generation in the month of July, 2016 (500kW Wind, 1.8MW Solar)

There is more beyond the planning and co-location opportunities identified by government in recent consultations thus far that the Government can do to support the deployment of renewable technologies, as such reducing strain on electricity networks. We agree that it is important to strengthen the support for re-powering and expanding existing wind farms as suggested in the recent NPF4 Consultation, however an identical level of support should be provided by Scottish Government for the expansion of solar projects.

Solar Energy Scotland continues to regularly engage with DNO’s. At present there is enormous untapped grid potential for the deployment of solar in Scotland. Scottish Government could further accelerate clean energy deployment by encouraging DNOs to adopt calculation and queue management methodologies appropriate for variable output. Solar, for instance, exports only during daylight hours, and yet network operators continue to err on the side of caution, in accordance with outdated calculation methodologies. We strongly encourage government to amend this immediately to avoid limiting deployment of solar as grid constraints are being identified which do not exist.

**30. In your view, what changes are needed to ensure that those least able to pay, including those in fuel poverty, are not unfairly impacted by the transit ion in our electricity and gas networks?**

Government must recognise the importance of including solar technologies within renewable energy heating systems as a way to prevent those in fuel poverty being mandated to implement measures they can’t afford. Research has demonstrated that PV can make a valuable contribution to reducing social housing tenants fuel bills and alleviating fuel poverty. Analysis of electricity bills pre and post PV installation in 42 households found an average reduction of £90 per year after the PV was installed.[[10]](#footnote-11)

To continue to support those in fuel poverty, Solar Energy Scotland supports the use of grants and zero interest loans to support, increase and update domestic solar and storage technologies. These measures have been very effective in the past, enjoying substantial uptake and should continue to be employed to stimulate markets in the post-covid economic recovery. At present, the relative low carbon intensity of electricity in Scotland has resulted in money being directed toward heat and transport. Whilst Solar Energy Scotland is encouraged by this, government must provide confirmation of assured continuation of interest free loans that support PV and battery storage as well. We would also welcome action to support the finance industry to develop relevant consumer finance products, such as green mortgages, that would enable consumer to access capital to finance green home improvements.

Alongside contributing to fuel poverty alleviation, the adoption of solar deployment also leads to the creation of new jobs. Solar, alongside other renewable energy development has considerable potential to drive local economic growth and provide substantial sustainable job opportunities. Solar PV requires one of the highest percentages of labour compared to other renewable technologies. Recent studies have observed that employment in the solar industry can provide approximately 20 FTEs/MW for rooftop projects and 7 FTEs/MW for large scale ground mount projects.[[11]](#footnote-12)

**33. What evidence can you provide on the potential for heat networks in Scotland that can help inform a new ambition for deployment within the final Heat in Buildings Strategy?**

Heat networks are widely agreed to be of significance on the path to decarbonisation. However, certain renewable technologies are excluded from contributing to certain classic heat network designs. Solar Thermal, for example, which operates at a lower temperature than most existing networks require for initial feed-in sources.

Heat networks present a proven option to provide low carbon heat to a large number of buildings without putting the burden of upfront cost and decision making on the individual. The economics and technical feasibility have been proven for decades in other countries such as Denmark, Austria and Germany.[[12]](#footnote-13)

Solar Heat networks, powered by PV/solar thermal deliver a cost-effective way of reducing carbon emissions from heating at scale. Silberberg, Denmark hosts a 156,700m² (110MW) plant where solar- thermal delivers 20% of the annual district heating demand.[[13]](#footnote-14) “Solar collectors have been the most cost-effective technology to supply 22,000 households with renewable heating, and help the area reach the goal of 100% carbon neutral heat by 2030.”[[14]](#footnote-15) Solar thermal now plays an important role in Denmark’s extensive district heating systems, as such Scottish Government should capitalise on the opportunity to deploy solar heat networks to drive down consumer energy bills in the transition to net zero.

When looking at longer term decarbonisation solutions, government must consider the synergistic relationship between solar and hydrogen. In an effort to reduce the reliance on methane gas, hydrogen presents itself as a viable option. Solar PV could generate a significant share of the electricity required to produce hydrogen.

**38. Do you agree with the strategic funding priorities set out above?**

Overall, we agree. Whilst we are supportive of the funding priorities set out within the consultation, Government must ensure that solar, thermal and storage continue to be eligible under the second strategic priorities under the successors to LCITP, DNLF and CARES.

