

Written evidence submitted by the Green Finance Institute's Coalition for the Energy Efficiency of Buildings (DHH0071)

About the Coalition for the Energy Efficiency of Buildings

The Green Finance Institute was established in 2019 to mobilise capital and accelerate the domestic and international transition to a climate-resilient economy. The Institute convened the **Coalition for the Energy Efficiency of Buildings (CEEB)** for the purpose of developing the market for financing net-zero carbon and climate-resilient buildings. Formed of global experts from financial services, local and national governments, energy and construction industries, academia and civil society, under the chairpersonship of the Green Finance Institute's chief executive Dr Rhian-Mari Thomas OBE, the CEEB is a unique and powerful collaboration. The CEEB is supported by the environmental think tank, E3G, which provides secretariat capacity.

In 2020, the CEEB assembled the **Zero Carbon Heating Taskforce** to design, launch and scale the financing mechanisms needed to enable the rapid adoption of low carbon heating technologies, in individual buildings and entire districts, across the UK. The Taskforce involved a series of workshops to gain views from expert stakeholders across finance and industry. Insights from these sessions have been included in this response, and a report detailing the Taskforce's findings and new financial demonstration projects will be published later this year.

This response is compiled based upon reports and insights drawn from CEEB and Taskforce members but does not necessarily reflect the view of individual members of the coalition.

Summary of key points

The below key points are numbered to correspond to the terms of reference for the inquiry:

1. Current and past policies have seen some progress made to date on heat decarbonisation in the UK, but **further acceleration will be critical for achieving our net-zero targets**. Less than 2% of the heat pumps and 37% of heat networks that are needed are currently being installed each year.¹ **While the challenge is great, so too are the opportunities and benefits**. The drive to electrify heat is a climate priority among many major economies, presenting the UK an opening to develop a competitive advantage in smart energy systems, regulatory and financial innovation. At the same time, **green home retrofits can improve the lives of millions** through warm, healthy zero carbon housing. There is a **need for speed** to get on track for net-zero, with rapid deployment of readily available and scalable zero carbon heating solutions. Recent examples from the Netherlands and Scotland can be used to inform the UK's strategy. A **fabric-first approach** should be promoted, with energy efficiency works ensuring maximum impact of low carbon heating solutions. In addition, a holistic approach to design should be taken which includes **climate resiliency measures**, considering the likely impacts of flooding and heatwaves, and ensuring that retrofit and renovation measures support adaptation.
2. The CEEB warmly welcomes the announcement in the Prime Minister's **10 Point Plan** to target 600,000 heat pump installations per year by 2028. A long-term strategy and finance plan are now required to set out how this ambition will be achieved. The Heat & Buildings Strategy will be fundamental to provide the business and investor confidence needed to achieve scale in the low carbon heat market this decade. Urgent priorities include: **clarity on long-term policy outlook** with accompanying **targets** (including and in addition to the new heat pump goal); a **coherent national framework** that facilitates **local implementation** through 'zoning'; **phasing out gas boilers** within a clear timeline; a just, sector-specific **carbon price**; a **national delivery body** and **investment vehicle**; as well as **regulations and standards** aligned to support heat decarbonisation.
3. **Heat pumps and low carbon district heating solutions** should be rolled out as soon as possible in areas where they are currently feasible. Other technologies, including hydrogen, could play a role in the longer-term **but it is important to focus on existing solutions that can be delivered in the near-term** in order to get the UK on track to meet its carbon budgets and targets, while delivering on other social and environmental co-benefits.

¹ <https://www.ippr.org/files/2020-07/all-hands-to-the-pump-july20.pdf>

4. Major barriers to scaling up zero-carbon heating solutions include long-term **policy uncertainty**, disparity of economics between electricity and gas which **favours fossil fuels**, lack of **accessible and low-cost capital, low consumer awareness**, amongst others. Taskforce members highlighted that the **skills gaps and retraining** in themselves are not a large barrier, with the major barrier to upskilling instead being the lack of **long-term policy clarity and certainty of demand**, which is required to justify investments in training and skills. Consumer awareness is particularly important to encourage uptake. The Taskforce will publish more details on the barriers later this year and would be willing to discuss this further with the Committee.
5. To overcome these barriers, low carbon heating options must be made **economically viable**, levelling the currently uneven playing field that exists between gas and electrification. Policy for all housing tenures should also forward a **fabric-first approach** in order to achieve the most cost-effective reduction of emissions. **Carbon pricing** should be considered, crafted to ensure it does not disadvantage lower income households – building on recommendations from the Zero Carbon Commission.² Investing in **new green jobs** should be a focus of the green economic recovery, with studies suggesting that every \$1m spent on energy efficiency creates 7.72 full time jobs vs. 2.65 in fossil fuel industries³. A government-led **voucher scheme** could support such training opportunities.
6. The CEEB and Taskforce have conducted extensive work to establish required **incentives, barriers, “trigger points”** and pathways to maximise scale. Some of these are detailed in the response below, and more can be read in the CEEB Phase One Report⁴ and upcoming Taskforce report.
7. Low levels of consumer awareness and engagement on zero carbon heat are a key barrier to increasing demand and scale. **A government-backed engagement campaign should be prioritised**, delivered at a local level in partnership with the energy, retrofit and finance sectors. Government policies could influence this to be led by the energy companies themselves, if it were to be made the most economically viable option. **Building Renovation Passports** will greatly improve consumer choice and awareness of options. These will be further supported by the other policy recommendations set out in this response.
8. A **National Delivery Body** should be established to provide oversight and central coordination. Local and regional extensions should be established in due course in order to tap into local expertise, and implementation should ultimately be run by local authorities and delivery bodies.

1. What has been the impact of past and current policies for low carbon heat, and what lessons can be learnt, including examples from devolved administrations and international comparators?

To achieve the UK Government's net-zero targets, a near complete decarbonisation of heating by 2050 is critical. Past and current policies have not achieved the results required to meet this. The UK is on course to miss its 2020 targets for heating and cooling emissions reductions, achieving 7.5% reductions from 1990 levels (as of 2018) vs. target of 12% by 2020. Approximately 85% of homes and 65% of non-domestic buildings are still heated by natural gas in the UK.⁵ Less than 2% of heat pumps and 37% of heat networks that are needed are being installed each year.⁶

The challenge of decarbonising heat is UK wide: heating buildings accounts for 21% of the UK's greenhouse gas emissions, second only to transport. Currently, only 8% of the UK's heat is provided from renewable energy. A decision on substantive new action to decarbonise heat to 2030 is needed at the earliest opportunity for the UK to get on track for net zero, building on the decision to include heat pumps within the Green Home Grant scheme. This could provide an opportunity to support a long-term green recovery across the UK, boosting green jobs, manufacturing and supply chains.

