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Business, Energy  
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The Rt Hon Philip Dunne MP, Chair  
Environmental Audit Committee  
House of Commons  
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Dear Philip,

Thank you for your letter of 21 December 2020, regarding the Committee's inquiry into technological innovation and climate change.

We are strongly committed to decarbonising heat in homes and businesses across the UK and welcome the Committee's inquiry. As you rightly point out, our aim of 600,000 heat pump installations a year by 2028 is ambitious and will require concerted effort from both industry and Government, but we believe it is critical to achieving our Net Zero ambitions and will be a key component in our green recovery from the current pandemic.

My department is focussed on creating the right policy framework to allow industry to scale up the supply chain and meet demand for heat pumps. We do not underestimate the urgency or size of the challenge in decarbonising heating in homes and businesses across the UK. That is why we will be laying out a clear long-term approach in our forthcoming Heat and Buildings Strategy, and to support our Strategy we will also be consulting on the policies needed to enable the market to grow.

I have provided more detailed responses to your specific questions in the annex to this letter.

*Kind regards*

**Lord Callanan**  
Parliamentary Under-Secretary of State  
Department of Business, Energy and Industrial Strategy

## Annex – Response to Environmental Audit Committee Questions

### Green Homes Grant

*“The Green Homes Grant is a commendable initiative and its extension by one year is welcome. However, if we are to succeed in increasing the number of heat pump installations from under 30,000 per year to 600,000 per year by 2028, the Green Homes Grant must be extended further to become a multi-year scheme. This will give installers and consumers the confidence needed to invest in the initiative and help open the heat pump market. **Will you, in 2021, review and consult on reforms to the scheme to better target potential installers? Will you commit to extending the Green Homes Grant to become a multi-year scheme beyond 2022?”***

We are listening to feedback on the Green Homes Grant scheme and it is under continuous review. We have numerous channels open for dialogue with the supply chain and consumer groups, including regular roundtables with certification bodies, trade bodies and other representatives from the industry. In December, the Department held its first webinar on the Green Homes Grant, taking questions directly from 150 installers, in response to feedback that direct engagement would support installer engagement with the scheme.

The Green Homes Grant Scheme is just one element within the Government’s strategy to support hundreds of thousands of green jobs and help decarbonise millions of British homes and public buildings over the next decade, including the Home Upgrades Grant and the Public Sector Decarbonisation Scheme. We are also seeking to introduce the Clean Heat Grant, as a successor to the Renewable Heat Incentive, which will support heat pumps, and in certain circumstances biomass, through an upfront capital grant to help address the barrier of upfront cost.

### Future Homes Standard

*“We welcome the introduction of the Future Homes Standard to ‘future proof’ new build homes with low-carbon heating and high levels of energy efficiency. We are concerned, however, that the implementation of this was first by 2025, then by 2023 and is now in the “shortest possible timeline”. This does not accurately reflect the UK’s commitment to accelerating our path to net zero. We were told that a definite date is needed to set a trajectory for industry to mobilise behind and drive necessary demand to meet the scale of deployment set out in the Ten Point Plan. The Energy White Paper’s commitment to a consultation on whether it’s appropriate to end gas grid connections to new homes being built from 2025 is a welcome step. **Will you commit to bringing forward the Future Homes Standard ahead of 2024, in line with the Climate Change Committee’s recommendations?”***

The Ministry for Homes, Communities and Local Government (MHCLG) has recently published [the Government response to the Future Homes Standard consultation](#). This sets out a roadmap to the Future Homes Standard to be implemented in 2025.

The 2025 timeline delivers on the Government net zero commitments, while ensuring that new homes are delivered in sufficient numbers in the places that we need them; providing

the good quality, warm homes that consumers expect; and continuing to keep energy bills low.

The Government has listened to calls for a swifter and more certain pathway and the work on a full technical specification for the Future Homes Standard has been accelerated. The Government intends to consult on this in 2023 and introduce the necessary legislation in 2024, ahead of full implementation of the Future Homes Standard in 2025.

However, we are not waiting until 2025 to take action. It has been 8 years since the energy efficiency standards for new homes were last reviewed and, in that time, the Government has made a commitment to net zero greenhouse gas emissions by 2050. In the short term, the Government's priority will be to implement an interim 2021 Part L uplift for new homes as swiftly as possible. This is a key stepping stone that will enable successful implementation of the Future Homes Standard in due course.

In parallel to this, we will continue to progress our plans to consult on the feasibility of ending gas grid connections to new homes in favour of clean energy alternatives.

