EXECUTIVE SUMMARY

The UK Government has set a legally binding target to achieve net zero by 2050. As the heating sector contributes almost a third of the UK's carbon emissions[6,7], to reduce this significantly, the Government has set an ambition to install 600,000 heat pumps per year by 2028, and to phase out the sale of most new fossil fuel boilers from 2035 with exemptions for unsuitable homes, which it estimates to be around 20%. However, in 2023, the size of the heat pump market is expected to be around 60,000-unit sales, 10% of the 2028 target figure. A 10-fold acceleration in deployment is needed in the next five years if the 600,000 ambition is to be met, and the key success factor in doing so will be the policy framework.

This report summarises the Heat Pump Association's views on why heat pumps remain a core option for the impending revolution in how buildings are heated. It uses evidence, research, and analysis to demonstrate that heat pumps remain the most cost-effective heating option for the UK to reach net zero. It tracks recent progress and the performance of key policies and sets out the Heat Pump Association's views and recommendations on what is still to be done.

WHY HEAT PUMPS?

To meet the legally binding target of net zero by 2050, over 30 million homes and businesses across the UK will need to decarbonise in just over 25 years.[8] As a low carbon solution, heat pumps can be more than three times more efficient than fossil fuel boilers[9] and switching to heat pumps in the UK can reduce heating emissions by up to 75%, equivalent to all the territorial emissions of Denmark in 2021[10]. Our analysis of the Marginal Abatement cost of heat pumps, shown in the section of this report on Heat Pump Capabilities, has evidenced that they are the cheapest most scalable solution to decarbonising heat in buildings in the UK. However, this is also time-dependent, the longer we take, the faster the acceleration necessary, and the deeper, more costly, and more severe policy interventions will be needed to install the heat pumps required to decarbonise UK buildings in time to meet net zero.

6 DESNZ (2022) Energy Security Bill Factsheet
7 15% of this figure comes from homes, with less than 5% currently heated by low carbon sources.
8 HM Government (2023) Heat Pump Investment Roadmap
9 Energy Systems Catapult, Electrification of Heat UK demonstration project, Accessed 2023
10 Ritchie, Hannah & Roser, Max (2020) CO^2 emissions

WHERE ARE WE COMPARED TO WHAT IS NEEDED?

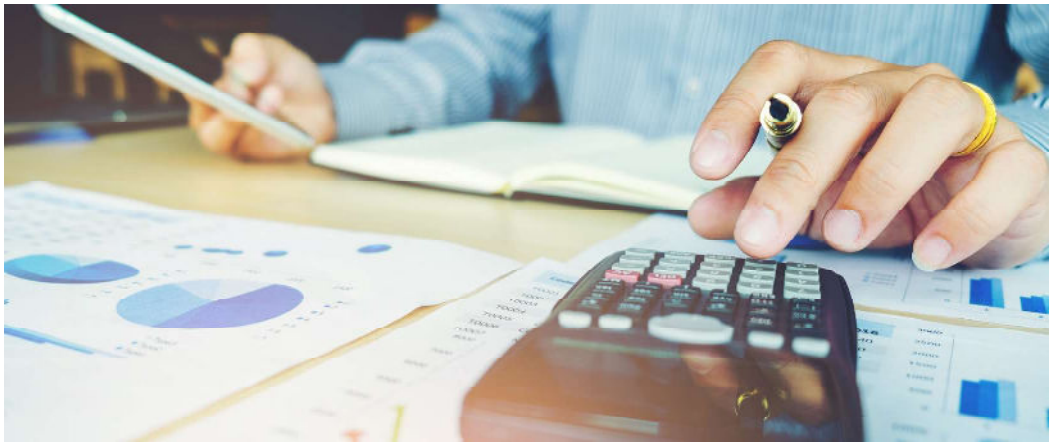
Compared to the rest of the heat pump market in Europe where countries such as Belgium, the Czech Republic, Slovakia, and Poland, doubled in growth in 2022[11], the UK has remained in the category of dormant markets. According to the Climate Change Committee (CCC), the UK is not currently on track to hit its 600,000 annual installations ambition by 2028, and heat pump installations across the UK must rise ten-fold in six years to reach stated Government ambitions.[12] There has been a range of proposed policies to support the deployment of heat pumps. However, much more needs to be done to meet the target.

BARRIERS TO GROWTH AND HOW TO REMOVE THEM.

This report identifies the key barriers preventing the significant growth in heat pump installations in the UK and offers policy solutions to help achieve the Government's ambition. In turn, achieving this will build the industry's capability to achieve the final phase-out of new fossil fuel boilers.