² <https://zerocarbon.publicfirst.co.uk/>

³ <https://www.smithschool.ox.ac.uk/publications/wpapers/workingpaper20-02.pdf>

⁴ <https://www.greenfinanceinstitute.co.uk/wp-content/uploads/2020/06/Financing-energy-efficient-buildings-the-path-to-retrofit-at-scale.pdf>

⁵ <https://www.cbi.org.uk/media/5123/heat-policy-commission-final-report.pdf>

⁶ <https://www.ippr.org/files/2020-07/all-hands-to-the-pump-july20.pdf>

The Heat Pump Association estimates that there are over 100,000 registered gas engineers in the UK who are capable of retraining to deliver low carbon heating, given sufficient demand.⁷ In the past half-century, there has been a shift to central heating systems and industry must be prepared for another move in heating technology with extensive training on low carbon solutions. Businesses and investors require long-term policy signals to provide the confidence needed to invest in the required transition and retraining. Policy can stimulate both supply and demand side of the equation.

Taskforce members noted multiple examples of international best practice during recent workshops, with the Dutch example frequently cited. The Netherlands approach involves a nationwide long-term plan for phase-out and responsibility sitting with local authorities, with the nation divided into 30 regions that will develop Regional Energy Strategies. Taxes on natural gas will gradually increase, with taxes on electricity use decreasing to achieve a budget-neutral policy, to stimulate consumer demand. Clear targets are specified.

Scotland is another nation showing leadership on heat decarbonisation. The Scottish Government's programme for 2020/21, released in early September, pledges a total of nearly £1.6 billion to transform buildings, ensuring 'that emissions from heating are eliminated by 2040' and 'poor energy efficiency as a driver of fuel poverty' is removed.⁸ The Scottish Government set ambitions to at the very least double the rate of renewable heat installations in new and existing homes and buildings every year. Their ambitions in renewable heating will take the current baseline of just 2,000 installations per year in 2020 to 64,000 homes fitted in 2025 – a cumulative total of around 126,000 homes, representing 5% of Scotland's housing stock. Scotland is also establishing an expert group to make recommendations to Scottish Ministers on the scope of a potential heat pump sector deal.⁹ This policy framework and targets provide greater certainty of the road ahead for investors and markets, thereby fostering confidence to support the scaling of supply chains.

It is also of note that Scotland has shown leadership through establishing a net-zero mandate for its Scottish National Investment Bank,¹⁰ which could help provide the public finance required to de-risk and accelerate the deployment of additional private finance towards zero carbon heating systems and technologies. For more information on the potential role of a National Investment Bank, please see our response to question 2.

2. What key policies, priorities and timelines should be included in the Government's forthcoming 'Buildings and Heat Strategy' to ensure that the UK is on track to deliver Net Zero? What are the most urgent decisions and actions that need to be taken over the course of this Parliament (by 2024)?

BEIS' forthcoming Heat & Buildings Strategy will address heat and energy efficiency together, building on the call for evidence on 'Building the Market for Energy Efficiency' that was issued in the wake of the Clean Growth Strategy. Using the Green Homes Grant and the first tranches of the Public Sector Decarbonisation Scheme, Social Housing Decarbonisation Fund and Local Authority Delivery scheme as its launchpad, it needs to serve as the blueprint for decarbonising buildings for the next ten years – providing the long-term confidence and certainty required by investors and businesses to scale up supply chains, investing in skills and innovation.

The Strategy's scope is likely to be considerable. Below, we consider key elements this plan should contain, based on suggestions put forward via the Zero Carbon Heating Taskforce and based on the research and analysis of Coalition members. These have been grouped into matters concerning 1) Long-term governance frameworks; 2) Delivery measures; 3) Further measures to support delivery.

1. Governance: Long-term frameworks and targets to provide business and investor confidence

a. Target setting – science-based process for defining terms of deployment

⁷ https://www.heatpumps.org.uk/wp-content/uploads/2020/06/Building-the-Installer-Base-for-Net-Zero-Heating_02.06.pdf

⁸ <https://www.gov.scot/publications/protecting-scotland-renewing-scotland-governments-programme-scotland-2020-2021/pages/7/>

⁹ <https://www.gov.scot/publications/protecting-scotland-renewing-scotland-governments-programme-scotland-2020-2021/pages/7/>

¹⁰ <https://www.gov.scot/policies/economic-growth/scottish-national-investment-bank/>

There was strong consensus among Taskforce members that a long-term policy outlook, accompanied by targets and milestones, **would be essential to provide industry and investors the confidence and certainty to invest in the skills and technologies needed** to ensure a mass-market for smart, zero carbon heat – including heat pumps – this decade. With more confidence in short and long-term domestic demand, manufacturers and service providers can invest and flex their capacity to match¹¹.

The Prime Minister's 10 Point Plan provided a welcome uplift in ambition for green home retrofits and heat decarbonisation, including a new target to install 600,000 heat pumps per year by 2028. We note that while this is ambitious – and much higher than today's rate of installation – it falls below the number recommended by experts to get on track for net zero, with E3G suggesting the UK should be aiming for 10 million heat pumps by 2030 to get on track for net zero.¹²The 600,000 per annum target is however a welcome step in the right direction and will provide business confidence to scale supply chains and train employees.¹³

Additional targets could also be considered. The Energy Efficiency Infrastructure Group (EEIG) recommends to **bring forward the EPC C target for homes from 2035 to 2030** and introduce a new goal to **halve emissions from heating existing homes by 2030**.¹⁴ This would be commensurate with the pace of decarbonisation needed¹⁵, aligned with Scotland's ambition for heat¹⁶, and can be technically delivered in ten years – principally through heat pumps¹⁷. The CEEB similarly encourages energy efficiency and heat decarbonisation together as part of a complementary package. Increased energy efficiency will make heat decarbonisation cheaper due to lower energy demand, critical to stimulate consumer demand. It is also essential that houses being installed with heat pumps are well insulated, due to their lower running temperatures.

Again, this kind of target could provide a useful signal for industry and finance to mobilise behind.

b. System architecture (zoning) – process for identifying which technologies should be deployed where and when based on local opportunity and national infrastructure availability

The raft of decisions to be made through the Heat & Buildings strategy – as well as parallel decision making, such as the Future Home Standard, Net Zero Review, National Infrastructure Strategy and Energy White Paper – must collectively form a **coherent national framework**, which identifies the regulatory path ahead for 2030 and beyond. **This will be essential to provide the long-term confidence required by investors and markets to scale up and support the delivery of technologies, installations and skills required** to get the UK on track to meet its net zero goal, and interim target carbon budget targets to 2050.

The framework should recognise the '**need for speed**' - rapidly deploying solutions that are available and scalable today, such as heat pumps. Significant progress with currently available solutions over the next five years will keep the UK on course for net zero, while other technologies might emerge in later decades. See Question 3 for more details on technology. The national framework should also embed a 'fabric first' approach which progresses energy efficiency improvements, and also takes a sustainable approach to construction and retrofits, advancing solutions that are circular and resilient to anticipated future climate shocks (i.e. flooding and heatwaves). In 2021, the CEEB plans to explore the opportunity for innovative financial solutions to support the adoption of climate resiliency measures, and we would be pleased to discuss these plans in greater detail.

While certain policy decisions and regulations are best implemented at a national level – such as incentives and tax measures, or a potential carbon price – there is also a need for local governance mechanisms that spur local

¹¹ Chief Construction Adviser (2015) [Solid Wall Insulation: Unlocking Demand and Driving Up Standards](https://www.jstor.org/stable/resrep24949)

¹² <https://www.jstor.org/stable/resrep24949>

¹³ https://www.jstor.org/stable/resrep24949?seq=1#metadata_info_tab_contents

¹⁴ https://www.theeeig.co.uk/media/1098/eeig_report_turning_stimulus_into_recovery_pages_0920.pdf

¹⁵ By eliminating 45% of today's emissions by 2030 to limit global warming to 1.5°C. See IPCC (2018) [Global Warming of 1.5°C](https://www.ipcc.ch/report/ar5/wg2/).