### **Non-Domestic RHI**

*“While heat pumps are known in residential applications, they are much less recognised for their contribution potential in commercial and industrial applications. Ground source, water source and air source heat pumps installed in non-domestic settings are currently eligible for non-domestic RHI support. However, the non-domestic RHI will close to new applications on 31 March 2021 despite having supported the installation of only 2,396 heat pumps to date. The Clean Heat Grant, which is set to replace the domestic RHI, will not contain support for non-domestic heat pumps above 45kW. **Will the Government consider extending the non-domestic RHI? If not, will it consider providing incentives, such as grants, for large (above 45kW) heat pumps in non-domestic settings?”***

The Government response to the consultation 'Non-Domestic Renewable Heat Incentive: ensuring a sustainable scheme' was published on 14th January this year. This has confirmed the department's intent to close the Non-Domestic RHI (NDRHI) scheme to new applications on 31 March 2021, as scheduled.

However, we have introduced two measures within the current NDRHI to further support non-domestic heat pumps above 45kW. For heat pumps above 100kW, on 20<sup>th</sup> July 2020 the department confirmed a new flexible allocation of tariff guarantees and extended commissioning deadlines for existing tariff guarantee projects to 31st March 2022. This action has provided support to projects facing delays due to the impact of COVID 19 and represents value for money to more cost-effective projects.

For heat pumps below 100kW, the department announced that projects can also apply for an extension if they are able to evidence that resource was invested in project development before 17<sup>th</sup> August 2020. Extension applications can be submitted in the final month of the scheme (March 2021) and if granted, will have 12 months after scheme closure to submit a properly made, full application.

The Government recognises the need to take a fair and proportionate approach to supporting businesses on their path to net zero, and we continue to consider our longer-term approach in supporting the growth of large heat pump installations.

### **Training Installers of Heat Pumps**

*“The increase in the deployment of heat pumps relies on the development of a secure supply chain that can ensure sufficient production and high-quality installation. Evidence suggests that, whilst the initial growth in installers will come from reskilling existing gas and electrical engineers, there needs to be a concerted attempt to bring new entrants into the market. Whilst we welcome the launch of the Green Jobs Taskforce and the Green Homes Grant Skills Training Competition, we were told that the Government must create a visible, long-term market that makes heat pump installation a stable and desirable profession. **Will you commit to funding a dedicated training programme, working with the Department of Education, to support a long-term strategy for education and training in green jobs?**”*

We are committed to establishing a visible, long-term market that creates the right environment to attract professionals to train to become heat pump installers. Aside from establishing the Green Jobs Taskforce and awarding funding through the Green Homes Grant Skills Training Competition, the Department of Education has also made available up to £18 million to support technical bootcamps for training professionals in clean growth, electrotechnical, welding or engineering; an Invitation to Tender was published in January 2021.

Furthermore, we are working with the Department of Education and Institute for Apprenticeships and Technical Education to review the existing higher and further education framework to support low-carbon heating professionals entering the market, this includes reviewing the existing apprenticeship framework and exploring the possibility of establishing a new Low-carbon Heating Technician Professional Standard.

We will monitor the effectiveness of existing support in increasing installer numbers and will intervene as necessary to ensure the supply chain continues to grow to meet demand and to ensure that the workforce has the appropriate skills.

*“We heard that going forward, it is vital that installation quality and standards are maintained. The Microgeneration Certification Scheme (MCS), a quality assurance scheme supported by BEIS, is a requirement for heat pump installations made under the Domestic RHI, the Green Homes Grant and the Clean Heat Grant. However, between 2014-2017 there has been a 65% reduction in MCS accredited installers. We were told there are currently only 850 MCS accredited heat pump installation companies in the UK, equating to roughly 2,000 individual installers (in comparison to the 100,000 plus Gas Safe engineers). **Please tell us how your Heat and Building Strategy will address the much-needed increase in certified installers to meet expected demand? Will you consider introducing similar installation standards to new build properties?**”*

The number of registered businesses with the Microgeneration Certification Scheme (MCS) has grown with the introduction of the Green Homes Grant, and there are currently over 930 air-source heat pump installation companies accredited by the MCS, and of

these around 600 also install ground-source heat pumps. We expect this number to continue to grow with the introduction of other policies to support the increased rollout of heat pumps. However, we are closely monitoring the situation to ensure the growth in the installer numbers matches demand and drives effective competition.

Furthermore, we want to ensure that installation standards are applied consistently to all installations of heat pumps and the Government is considering the suitability of referencing technical standards on heat pump installations in the Approved Documents, which provide practical guidance on how the Building Regulations can be satisfied in some common situations. Any changes would apply to both existing and new build homes.