**41. What are your views on the role of government funding over the next five years? For example, should it be focused towards significant increases in the volume of renewable heat and energy efficiency measures installed or more targeted at specific priority groups or technologies?**

Government must focus on technologies which are deliverable en masse today, such as solar PV, solar thermal, and battery storage. A rapid delivery of said technologies will by association drive down energy costs for consumers, making the Just Transition affordable for all and support priority groups most in need.

Solar can be coupled with other low carbon heating technologies such as heat pumps, combi-boilers and hydrogen to make heating systems affordable for the consumer. Hybrid systems, for example solar and heat pumps allow homeowners to have a cost effective, affordable, and more efficient energy system. We call for Government to include solar PV or storage with any heat pump system.

We would encourage government to further support private homeowners by expanding interest free loans and cash back incentives for onsite renewable heat technologies to at least 2025.

A similar ask for the expansion of current grant and loan opportunities would also be important for helping SME Businesses. To further support businesses, government must address the disproportionate business rates and except solar and storage, as combined heat and power is, to stimulate SME investment in renewables or risk not achieving the proposed deployment targets over the next 5 years.

We are supportive of the proposed pilot projects listed throughout the strategy. Government could take advantage of this opportunity further by scheduling maintenance with energy retrofit, for example if government were considering rooftop maintenance on building stock, this would provide an ideal opportunity to consider the deployment of solar PV. This would provide additional occasions to increase renewable heat installations.

**45. What are your views on the approach out lined above to take action towards a long-term market framework for net zero emissions in buildings?**

The Government’s long term market framework has the potential to act as a catalyst to build the momentum needed to reduce emissions and support the just transition. We agree that both private and public investment will place an important role to converting build stock to zero emissions by 2045. Government must ensure the heat in buildings strategy provides a detailed strategy to ensure its high-level commitments are accompanied by a clear plan for how they will be met. Onus must also be placed on the public sector as well as private.

Further, although we are supportive of setting long term sustainability targets, we also encourage Scottish Government to focus on what is deliverable over the next decade**.** Solar and storage are proven, rapidly deliverable technologies. At present, the level of deployment in Scotland is considerably lower than that of the other countries within the UK. However, in recent years, planning permission has been secured for solar projects with a combined output of over 100MW of consented projects. Given the potential that already exists, Scotland could be hugely disadvantaged if a favourable planning environment is not created for solar and auxiliary technologies by virtue of NPF4 failing to recognise these more explicitly.

**47. What financing mechanisms are needed to encourage investment from householders, businesses and the private sectors?**

Solar Energy Scotland supports the use of grants and zero interest loans to increase the uptake of domestic solar and storage technology. These measures have been very effective in the past, enjoying substantial uptake and should continue to be employed to stimulate markets in the post-covid economic recovery. At present, the relative low carbon intensity of electricity in Scotland has resulted in money being directed toward heat and transport. Whilst Solar Energy Scotland is supportive of this, government must provide confirmation of assured continuation of interest free loans that support PV and battery storage as well. We welcome action to drive the finance industry to develop appropriate customer finance options, such as green mortgages which would enable consumers to access capital to investment in green home improvements.

More can also be done to unlock the potential of the solar industry and reduce emissions in buildings. The current business rates regime, for example, is a significant barrier not only to the deployment of on-site solar and storage assets, but to SMEs looking to reduce their carbon footprint and respond to the increasing interest of stakeholders in business sustainability as highlighted in the draft strategy. Since 2017, across the UK businesses installing onsite solar have faced a 600-800% rise in business rates. The increase has prevented many installations in the commercial and industrial (C&I) sector from going ahead due to the rates significantly reducing the proportion of energy savings businesses can realise from self-generation and consumption and increasing payback periods. Excepting solar and storage from business rates, as is already the case for carbon intensive technologies like gas combined heat and power, would stimulate SME investment in renewables once again.

Battery storage assets will also pay business rates from the next revaluation, meaning businesses seeking to cut emissions through investing in smart technologies will be similarly penalised. High business rates will further deter the nascent onsite storage market, already facing tight economics and regulatory uncertainty, to the detriment of the UK’s leadership in smart technology.