¹⁶ Scotland is seeking to fully eliminate emissions from heat buildings by 2040. See Scottish Government (2020) [Protecting Scotland, Renewing Scotland](https://www.scotland.gov.uk/topics/energy/energy-strategy).

¹⁷ Modelling for the National Infrastructure Commission finds that the combination of energy efficiency and heat pump deployment can reduce emissions from heating buildings by 44% by 2030. See Element Energy (2018) [Cost analysis of future heat infrastructure options](https://www.elementenergy.com/reports/cost-analysis-of-future-heat-infrastructure-options).

leadership which helps scale up innovations and supply chains for zero carbon heating. There is a growing consensus that different approaches to decarbonisation will be needed to **reflect regional variation and assets** – including through Local Area Energy Planning,¹⁸ Heat and Energy Efficiency Zoning,¹⁹ and Local Industrial Strategies that support a just transition.²⁰ Since no ‘one size fits all’ solution is appropriate for decarbonisation, it is therefore also likely that the structures required for delivery will also vary. Nonetheless, there is still a role for central government supporting regional implementation through the provision of good practice frameworks, with minimum requirements regarding robust governance, independent scientific rigour and social indicators.

Zoning considers the most appropriate heat decarbonisation and energy efficiency solutions for any given area through a consultation process with local stakeholders.²¹ Local authorities can identify specific areas with high potential for heat networks, or other solutions. This in turn could encourage the development of innovative business models and financing approaches, helping Local Authorities and social landlords aggregate demand for projects in specific areas, which could help increase access to lower cost finance. In a welcome move, BEIS has announced it will consult on a framework for heat network zoning in Spring 2020.²² The Heat & Buildings Strategy can cement this approach, signalling governance arrangements that will support a locally led approach for the Strategy’s implementation, learning and refinement.

The success or failure of locally led initiatives can depend on the assurance of a long-term government roadmap and financing plan to **ensure local capacity**. The results from the Green Deal Communities programme, which supported local authorities in promoting Green Deal take-up, were disappointing and enhanced local take-up has not persisted.²³ The extremely short time-scales for local authorities to apply for, and spend, the funding available played a significant role in this failure. A significant, if anecdotal, downside to this experience is a perception amongst some stakeholders that local authorities are not effective at delivery. Many clearly are effective and have repeatedly been able to secure and deploy energy efficiency funding effectively.²⁴

We note that it will be important that government departments are **adequately capitalised** to deliver on this long-term roadmap. The EEIG calculates that **£5.8 billion of public capital** should be allocated in Treasury’s Spending Review towards supporting heat pumps deployment in existing homes, drawn from the £100 billion infrastructure budget for this Parliament. BEIS should engage with Treasury on the amounts required for different departments to underpin the review.

c. Capacity support: National Delivery Body – central repository of knowledge to help local delivery initiatives

At present, a major barrier to scaling up zero carbon heating solutions at a local level is the lack of capacity and expertise among Local Authorities. A **National Delivery Body could help advise Local Authorities** and other actors, such as Local Economic Partnerships – providing scientific, financial and technological advice. As well as incorporating environmental measures, evidence bases should incorporate social factors, including but not limited to wellbeing, the just transition and green employment opportunities. The body could also help coordinate specific schemes identified through the Taskforce’s working groups – for instance, Demand Aggregation Financing. Further suitable schemes will be outlined in the upcoming Taskforce report.

The CEEB members recommended **robust governance processes** that should be mandated for the development of regional heat targets, plans and evaluation – with independent and scientific support provided by Government. Regional variation between metrics and approaches for measuring and assessing economic

¹⁸ <https://es.catapult.org.uk/wp-content/uploads/2018/12/Local-Area-Energy-Planning-Guidance-for-local-authorities-and-energy-providers.pdf>

¹⁹ <https://www.theade.co.uk/resources/publications/heat-and-energy-efficiency-zoning-a-framework-for-net-zero-for-new-and-exis#:~:text=The%20Zoning%20Framework%20is%20based,and%20technologies%20to%20do%20so.>

²⁰ https://neweconomics.org/uploads/files/NEF_trust-in-transition.pdf

²¹ <https://www.theade.co.uk/news/press-releases/right-place-right-stuff-gov-to-put-local-areas-in-charge-with-zoning-consul>

²² <https://www.theade.co.uk/news/press-releases/right-place-right-stuff-gov-to-put-local-areas-in-charge-with-zoning-consul>

²³ https://www.e3g.org/wp-content/uploads/E3G_2018_07_Silver_buckshots.pdf

²⁴ https://www.e3g.org/wp-content/uploads/E3G_2018_07_Silver_buckshots.pdf

prosperity can be supported in so far as they meet minimum criteria (i.e. alignment with the Paris Agreement, just transition principles, etc.).

2. Delivery regulations: Stimulating project pipeline

a. Fiscal measures: including carbon pricing, levelling the playing field

Currently, zero carbon heating systems, such as heat pumps, compete on an unlevel playing field due to a regulatory framework and incumbent market that favours gas, with existing 'sunk costs' in fossil infrastructure. During Taskforce workshops, it was suggested that a carefully considered carbon price could help change the economics to reflect the carbon savings that can be achieved through heat pumps. This would need to be set up in way which does not adversely impact fuel poor and lower income households, with additional support and measures to ensure access and availability of zero carbon heating systems. The **recommendations of the Zero Carbon Commission**, on which the Green Finance Institute was a commissioner and actively contributed towards the set of recommendations, should be considered to achieve this.²⁵ The Commission outlines a clear carbon price trajectory with a sectoral differentiated approach, including specific recommendations for its introduction in the heating sector.

Taskforce members also suggested that the cost of conversion from fossil fuel-based systems to zero carbon heating infrastructure should be incorporated into **infrastructure costs and bill plans**.

b. Standards and regulations, including gas boiler phase out dates

Zero carbon heating needs to be embedded in regulation and standards that encompass green home retrofits, ensuring that all frameworks are complementary and support the heat transition. A **comprehensive review of current standards and regulation** should be undertaken to achieve this.

For instance, **Energy Performance Certificates (EPCs)** can currently discourage the shift towards heat pumps and instead favour low cost gas.²⁶ BEIS has signalled revisions will be made through the EPC Action Plan, and these should reflect the adjustments needed for heat decarbonisation.

Scientific leadership can also ensure the UK's recovery and net zero transition are environmentally and socially sustainable: there is a need to embed **sustainable and circular design into the materials and products** used to decarbonise homes. The UK can show leadership through reflecting these considerations in the forthcoming Heat & Buildings Strategy and Industrial Strategy activity. To name just a few considerations, this could include a review of embodied carbon;²⁷ circular design and construction; a review of potential toxic or harmful chemical and substances; and accelerated phase-out of F-gases in heat pumps²⁸. These measures should also contain climate resiliency, considering how retrofits and construction can make our homes more robust to the anticipated impacts of climate breakdown, such as flooding and heat waves. This could include considerations such as water savings, passive cooling and green roofs.