1. REDUCING UPFRONT COSTS.

The UK Government has rolled out a package of policies to support the upfront cost of heat pumps. This report provides an overview of these policies and a discussion with supporting analysis. Despite these policies, upfront cost remains a barrier for both the domestic and the non-domestic sector. Due to the unfamiliarity of heat pumps in the UK, one of the most significant barriers for consumers in 2020 had been a lack of awareness. Consumer awareness remains low with only 18% of people having a fair amount or a lot of knowledge of an Air Source Heat Pump (ASHP) and 17% for a Ground Source Heat Pump (GSHP), according to the latest government Public Attitudes Tracker from Spring 202313. Analysis shows that cost and convenience are key factors in unlocking demand.[14]



11 EHPA (2023) European Heat Pump Market Statistics Report 2023 Executive Summary
12 CCC (2023) 2023 Progress Report to Parliament
13 DESNZ (2023) DESNZ Public Attitudes Tracker: Summer 2023 - GOV.UK (www.gov.uk)
14 BIT (2022) How much are we willing to pay for a heat pump

RECOMMENDATIONS TO REDUCE UPFRONT COSTS:

1.1 Optimise the Boiler Upgrade Scheme by:

- Improving the promotion of available help to consumers
- Considering how support for groundworks associated with the installation of GSHPs can be optimised
- Providing a rural uplift, akin to Scotland[15]
- Committing to budgets for the scheme during 2025-2028
- Removing the 45kWth limit for shared ground loop systems
- Differentiated grant levels depending on owner and property type to stimulate growth where needed.

1.2 Clarify and extend the zero rate VAT relief for all heat pump systems by extending it beyond 2027, clarifying its applicability to all installations of heat pumps and work needed to optimise their efficiency, and allow it to apply to situations where, particularly for Ground Source Heat Pumps, more than one party is contracted by the customer. In addition, consideration should be given to apply zero rate VAT relief to items which support future heat pump installations, such as heat pump ready cylinders.

1.3 Introduce Government-backed interest-free loans in England, Wales, and Northern Ireland to cover the remaining cost of installing a heat pump and other energy saving measures, akin to the scheme in Scotland.

15 Home Energy Scotland Grants and Funding for Heat Pumps · Home Energy Scotland

2. REDUCING RUNNING COSTS.

The running cost of heat pumps, due to the cost of electricity, does not necessarily incentivise consumers to switch from fossil fuel boilers. There is currently no sufficient policy support to help reduce the running cost of heat pumps and this remains a significant gap which requires a regulatory intervention.

At current electricity and gas prices, the usable heat delivered into a domestic property by a heat pump across a year needs to be over 3.2 times[16] the amount of electricity consumed (known as the Seasonal Coefficient of Performance, or SCOP) for a typical consumer to enjoy lower running costs than a gas boiler. A distortion in the relative retail gas and electricity prices is partly responsible for high electricity prices because 18% of a typical electricity bill pays for Environmental and Social Obligations (ESOs), whereas this is only 5% for typical gas bills. Additionally, there is a hefty carbon tax embedded within electricity wholesale prices that does not apply to gas. Driving up the performance of heat pumps will also be an important factor in reducing running costs.

16 Part L of the Building Regulations requires a minimum of 2.8 for space heating, and 2.0 for hot water.

RECOMMENDATIONS TO REDUCE RUNNING COSTS:

2.1 Re-balance policy costs - Our analysis has shown that if policy costs were equal per unit of energy used on gas and electricity bills, fuel costs from heating a home using an air source heat pump with a seasonal performance factor[17] (SPF) of 2.8[18] would be £95 lower than compared to a gas boiler operating at 84% efficiency, and £264 lower with a ground source heat pump, assuming a SPF of 3.34[19]. We recommend Government therefore expedites work already under way to rebalance these policy costs with the aim of making electricity bills cheaper and speeding up electrification for households and businesses.

2.2 Introduce an interim heat pump electricity tariff to further support a reduction in electricity prices relative to decarbonising heat and encourage consumers to cut their emissions from heating and switch to a heat pump.

2.3 Introduce Mandatory Routine Practices for Heating System Installations and Servicing of both boilers and heat pumps, aimed at reducing operating temperatures and ensuring systems are otherwise properly maintained.

2.4 Develop and introduce appropriate policy to support investment in large scale, long-duration electricity storage solutions in line with the commitments set out in the British Energy Security Strategy.[20] We encourage government and grid operators to increase investment in energy storage to allow a smooth transition to low carbon technologies and to prevent curtailment costs from being passed onto electricity users.