### **Heat Pump and Energy Efficiency Retrofit Costs**

*“Ensuring that heat pumps are affordable will be key for a successful mass roll-out scheme. We heard that heat pumps are typically three to four times more expensive to purchase and install than conventional gas boiler alternatives. Buildings with poor thermal insulation will also have to undergo significant remedial work (such as new radiators, insulation, underfloor heating) to allow for heat pump efficiency. The Northern Housing Consortium told us it will cost an average privately owned household £19,300 for retrofit and £5,000 for a heat pump. However, we heard from you that the average cost of retrofit for a privately rented property (without a heat pump) is expected to cost just £4,700. **Could you please clarify what efficiency measures are installed under your estimated retrofit cost of £4,700? Do these measures allow for the household to support a heat pump efficiently? If they do not, will you publish an updated cost estimate of the level of retrofit required to support a heat pump?”***

This figure relates to our consultation on increasing the minimum energy efficiency standards in the Private Rental Sector (PRS), which closed on the 8th January. This consultation proposes a minimum Energy Performance Certificate (EPC) band of C across PRS properties, with landlords required to make as much progress as they can towards this minimum standard under a £10,000 cost cap (under the preferred scenario).

Our modelling suggests that on average landlords will spend £4,700 per property making progress towards the EPC Band C, if a maximum cap of £10,000 on the total investment is set. This estimate is based on the general principle of improving the fabric efficiency of a building before heat and electricity generation – known loosely as the ‘fabric first’ approach. Combined with a cost-effectiveness principle, the current fabric first approach presents recommendations on EPCs in the following order: (1) insulation, (2) heating and hot water, (3) windows and doors upgrades, and (4) electricity generation measures.

However, reaching EPC Band C can be achieved in a number of ways and it is for landlords to install measures recommended on an EPC in any order of preference they want as long as they comply with the Private Rental Sector Regulations. The EPC recommendations are derived from the Standard Assessment Procedure (SAP) which, for existing buildings, includes a list of permissible measures (RdSAP Appendix T).

Our analysis suggests that reaching EPC Band C is not a pre-requisite for making a household suitable for a heat pump. Some homes will inevitably require upgrades to the heat distribution system for a heat pump to operate effectively, which could cost between £500-£1,500, but most homes in the UK are technically suitable for a heat pump with no

improvements to the fabric efficiency of the building. That being said, lowering heat losses by investing in energy efficiency will improve the performance of a heat pump and reduce the overall cost of heating. The complex trade-off between capital and operating costs continues to be an important consideration in designing policy to support the deployment of heat pumps.

## Heat Pump Suitability

*“A central challenge to the increased uptake of heat pumps is to ensure they are being installed in the most appropriate and suitable properties first. The technical suitability of heat pumps depends on a range of building characteristics (e.g. its fabric efficiency) in addition to the physical characteristics of the building (e.g. location, space constraints, planning constraints). We heard that the Climate Change Committee has identified 10 million homes which are heat pump ready and a further 10 million that can be upgraded to be reasonably efficient to host a heat pump. **Have you identified these 20 million homes in order to target them? If not, how do you plan to do so? Does your estimated retrofit cost of £4,700 per household apply to the 10 million homes that can be upgraded?**”*

The department has modelled the housing stock to determine suitability for a heat pump. Current estimates suggest around 90 per cent of homes in England and Wales are considered to have sufficient energy efficiency and internal electrical capacity for a low temperature heat pump, and even more would be considered suitable for a high temperature heat pump. This provides a good understanding of which homes to target for the installation of heat pumps and is being factored into policy design.

We acknowledge that some housing archetypes may pose specific challenges to the deployment of heat pumps. For example, some terraced houses and flats may have limited space for an air-source heat pump outdoor unit, and some homes with high heat demand and poor insulation may require significant investment in energy efficiency measures to make them suitable. We are exploring where innovation can overcome some of the challenges to the deployment of heat pumps through the government’s £14.6 million Electrification of Heat Demonstration Project. The project is currently underway and aims to demonstrate the feasibility of a large-scale roll-out of heat pumps in Great Britain, by installing the technology in a representative range of 750 homes, alongside new products and services that have been designed to address some of the key practical and consumer barriers to the uptake of heat pumps.

## Hydrogen-Ready Hybrids

*“The Climate Change Committee has stated that hydrogen could play a valuable role in combination with heat pumps as part of a hybrid system. Within this system, heat pumps powered by low-carbon electricity, provide heat efficiently for most of the time, with hydrogen boilers contributing mainly as back-up to meet peak demands. This can avoid the need for disruptive measures such as large radiators and solid wall or floor insulation, manage grid congestion, and will allow consumers to shift between electricity and hydrogen to take advantage of lower prices. **How does the Government intend to support hydrogen-ready hybrid heat pumps? Will hybrid heat pumps be included in the upcoming Hydrogen Strategy?**”*

My Department has been considering the potential role of hybrid heating systems to decarbonise heat. Hybrids may be suitable for retrofitting homes, and they are currently supported through our Green Homes Grant and Renewable Heat Incentive schemes. However, a long-term role for hybrids in a 2050 net zero future is dependent on the fossil fuel part of the system being converted to a clean fuel supply, such as 'green' hydrogen. Therefore, depending on strategic decisions taken about hydrogen and hydrogen-ready appliances, hybrids that combine a hydrogen-ready gas boiler and a heat pump may have a role as we seek to decarbonise heat.