The Future Home Standard should mandate that all new homes are zero-carbon – built to high standards of energy efficiency and installed with zero carbon heating solutions. The CEEB welcomes reports that this will be bought forward to 2023 as part of the Prime Minister's 10 Point Plan and looks forward to formal confirmation that this will include a phase out of gas boilers in new builds. Currently, the rate of homes being connected to the gas grid far outstrips the number with zero carbon heating solutions. The call to ban gas boilers is widely supported – including by a Heat Commission convened by the CBI and University of Birmingham, supported by leading industry figures, who recommend a ban from 2025²⁹. Similarly, members of the Zero Carbon Heating Taskforce identified this measure as a simple but effective means of putting the UK on track for heat

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<https://static1.squarespace.com/static/5e1ee218fbeca217fe06a421/t/5f67b4bcc9621301a2109c9c/1600632008945/Zero+Carbon+-+How+carbon+pricing+can+help+Britain+reach+net+zero+emissions+by+2050.pdf>

²⁶ <https://foresightdk.com/energy-performance-certificates-hold-back-heat-decarbonisation/>

²⁷ LETI (2020) *LETI Embodied Carbon Primer: Supplementary guidance to the Climate Emergency Design Guide*

²⁸ Environment Agency & Defra (2019) *Bans on F gas in new products and equipment: current and future*

²⁹ <https://www.cbi.org.uk/media-centre/articles/no-new-conventional-gas-boilers-in-homes-after-2025/>

decarbonisation, **providing investor confidence to increase investment in zero-carbon heat companies and supply chains.**

c. Stimulus measures: Sustaining longer term recovery

The CEEB recognises the intention to mobilise the supply chain rapidly for the Green Homes Grant, and issue vouchers before April 2021. However, the Green Homes Grant should not preclude the possibility of the physical retrofit projects continuing for up to 18 months, with a potential extension up to two years for more complex projects. This consideration will be even more important should the country go into a second pandemic-induced lockdown. The CEEB welcomes the decision in the 10 Point Plan to extend the Green Homes Grant, catering for uncertainty, and maximising the benefits for households and businesses. Signals around future support after the scheme expires are also critical and Taskforce members highlighted that investing in scaling-up supply with a guarantee of further demand is preferable.

d. Consumer protection regime: ensures high quality of service to maintain consumer confidence

In order to develop new markets and scale finance for zero carbon heating solutions, it will be essential to ensure consumer confidence, particularly around quality, value and safety. A robust consumer protection regime can help ensure this.

e. Local authority initiatives with social housing, addressing fuel poverty

The Fuel Poverty Strategy could act as a heat transition strategy, working to ensure that no households are left without access to warm and healthy zero carbon homes. Local Authorities and social landlords should be equipped to scale up zero carbon heating solutions in low income households. This in turn can spur the innovation and scaling of supply chains that bring down costs in a way that everyone benefits from, therefore also supporting the 'able to pay' market.

f. Public sector commitments with the government estate

In addition to social housing, public sector commitments to decarbonise heating in public buildings can also support and scale supply chains, helping achieve economies of scale and boosting local supply chains and jobs. The Government can build on the Public Sector Decarbonisation Scheme to further roll out zero carbon heating solutions in public buildings.

3. Supporting measures to ensure a long-term, sustainable delivery of solutions

a. Supply chain support: Heat Pumps Sector Deal

Supply chain development could be boosted by a heat pumps sector deal – analogous to that for the offshore wind industry. A Sector Deal could support innovation and manufacturing outside of London and the South East, therefore contributing to the Government's levelling up priority. For instance, there is currently a heat pump manufacturing plant located in Livingston, Scotland which the Scottish Government is currently exploring as an 'anchor' location for a Sector Deal. In England, Kensa, a British firm, manufactures ground source heat pump systems in Cornwall. A sector deal can be designed to support UK criteria for economic stimulus in response to the economic crisis induced by the coronavirus pandemic, building on the insights of other sector deals, BEIS' current heat electrification demonstration project, and lessons from Scotland and the Netherlands on the development of local government leadership in planning for heat decarbonisation. In both the Scottish and Dutch scenarios, local heat planning is across the residential, commercial and public sectors, integrated with energy efficiency, and supported by national government investment and resources. The UK can strengthen its place in the world and attract world-leading expertise on zero-carbon heating through launching a long-term Heat Pumps Sector Deal to attract foreign direct investment for the manufacture and installation of zero carbon heating solutions across this decade.

b. Education, training and engagement

Participants in the Taskforce identified low public awareness regarding zero carbon heating solutions – as well as lack of knowledge regarding the contribution of UK homes to greenhouse gas emissions – as a barrier to the rapid decarbonisation of heat. Recent studies have shown that despite growing public concern about the climate

emergency, awareness of gas boiler alternatives such as heat pumps remains low.³⁰ **Improved education and public engagement campaigns** could help reduce this problem, thereby helping to stimulate demand for zero-carbon technologies and creating an environment for financial institutions to innovate new green finance products.

There will also be a role for increasing skills and awareness among the zero-carbon heating value chain – from boiler installers, through to finance institutions. For instance, the Taskforce is currently exploring a demonstrator project that will provide a ‘two-way FAQ’ or toolkit for financial institutions and those involved in manufacturing and delivery of zero carbon heating systems, to help reduce the knowledge gap. We would be pleased to discuss this project further.

There is an opportunity to support the just transition through retraining boiler installers and maintenance workers with the skills needed to support the rapid deployment of zero carbon heating across the country. Investing in building **new green jobs** should be a focus of the economic recovery, given the high jobs multiplier effect from building retrofits, with studies suggesting that every \$1m spent on energy efficiency creates 7.72 full time jobs vs. 2.65 in fossil fuel industries.³¹ BEIS can work with the Department for Education, TrustMark and relevant industry trade bodies to develop a commensurate plan to meet the zero-carbon skills needed.

Building Renovation Passports (BRPs) can play a critical, enabling role in increasing education and engagement around green home retrofit options, including for zero carbon heating. BRPs provide historical and contemporary information about a property, forming a digital logbook of renovations measures and performance. Clear, accessible and affordable information that is bespoke to individual buildings would bring benefits along the retrofit supply chain. Homeowners can make informed decisions that align with a net-zero trajectory, installers can fit measures that complement existing technologies in the home, and lenders can assess risks and support customers in a more accurate manner. BRPs are commonplace in other countries, including Germany, Belgium and France, and can be adapted to encompass buildings across all housing tenures. There is growing support behind the widespread adoption of BRPs in the UK as part of the transition towards zero carbon buildings. The UK’s Climate Change Committee³² has recommended their uptake, as has the Association for Decentralised Energy³³ and others³⁴.

A BRP should highlight the appropriate zero carbon heating solutions for the property. Participants of the Coalition’s Zero Carbon Heating Taskforce suggested that BRPs could be used, for example, to notify homeowners if a district heating network was in place or planned in their area, thereby encouraging a greater number of connections. It could also notify homeowners if their homes were insulated to a level necessary to accommodate a heat pump. It could also link homeowners to supply chain actors who can deliver these solutions, as well as public and private funding opportunities to underpin them.