17 Seasonal performance factor: Defined as the ratio of heat output over the heating season to electricity input and therefore accounts for seasonal variations in performance.

18 ESC (2023) Electrification of Heat UK demonstration project

19 Assuming a ratio of air-to-water heat pump efficiency to ground-to-water heat pump efficiency according to average ratio from the following trials: Energy Saving Trust 1, Energy Saving Trust 2, Renewable Heat Premium Payment

20 https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy#networks-storage-and-flexibility

3. GROWING THE INSTALLER WORKFORCE.

To install 600,000 heat pumps per year by 2028, it is equally necessary to have enough qualified and competent heat pump installers. The HPA's analysis suggests that a minimum of 50,200 installers (FTE) will be required by 2030 to meet the demand necessary.[21] This is of concern as, according to Government figures, there are currently approximately 4,500 qualified and competent individuals working for MCS certified businesses.[22] Preparing this heat pump installer workforce is challenging for several reasons: uncertainty of the long-term need for the qualification,[23] certification costs, course costs and lost income from attending courses[24] as well as the effort required to organise attendance, studying time and travel all play a part. The industry has already made a strong start by obtaining Ofqual approval for Level 3 courses for heat pump installers, and by developing the Low Carbon Heating Technician Apprenticeship, for which up to £22,000 of funding per apprentice has now been confirmed.

21 HPA (2020) Building the Installer Base for Net Zero Heating
22 DESNZ (2023) Clean Heat Market Mechanism
23 Nesta (2022) Helping mid-career gas boiler engineers to retrain in heat pumps
24 Nesta (2022) Helping mid-career gas boiler engineers to retrain in heat pumps

RECOMMENDATIONS TO GROW THE INSTALLER WORKFORCE:

3.1 Closely monitor the Heat Training Grant. Immediate action must be taken if there is a less than anticipated uptake of the scheme or signs that the grant needs to be increased.

3.2 Low Temperature Heating Training as mandatory. Standards across the whole of the heating industry should move to low temperature heating. This could be achieved through the introduction of a low temperature training pre-requisite prior to the completion of a five-yearly ACS renewal for those installing wet heating systems, and equivalent for oil boiler engineers. This requirement should be incorporated into the soon to be published updated Minimum Technical Competencies (MTCs)[25] that installers will need to meet if they wish to self-certify their heating installations in compliance with the Building Regulations.

3.3 New support for the future/current installer workforce. The HPA would urge England, Wales, and Northern Ireland to introduce similar support for current or potential future installers such as the MCS certification fund or the Green Heat Installer Engagement programme, currently available in Scotland[26].

25 Minimum Technical Competencies will be renamed Mandatory Technical Competencies when updates are published.
26 Support for green heat installers - Energy Saving Trust

4. ENCOURAGING NEW ENTRANTS INTO THE INSTALLER WORKFORCE.

While there is a need to reskill the current workforce, industry faces another challenge of the ageing demographic of the heating installer base and low rates of new entrants. To avoid a gap in the required number of heating installers by 2030, a 78% increase in the take-up of heating apprenticeships is required. The announcement of a funding band of £22,000 per apprentice for the Low Carbon Heating Technician Apprenticeship is welcome and it should continue to be promoted, with consideration given to enhancing and monitoring the diversity of those undertaking the apprenticeship. One of the biggest challenges facing the industry is that uncertainty is created in the market due to a lack of commitment to clear policy frameworks and timelines, causing installers to view the heat pump market as a risk to enter. Individuals need to have the confidence to spend time and money on retraining and this uncertainty makes investment to train a bigger risk. Although often simpler to retrain an existing heating engineer to install heat pumps, with an ageing demographic it will be vital to encourage new entrants into the sector.

RECOMMENDATION TO ENCOURAGE NEW ENTRANTS INTO THE INSTALLER WORKFORCE:

4.1 The Low Carbon Heating Technician Apprenticeship should continue to be promoted, with consideration given to enhancing and monitoring the diversity of those undertaking the apprenticeship.

5. INCREASING EASE OF HEAT PUMP INSTALLS AND IMPROVING CONSUMER AND INSTALLER CONFIDENCE.

Although a globally mature technology, compared to traditional boilers, heat pumps remain less familiar to consumers and installers. There are currently administrative processes which are either unclear or lengthy which delay the installation of heat pumps. It is necessary to obtain planning consent to install an air source heat pump where the scope falls outside of the Permitted Development Rights (PDR) legislation. Requirements for permitted development and planning consent currently vary between devolved nations, with different requirements around the approved size of the ASHP unit, proximity to neighbouring properties, and the approach to regulating noise limits, making it unclear for installers and consumers.