BEIS is currently exploring the role of hybrid heat pump systems as part of the Electrification of Heat Demonstration Project. The project aims to gather further evidence on how these systems operate in practice, which will provide more in-depth understanding of hybrids' role in decarbonising heating going forwards.

The Government is also supporting a range of research, development and testing projects designed to help determine the feasibility of using low-carbon hydrogen as an alternative to the use of natural gas for heating, including a hydrogen village trial which should begin in 2025. To support this work, prototype 'hydrogen-ready boilers' are being developed under the £25 million BEIS Hy4Heat programme. We plan to consult on the role of hydrogen-ready appliances later in 2021. The evidence gathered through the consultation will help us to assess the case for if, when and how government should encourage or require newly installed gas boilers to be hydrogen-ready in the 2020s.

We will further outline the Government's position on hybrids, and the possibilities of hydrogen hybrid heat pumps in more detail in the upcoming Heat and Buildings Strategy.

### **Relative Costs of Electricity and Gas**

*"The Government has placed low-carbon policy costs on the electricity side of consumer bills. As a result, the cost of electricity is roughly four times more expensive than gas. This drives out operational cost savings for customers relative to gas boiler use and, in some instances, increases heat pump bills. This acts as a significant barrier to heat pump adoption. Demonstrating the operational cost savings that could accrue from heat pump use (relative to gas boiler use) is a key selling point for customers. **We were told that reviewing the policy costs across gas and electricity could significantly improve the customer case for heat pumps, making them cheaper to run than gas boilers in many more domestic settings. Will you consider reviewing where policy costs fall on energy bills?**"*

As we continue to progress towards a clean energy system, fairness sits at the heart of our approach. We want households and businesses to be confident that all energy users are fairly sharing in the costs and benefits of the transition. We recognise that there are price considerations between electricity and gas, alongside efficiency and demand level issues, that make switching from gas boilers to heat pumps a challenge.

In our Energy White Paper, we announced that we will publish a Call for Evidence by April 2021 to begin a strategic dialogue between government, consumers and industry on affordability and fairness. This Call for Evidence will help us better understand the different types of price considerations and trade-offs within the energy system and inform government decision making on how energy costs (to meet our Net Zero goals) can be allocated fairly and in a way that incentivises cost-effective decarbonisation.

## Public Awareness

*“Finally, one of the biggest barriers to the mass deployment of heat pumps is public awareness and acceptance. Heat pumps are not a technology with which most people are familiar, and the potentially disruptive installation and high capital cost can deter many. A key challenge is therefore a need to create a situation in which heat pumps can become the favoured choice for consumers. Government information and communication is vital, along with standardised information for the retrofitting process. **Will you commit to proactively raise awareness of heat pump technology as a viable alternative to conventional gas boilers? How, in your Heat and Building Strategy, will you explore the challenge of the mass adoption of heat pumps?**”*

We recognise that improving engagement with the public and consumers on low-carbon heating is critical to decarbonising heating and meeting our emissions targets. Low public awareness of the role of heating in emissions currently presents a key barrier to large scale deployment of low-carbon heating, despite public concern about climate change being at an all-time high.

Our ambition of deploying 600,000 heat pumps per annum by 2028 seeks to take advantage of the technology as currently the only proven scalable low-carbon heat technology to help kickstart the needed transition to low-carbon heating but this deployment will need to be supported by awareness raising activities to help consumers understand both the role of heating in carbon emissions and heat pumps as an option. Government, industry and others all have an important role to play in this.

Alongside awareness, clear and trusted advice needs to be provided to support consumers in transitioning to low-carbon heating solutions. We are actively working to understand how this service would be best provided. The SEA (Simple Energy Advice) website is an existing platform for digital advice and information and has been used to support the Green Homes Grant scheme. We seek to improve and build on the advice and services provided by this digital platform to ensure consumers can confidently make decisions for their homes on heating and energy efficiency.

Our Heat and Buildings Strategy will explore the need for a partnership approach in decarbonising homes, with roles for both government and industry. We believe that there is a key role for industry in engaging consumers over the next decade and bringing attractive products and consumer propositions to market, with important roles for government to ensure that the wider enabling environment and policy framework support this. The Strategy and accompanying policy consultations will set out the steps we plan to take to strengthen the incentives for industry to invest in innovating to develop supply chains and build a thriving consumer market for heat pumps.