The CEEB has assembled a working group to develop an initial standardised framework for introducing BRPs in the UK and would be pleased to share the findings from a recent cross-sector stakeholder consultation.

c. Network infrastructure (e.g. aligned delivery of smart, flexible power network)

Concerns have been expressed that shifting load from fossil fuels (e.g. oil, LPG and ultimately mains gas) will unduly increase the strain on the electricity grid beyond its capacity – particularly at peak times. This could be further exacerbated if additional load from electric vehicles is added. Smart and flexible grids could mitigate the risks associated with additional grid load. The National Infrastructure Commission said a “smart power

³⁰ <https://www.gov.uk/government/publications/transforming-heat-public-attitudes-research>

³¹ <https://www.smithschool.ox.ac.uk/publications/wpapers/workingpaper20-02.pdf>

³² <https://www.theccc.org.uk/2019/02/21/uk-homes-unfit-for-the-challenges-of-climate-change-ccc-says/>

³³ <https://committees.parliament.uk/writtenevidence/8684/html/>

³⁴ Independent Review of Building Regulations and Fire Safety: final report, (Chapter 8). Dame Judith Hackitt: May 2018, following the Grenfell Tower fire to make recommendations on the future regulatory system; <https://www.gov.uk/government/publications/independent-review-of-building-regulations-and-fire-safety-final-report>; and Living with Beauty: promoting health, well-being and sustainable growth. BBBC: January 2020 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/861832/Living_with_beauty_BBBBC_report.pdf

revolution“, making use of interconnectors to other countries, flexible demand and electricity storage, could keep these costs to a minimum, potentially saving up to £8bn a year by 2030.³⁵ In a flexible grid, supply from batteries and demand flexibility could help reduce peak demand, so that fewer peaking power plants – designed to operate for a few hours at a time when demand is highest – would be needed. This would also cut the cost of fuel needed to run these plants and the carbon costs of their emissions.

BEIS can work with Ofgem and energy companies to work towards these solutions. Flexible tariffs for heat pumps can be offered to consumers to help lower costs and impact on the grid, as seen for example with Good Energy.³⁶

4. Additional steps that BEIS might seek to signal in the Heat & Buildings Strategy – although may be outside its direct scope – include the following:

a. National Investment Bank

The UK has a well-established set of institutions to determine infrastructure investment needs and to ensure that infrastructure projects are delivered to budget, but which are being undermined by the current uncertain environment. There is a need for an institution which can bridge the gap between policy and investment, and between top-down finance and bottom-up projects.

A new National Investment Bank for the UK, to co-create new investable asset classes and channel both public and private capital towards defined net-zero outcomes, could support the government in providing a short to medium-term stimulus to the economy. This helps to meet wider goals, such as increasing income by creating jobs, boosting long-term productivity, levelling up the economy and increasing resilience. Public finance could be used to seed the investment bank, helping to finance investments currently viewed as unattractive to the private sector, and crowd-in additional finance to maturing markets. The leverage effect experienced by the Green Investment Bank is testament to the impact such a bank could have, as for every £1 invested by the Green Investment Bank, a corresponding £2.50 of private capital was invested³⁷. To give a specific example regarding investments in energy efficiency, for every €1 invested by Germany’s national infrastructure bank KfW to incentivise energy efficient renovation through interest rate and capital subsidies in 2016, building owners were motivated to borrow and spend €6³⁸ – while the federal government has nearly recouped its outlay through increased VAT revenue alone.³⁹

Specifically, for buildings decarbonisation, it can pave the way for private finance offers⁴⁰ to flourish, lowering their cost and increasing their availability by absorbing initially riskier investments – essential to increasing private investment and reducing subsidy levels over the longer-term. It can also identify, develop and standardise investment propositions, leading and monitoring investment flows to regions that need it most, while playing a critical role in the governance of a long-term energy efficiency and heat strategy.

3. Which technologies are the most viable to deliver the decarbonisation of heating, and what would be the most appropriate mix of technologies across the UK?

³⁵ <https://www.carbonbrief.org/uk-needs-a-smart-power-revolution-says-infrastructure-commission>

³⁶ <https://www.renewableenergyhub.co.uk/blog/good-energy-to-introduce-first-home-heat-pump-tariff-in-the-uk/>

³⁷ <https://www.nao.org.uk/wp-content/uploads/2017/12/The-Green-Investment-Bank.pdf>

³⁸ Calculated from Institut Wohnen und Umwelt & Fraunhofer Institut (2018) Monitoring der KfW Programme „Energieeffizient Sanieren“ und „Energieeffizient Bauen“ 2016; BfM (2016) Haushaltsgesetz 2016

³⁹ Added to this are less directly accountable increases in income and corporation tax revenues, and employer and employee social security contributions Cambridge Econometrics & Verco (2014) Building the Future: The economic and fiscal impacts of making homes energy efficient, which should easily make the investment revenue-positive.

⁴⁰ See GFI (2020) [*Financing energy efficient buildings: the path to retrofit at scale*](#)

There are various technological options for decarbonising heat, all of which will have a role to play at different times and geographies. The **technology landscape is fast evolving and there is no 'one size fits all' solution**. A governance process is needed to help make the choices about which technologies should be deployed where and when, with decisions supported for instance by a **National Delivery Body** (see response to question 2). A risk-based approach is needed – avoiding betting on future technologies that might not work, but rather getting on with deployment now with those technologies readily available in places which there is limited risk of foreclosing future options.

The general response from Coalition members was the government should focus on energy efficiency measures and heat electrification as near-term solutions. New, consolidated academic research by UKERC finds **energy efficiency, heat pumps and district heating comprise the most effective investment pathway for heat decarbonisation for the next 10 years**.⁴¹ Independent climate think tank E3G suggests that the deployment of 10 million heat pumps by 2030, alongside energy efficiency improvements and the deployment of heat networks, can drive rapid reductions in CO₂ emissions from heat.⁴² Illustrative scenarios developed for the National Infrastructure Commission show how, compared to business as usual (BAU), heat pumps deployed at this scale could cut cumulative heat-related emissions from buildings to 2030 by 25%, with in-year emissions in 2030 44% lower than under BAU – broadly in line with what climate science requires.⁴³

The Coalition members agreed that **fossil gas heating needs to be rapidly phased out** to put the UK on track to meet its net zero target. Gas is a fossil fuel which releases CO₂ when combusted for use in heating systems, with additional greenhouse gases arising from upstream methane leakages - which are commonplace (and often under reported) higher up the supply chain.⁴⁴ The role of **hybrid heat pumps is currently debated by the sector**, with some fearing it could delay the longer-term transition to non-hybrid heat pumps. One Taskforce member noted that many hybrid heat-pumps are too small to be fully zero carbon, and so their mass roll-out could tie in fossil fuel usage over their lifespan (10 – 15+ years) or increase the risk of installing undersized heat pumps which will require replacing in the future. Others see them as having a potential role to play in the transition period, helping people move over soon and normalising zero carbon heating solutions. **If hybrid heat pumps are to gain mass market, it is important that they are suitably sized to handle the full electricity load required.**