Solar Energy UK agrees that in certain situations zero emission heating systems can be more expensive to run then traditional fossil fuel systems. As mentioned previously in the consultation, the addition of solar PV to heating systems can drive down heating costs considerably for homeowners.

**48. What are your views on the timescales set out for the application of the regulation set out above?**

The draft strategy makes no distinction between non-domestic rental properties and owner-occupied properties. We ask that government provides further clarification around EPC standards. Furthermore, the strategy only states that Scottish Government will consult until 2024 on EPC standards, with all buildings then having to comply by 2045. Whilst we welcome the Government’s considerations to provide sufficient time for the transition, we are concerned that the table on regulatory proposal and standards on page 117 of the consultation sets out a extremely large amount of time for consulting and legislation. When looking comparatively to the UK Energy Whitepaper, there is a requirement for all non-domestic buildings to be EPC B by 2030. We strongly encourage Scottish Government to do the same, or risk falling behind the rest of the UK.[[15]](#footnote-16)

An EPC target as suggested above would strongly support the commercial sector. Solar would likely be one of the easiest solutions for commercial premises with large roofs to hit the EPC targets.

**55. What more can be done to support the development of sustainable,**

**high quality and local jobs in the heat and energy efficiency supply**

**chain across the breadth of Scotland?**

Solar, alongside other renewable energy development has considerable potential for driving local economic growth and creating employment opportunities. We urge the Scottish Government to capitalise on this by promoting the substantial sustainable job opportunities provided by solar in comparison to other technologies. There are various studies on the job intensity and employment opportunities provided by solar as documented in UK Energy Research Council Literature Review 2014. It should be noted that solar PV requires the highest labour percentage compared to most other renewable technologies. Furthermore, the ‘Renewable Energy and jobs: Annual Review 2019’ states that the solar industry represent one third of the total renewable workforce worldwide.[[16]](#footnote-17)

**57. In recognition of the proposals in the forthcoming skills consultation, what further action can be taken to support skills development in Scotland over the lifetime of this strategy?**

The Scottish Skills consultation provides a comprehensive development plan that encompasses the skills required to meet the demand for skilled workers within the heat industry.

Training and upskilling individuals will be a vital component in delivering Scotland’s Net Zero ambitions. Providing a strong, supportive, and coordinated training matrix will be essential element to achieve this. We would encourage Scottish Government to use MCS as basis of competency and benefit from their well-established training schemes.

We are encouraged by Scottish Government’s ambitious pathway to deliver the skills requirements needed to address the current skills gap. We strongly support the Government proposal to provide expansive industry training through accredited training courses within colleges and universities. In addition, Solar Energy UK is aware of an MCS apprenticeship training scheme in the pipeline that covers low carbon heating. We would encourage government to work with MCS on this training scheme to deliver it at pace and at sale.

Additionally, thought should be given to rural and island communities where delivering training may be less accessible. Provisions must be made to ensure these communities are not left disadvantaged.

**60. To what extent do you agree that the issues identified must be**

**addressed jointly by the UK and Scottish governments to unlock**

**delivery in Scotland?**

We encourage Scotland to continue to show leadership in the decarbonisation of heat as they have done with electricity. As the UK is likely to be slower, Scottish Government must be nimble and use the powers under its remit to continue to be ambitious in delivering the just transition.

However, Scottish Government must continue to foster cooperation with UK Government to tackle issues alike the outdated grid which hinders deployment of renewable energy on a national scale. Jointly supporting solutions such as on-site generation and storage will undoubtedly have a central role to play in reducing strain on the grid and absorbing the increased demand from the electrification of heating and transport.

**70. Is there anything else you would like to highlight about the role, opportunities for, and constraints of, specific types of organisation (such as local Government, other public sector, trade associations, individual business organisations, charities, environmental organisations, community groups) in contributing to the transition to zero emission buildings, in particular over the next five to ten years?**

Solar Energy UK members are on the frontline of energy system change, with many able to deliver smart functionality to homes and offices with no delay.

Finally, we would like to encourage Scottish Government to recognise the unique perspective that trade bodies can contribute the transition to net zero buildings. Trade Associations, like Solar Energy UK, have diverse memberships with expertise spanning across the industry. We strongly encourage government to utilise this knowledge base to encourage growth of the solar, thermal, and energy storage sectors.

Solar Energy UK is a trading name of Solar Trade Association Limited, registered in England and Wales,  
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