Currently in the UK, heat network connections are being pursued in dense urban areas, mainly in new developments, supported by the Heat Networks Investment Project (HNIP). The Renewable Heat Incentive (RHI) has supported a low level of deployment of heat pumps, biomass boilers and solar thermal systems mostly in commercial buildings and rural, off-gas homes. The RHI recorded approximately 11,000 installations in 2019, compared to 60,000 customers connected to the gas grid each year.⁴⁵

Each technology comes with its own opportunities and challenges. A challenge they all share is that supportive policies and deployment are far from commensurate with the scale and pace of decarbonisation needed. Another shared theme is the central role energy efficiency improvements need to play to reduce heat loss and the cost of keeping warm.⁴⁶ The replacement of fossil-fuelled heating systems with low-carbon alternatives requires considerably more investment, in which energy efficiency upgrades will play a crucial role in keeping costs to a minimum. Without all appropriate efficiency improvements, the cost of heat decarbonisation could be £6.2 billion higher per year to 2050.⁴⁷

The illustrative scenario for hydrogen at scale – 'blue' hydrogen, produced using natural gas with steam methane reforming plus carbon capture and storage (CCS) – takes longer to reach scale and maturity.⁴⁸ Furthermore, the

⁴¹https://d2e1qxpsswcpgz.cloudfront.net/uploads/2020/09/The_pathway_to_net_zero_heating_UKERC_briefing.pdf

⁴² https://www.jstor.org/stable/resrep24949?seq=7#metadata_info_tab_contents

⁴³ https://www.e3g.org/wp-content/uploads/07_07_20_E3G-briefing-10m-heat-pumps-for-homes-by-2030.pdf

⁴⁴ http://priceofoil.org/content/uploads/2019/05/gasBridgeMyth_web-FINAL.pdf

⁴⁵ ENA (2015) Guide to the UK and Ireland energy networks

⁴⁶ Without energy efficiency, the costs of decarbonising heat have been estimated to be £6.2 billion higher per year to 2050. See Imperial College London for the CCC (2018) Analysis of Alternative UK Heat Decarbonisation Pathways

⁴⁷ Imperial College London (2018) Analysis of Alternative UK

⁴⁸ 'Green' hydrogen is produced using electrolysis with renewable power, an energy carrier needed to fully decarbonise the economy and may have a role to play in decarbonising heat for buildings. However, it not considered viable at this scale, primarily owing to the better value applications the additional renewable power that would be required could be used for (such as electric heat), as well as the other applications for it that would take precedence (industry, freight).

‘green hydrogen’ that would be compatible with a zero-carbon trajectory is anticipated to be a scarce resource and should be prioritised for ‘hard to abate’ sectors such as heavy industry, transport and freight. Lessons may be learnt from the ‘Hydrogen Town’ announced in the 10 Point Plan, to better understand the costs and feasibility of using hydrogen in homes at scale.

Overview of main technologies for zero carbon heating

Technology and current deployment	Suitability and scalability
District Heating – around 17,000 heat networks which supply nearly 500,000 consumers, ⁴⁹ accounting for around 2% of domestic heat	District heating schemes require a high density of heat demand to be economic, therefore are suitable for urban areas, new build developments and some rural areas. The Government estimates that 14-20% of UK heat demand could be cost-effectively met by heat networks by 2030 and 43% by 2050. ⁵⁰
Heat pumps – the UK has approximately 210,000 heat pumps, of which, roughly 175,000 were air-source.	Air source heat pumps (ASHPs) absorb heat from the outside air to heat homes and hot water. Ground source heat pumps (GSHPs) use pipes buried to extract heat from the ground. A house will require outside space and an adequate level of insulation to be fitted. GSHPs are better suited to houses with access to gardens or outside space. Shared ground loop arrays can connect multiple dwellings to a GSHP system. The CCC estimates that there are 10m on-grid homes suited for heat pumps and a further 10m+ with potential with additional insulation, and 1.6m owner-occupied homes off the gas grid technically suitable for a heat pump ⁵¹
Biogas – The Green Gas Certification Scheme noted that 1 million homes were using biogas in 2019 ⁵²	Biogas is produced through the process of anaerobic digestion of organic materials, such as agricultural and food waste. It’s ‘green’ credentials can depend on methane leakage and source of biomass – for instance, commodity crops can be associated with sustainability concerns. Nonetheless, for a number of off-grid rural homes – particularly those with access to consistent biomass waste streams – this technology could be an option.
Hydrogen	Use of hydrogen in homes is still at an early stage, with feasibility studies still required to prove safety and determine the required technology and infrastructure upgrade. ‘Green’ hydrogen – derived from non-fossil sources – is currently a scarce resource, representing around 1% of the total. ⁵³ Green hydrogen may be a less efficient heating source than electrification. Estimates suggest that powering the UK road freight would require 3,500 wind turbines, whereas green hydrogen would require 12,000. ⁵⁴ The cost required to upgrade the infrastructure network, and the feasibility of supplying 100% green hydrogen to homes, is currently unknown.

E3G notes that deploying 10 million heat pumps to 2030, while consistent with climate science and the need for UK leadership, is undoubtedly a major challenge. The think tank suggests that the lowest regret pathway to deploying heat pumps to 2030 at this scale must begin with:⁵⁵

- **Energy efficiency:** making all UK homes highly energy efficient by 2030, reducing the cost to households of decarbonised heat and rapidly increasing the pool of properties suitable for heat pumps to achieve optimal performance.

⁴⁹ ADE (2018) Bringing Energy Together

⁵⁰ ADE (2018) Bringing Energy Together

⁵¹ <https://www.theccc.org.uk/wp-content/uploads/2018/06/Imperial-College-2018-Analysis-of-Alternative-UK-Heat-Decarbonisation-Pathways.pdf>

⁵² <https://www.greengas.org.uk/news/1-million-homes-now-on-green-gas-tariffs>

⁵³ <https://www.fchobservatory.eu/>

⁵⁴ <https://www.thetimes.co.uk/article/fossil-fuel-companies-misleading-prime-minister-on-green-hydrogen-j7v6wnn6q>

⁵⁵ https://www.jstor.org/stable/resrep24949#metadata_info_tab_contents

- **New build:** ensuring new homes are net zero compatible should start right away. From 2025 at the latest, ideally sooner, the Future Homes Standard will rule out fossil heating in new homes. The size of the opportunity for deploying low carbon heat in new homes – through heat networks and heat pumps – will amount to between 1.6 and 3 million dwellings to 2030.
- **Off-gas properties:** there are approximately four million homes in the UK in this category, which have been the mainstay of domestic RHI deployment to date. Over half of these could be currently suitable for heat pump deployment, more so in conjunction with the manifesto-pledged Home Upgrade Grants for energy efficiency improvements for low income households living in very inefficient homes.
- **On-gas, post-war, suburban houses:** typically reasonably efficient, these homes could also be a priority for heat pump deployment, potentially also as hybrid heat pump systems to begin with – combining with a gas boiler to meet peak heat demand using low carbon gas in future, leaving the heat pump to provide over 80% of the heat in this type of home. In England, there are 11 million homes in this category.

Given the likely mix of technologies, consumer engagement and education will be key for ensuring the right steps are taken at the right time. Building Renovation Passports could play a role in supporting this, providing homeowners with a logbook of previous measures, and a flexible roadmap outlining the steps they could take to put their homes on track for zero carbon. This could help flag appropriate heating solutions – for example, if there was a heat network in the district that their home could be connected to. It could also inform consumers of private and public funding options that could support installation costs.

As previously noted, the design standards that underpin any technological approach and design should also embed sustainability and circularity, as well as climate resiliency.

4. What are the barriers to scaling up low carbon heating technologies? What is needed to overcome these barriers?

The Taskforce was assembled to identify key barriers to scale up low carbon heating technologies and to create innovative financial solutions and non-financial enablers to overcome these barriers. These will be published in detail in a report later this year and we would be happy to discuss further.

Lack of long-term clarity on targets and timelines from regulations and policy

Taskforce members noted companies and investors **require long-term policy and regulatory clarity in order to scale business to the levels required to achieve decarbonisation**. Manufacturers and installers need this to underpin increased investment in technologies and in training employees, as well as identifying the locations that supply chains should be scaled up. Investors require long-term clarity given the long-term nature of the businesses. Those investing in district heating noted that lack of clarity on the UK's roadmap for heat decarbonisation means that it is hard to ascertain the future size of the investment opportunity in this space and the specific technologies to support in the near-term.

A clear pathway will also give investors the confidence that demand will follow from households – this could be achieved through **mandating removal of all gas boilers with a clear timeline**, similar to the ban on ICE vehicle sales. Policies thus far have been focussed on voluntary transition, and the scale of installations has been much lower than the level required to achieve net-zero targets. This will also allow businesses to adequately prepare and scale-up in advance. A target annual installation rate for heat pumps and district heat networks would also aid this. **Removing uncertainty on near-term plans for hydrogen in homes** would further alleviate worries and restore investor confidence. For district heating, **the introduction of zoning** and identification of district heating zones, potentially with mandatory connection, coupled with **a national delivery body and national investment bank / district heat fund** would help rapidly scale this market, with private capital ready to invest but awaiting the correct signals and regulatory environment.

Levelling the playing field for the electrification of heat

Currently, the electrification of heating for net zero competes on an unlevel playing field, due to the power of incumbent fossil fuel-based systems, as well as government tax breaks and other forms of support. This can be

mitigated through exploring the introduction of a rising **carbon tax** on natural gas, coupled with **compensatory measures for low income households** to ensure no adverse effects for households in fuel poverty – to level the playing field for efficient electric heat and therefore supporting the development of the market for zero carbon heating manufacturing and skills. Taskforce members noted this as a key barrier to making projects economically viable across all current leading technology types.

Access to adequate levels of low-cost capital to address up-front costs

Access to capital applies to both individual consumers and businesses. The Taskforce and wider CEEB are working to bring **a suite of new innovative financial options to the market**, to aid with the transition. Lack of affordable options for individual homeowners has limited installations to those in the able-to-pay market, whilst also dissuading large landlords from investing in the transition as a priority. The Taskforce and its members aim to deliver financial solutions and non-financial enablers to market to address this and would be pleased to discuss these solutions in greater detail with Government.

Low levels of consumer awareness

Taskforce members cited consumer education and awareness as an important barrier to increased demand. This covers multiple areas, including their understanding of the scale of transition required, technology and financial options available, benefits of the new technologies, potential cost savings, and busting myths associated with old fossil fuel boilers and new solutions. A recent BEIS report conducted a survey to understand the public's awareness and knowledge of the required future transition to low-carbon heating in homes, which confirmed the need for education.⁵⁶ Nine out of ten respondents showed strong support for reducing carbon emissions and introducing targets for reductions, and specifically targets for heating. However, public knowledge of heating was very low, and **37% said they had 'never heard of the ambition to eliminate nearly all heat from buildings**, and only 3% said they 'know a lot' about this ambition. **General knowledge of heating's role in releasing carbon emissions was low**, many did not know heating in buildings is one of the largest contributors to UK carbon emissions, and only a small portion reported having heard of specific low-carbon heating technologies.

A government-backed public marketing campaign should be prioritised, delivered at a local level by trusted sources and supported by the energy, retrofit and finance sectors. A campaign led by energy companies would follow naturally if government were to introduce the long-term policy clarity and carbon pricing recommendations referenced earlier. For consumer choice, the introduction of **Building Renovation Passports** would allow easy access to advice on the financial and technological options available. This could be coupled with zoning policies to increase consumer awareness on the choices available in their specific area (e.g. if they are in a designated District Heating zone, the Passport would inform them of the opportunity to connect to the network when their boiler needs replacing). Assurances should be given on: disruptive aspects of installation, progress made to avoid mis-selling, poor installations and Section 75 liabilities (e.g. through quality standards such as MCS and TrustMark), and availability of supply chain. The latter will be aided by a clear long-term policy roadmap. Building Renovation Passports could also be supported as a tool to increase awareness of heat pumps as a measure that property owners can install to decarbonise their homes, with links to supply chains and public and private funding sources.

Fabric-first approaches should be recommended, to ensure cost savings are achieved, and also the greatest emissions reductions. Many consumers are currently not opting to move to low carbon solutions due to the increase in their bills. A carbon price would also help overcome this barrier by increasing the bills associated with continued fossil fuel boilers use.

- 5. How can the costs of decarbonising heat be distributed fairly across consumers, taxpayers, business and government, taking account of the fuel poor and communities affected by the transition? What is the impact of the existing distribution of environmental levies across electricity, gas and fuel bills on drivers for switching to low carbon heating, and should this distribution be reviewed?**

⁵⁶ <https://www.gov.uk/government/publications/transforming-heat-public-attitudes-research>

Resources should be allocated on the basis that they minimise total system costs thereby maximising value for consumers as a whole. This means following the heat hierarchy with energy efficiency first and direct energy sources reserved for needs that cannot be met cost-effectively through waste heat recovery or upgrading heat. Costs should be implemented via a new governance framework that ensures the use of consistent and up to date technical assumptions and whole system planning.

Beneficiaries should be expected to pay for their heating services to minimise any cost burden on those that are unable to act quickly, but public financial support should be sufficient to retain strong incentives to act. Energy consumers who are unable to pay or take advantage of the opportunity for other reasons should receive additional support to adopt low carbon heating solutions in line with an overall strategy to end fuel poverty. The Coalition and Taskforce are developing innovative financial solutions, predominantly for the able-to-pay market, that are applicable for different tenures.

Furthermore, the system should put the consumer at the heart, ensuring a comprehensive offer is available to consumers that meets all their needs and retains their ability to choose. The offer should involve:

- i. Fair price for installation and subsequent energy consumption
- ii. Modern heating systems taking advantage of digital technologies
- iii. Convenience and minimisation of disruption
- iv. Excellent service throughout installation and thereafter
- v. Clarity of options available to ease the customer journey

A consumer protection regime should ensure compliance with these requirements.

We note an important role for public and private finance in supporting the distribution of costs. Financial innovation and the development of new products and services can help leverage additional private finance from the 'able to pay' market, which can be incentivised further through measures such as the Green Home Grant, Renewable Heat Incentive and future stimulus actions. A new National Investment Bank could also support blended finance solutions through providing zero- and low-interest loans to consumers to support the purchase of zero carbon heating systems.

As previously mentioned, carbon pricing could play a role in levelling the playing field between gas and electric heating, but only if introduced in a way which does not adversely impact the fuel poor.

6. What incentives and regulatory measures should be employed to encourage and ensure households take up low carbon heat, and how will these need to vary for different household types?

The cost of decarbonising heat should be spread based on ability to pay – with incentives that become self-sustaining for the able to pay and continued help for lower income households to ensure no one is left behind. As a starting point, the Government can extend and build upon the Green Home Grant, which provides £5,000 to households towards the costs of green home retrofits (including low carbon heating solutions) and up to £10,000 for lower income households, covering the full cost of installations. The CEEB welcomes the announcement in the 10 Point Plan to extend the grant for an extra year, supported by additional funding. Near-term mandating of zero carbon measures for publicly owned buildings and large social housing providers would greatly incentivise scale up in supply chains, reducing costs to the wider market.

A programme of structural incentives is needed to stimulate the able to pay market and leverage private finance, backed by a reliable regulatory framework to drive buildings' carbon and energy performance. The CEEB convened a meeting of expert stakeholders in summer 2020, who made a series of suggestions that would help support this, outlined below.⁵⁷

- **Zero carbon heating technology rebate system:** Similar to the US 'Cash for Clunkers' scheme, property owners are incentivised to upgrade inefficient or fossil fuel technologies to efficient and zero carbon ones through a government grant or voucher scheme. The proposed Clean Heat Grant from 2022 could be

⁵⁷ <https://www.greenfinanceinstitute.co.uk/wp-content/uploads/2020/06/Stimulus-actions-for-a-greener-and-more-resilient-property-sector-.pdf>

brought forward to this year and offered alongside, Renewable Heat Incentive support. While providing immediate stimulus to eligible technologies and associated supply chain, the scheme also increases household disposable income.

- **VAT reform to stimulate energy efficient and zero carbon heating renovation:** At minimum, reintroduce the reduced rate of VAT payable on Energy Saving Materials (ESMs) to the previous level of 5%, rather than the standard rate of 20%. For higher impact and wider construction sector stimulus, introduce 0% VAT on all renovation activity, conditional on the inclusion of energy efficiency measures. Tax reductions can also be introduced on low carbon heating system costs and installations.
- **Landlord and business energy saving allowance:** Reintroduce the Landlords Energy Saving Allowance (LESA) that allows the cost of acquiring and installing certain energy-saving items to be deducted when calculating taxable profits, made to Landlords who exceed Minimum Energy Efficiency Standard (MEES) requirements. The allowance could be extended to SMEs by reinstating the Enhanced Capital Allowances scheme for energy and water-efficient equipment, and targeted communications could improve uptake
- **Domestic green home retrofit salary sacrifice scheme:** Comparable to the 'Ride to Work' scheme, employees draw a loan through their employer to invest into home energy and heat improvements and repay the financing via gross salary contributions.
- **Property assessed clean energy (PACE) financing:** Financial institutions provide long-term capital for retrofit projects, while local authorities or associated independent third parties collect repayments via an additional property charge that is passed through to the lender. Proven models in Australia, Spain and US.
- With the **Stamp Duty holiday** launched at summer's Economic Statement due to end in March next year, the upcoming Budget is the right time to introduce a **Stamp Duty rebate** for the purchase of energy efficient homes and zero carbon heating systems. With time, the rebate can evolve into a revenue-neutral mechanism to embed energy and carbon performance in property values, thereby establishing a powerful price signal to homebuyers and lenders that will complement other fiscal and regulatory mechanisms to support retrofit.
- **Green Help-to-Buy scheme:** The current HTB scheme could be extended beyond new-build housing and repurposed to preferentially support first-time buyers to purchase an energy-efficient and resilient zero carbon home, through minimum EPC criteria or government guarantees to support energy and heat improvements once the property has been purchased.
- **Carbon pricing:** As previously mentioned, a carefully crafted, sector-specific carbon price could help level the playing field between electrification and fossil gas. It will be essential to put in place provisions to support lower income families.

7. What action is required to ensure that households are engaged, informed, supported and protected during the transition to low carbon heat, including measures to minimise disruption in homes and to maintain consumer choice?

As noted in response to Question 2, enhancing awareness and engagement on zero carbon heating solutions along the value chain – including but not limited to end-consumers – will be essential to accelerate uptake. There is a role for Building Renovation Passports in informing and engaging consumers about the steps they need to take to get their house on track for zero carbon – including appropriate heating solutions – with links to the supply chain and funding options and opportunities. The MCS and TrustMark platforms could also be used to engage consumers about zero carbon heating solutions available, while financial institutions can play a valuable role in disseminating information through engaging the 97% of UK adults that are 'banked'.

All advice and engagement on low carbon heat must follow a fabric-first approach, which involves maximising the performance of the components and materials that make up the building fabric itself, before considering the use of mechanical or electrical building services systems. By maximising the energy efficiency of a home, less energy will be required to heat it, therefore lowering the costs of zero carbon heating solutions, and transition costs for customers.

Robust governance standards should underpin heat decarbonisation measures, with monitoring of performance in place to ensure delivery of value to customers. Government recognised accreditation bodies such as TrustMark and MCS can play a role in this. Please see question 2 for more information on Building Renovation Passports, which could complement this approach. A new consumer protection regime is required that assures the quality of the product, standards of service during and after installation, and that the price is fair. This may involve regulatory changes, such as extending the remit of Ofgem to cover all the heat market. Approaches that

support zoning will also require effective, localised communication with and between people benefitting from the new measures.

While advice and support should be available to all households, there is a particular need for the Government and Local Authorities to support lower income families and those in fuel poverty. The heat transition strategy should also be a plan to end fuel poverty, ensuring no one is left without access to a warm, healthy and zero carbon home.

There is debate and discussion regarding the levels of disruption associated with different technologies. Clarity around this will support the economics and help lower costs associated with heat decarbonisation. For example, health and safety risks have been identified around the introduction of hydrogen into homes. The risks associated with the storage of hydrogen (under high pressure or cryogenically in liquid form) and its use in Fuel Cell applications, are well appreciated by HSE and a comprehensive Guidance Note (HSG 243) has already been issued on the subject. In addition, work is already underway on various aspects of the fire and explosion hazards at the Health and Safety Laboratory, including investigations into the perceived risk of spontaneous combustion.⁵⁸ These risks – as well as perceptions associated with different low carbon heating technologies – need to be considered to ensure that households are supported and protected during the transition to low carbon heat.

8. Where should responsibility lie for the governance, coordination and delivery of low carbon heating? What will these organisations need in order to deliver such responsibilities?

While certain policy decisions are necessary at a national level, the resulting framework must empower and mobilise action at a local level. More details on specific local and national policy aspects are considered in question 2. A central National Delivery Body coupled with Zoning (identifying solutions for areas) would be important. Mandating local authorities to develop regional strategies would factor into this. The National Delivery Body could then provide technical assistance to local authorities on implementation, with implementation ultimately sitting with regional bodies. A common barrier is lack of capacity and expertise for local authorities – a National Body overcomes this issue, while also ensuring a common nationwide approach that guarantees solutions are uniform across the country, making the scaling up of private investment easier.

November 2020

⁵⁸ <https://www.hse.gov.uk/horizons/current-issues/energy-topics/hydrogen.htm>