It is also currently required to register the asset with the Distribution Network Operator (DNO) via the "Connect and Notify" process, or to seek prior approval via the "Apply to Connect" process [27 OBJ]. The ENA is working on a new process due to be launched in Winter 2023, which will require prior notification for every heat pump connection. It is intended that the new "Digitalisation of Connections" (DOC) app will replace the existing "Connect and Notify" process and will require all heat pump installations to apply for a connection via an app and wait for the DNO to approve before they are installed. This could add additional complexity and delays for installers in securing new projects.

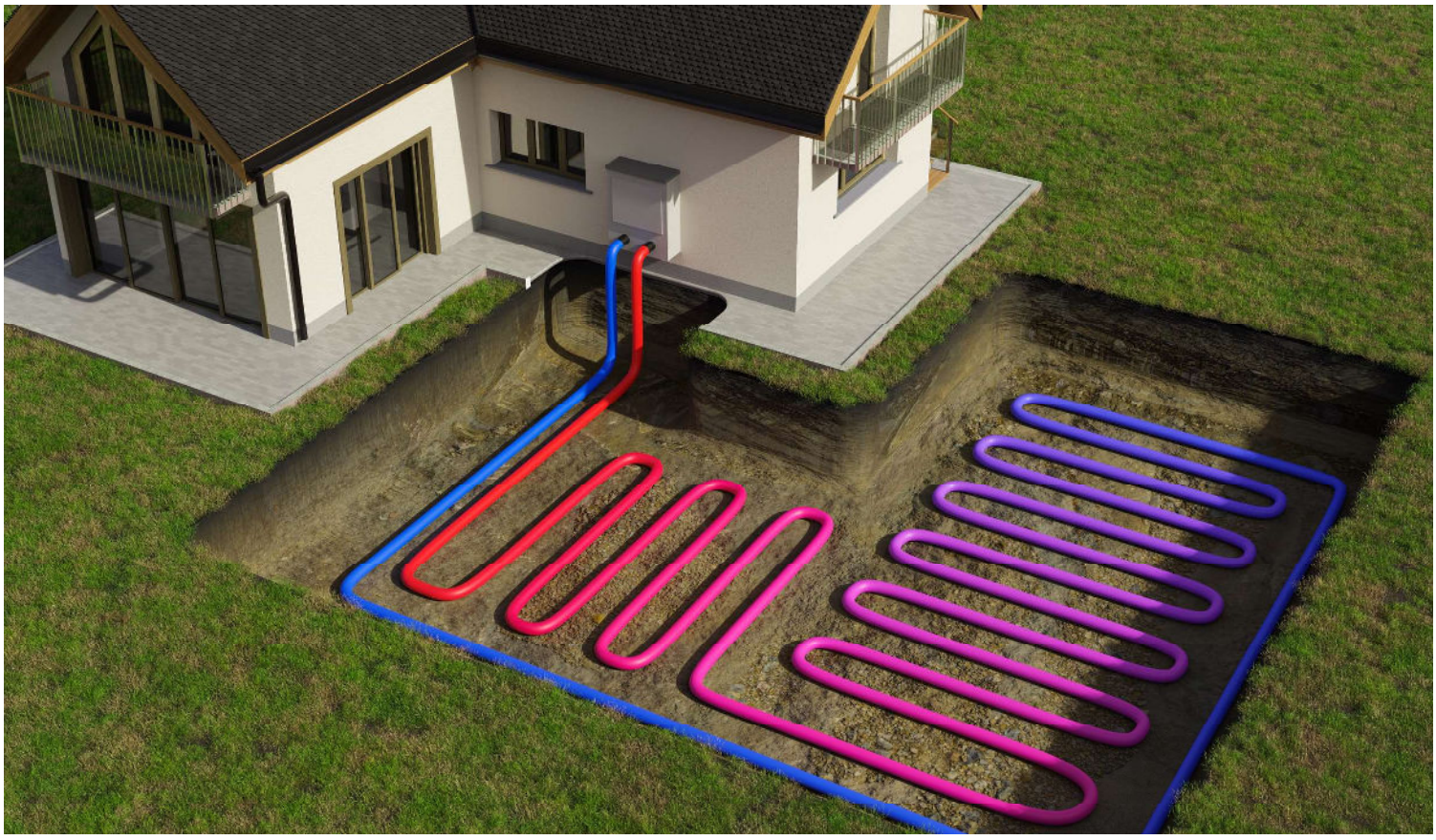
Consumers need clear information about the benefits of installing a heat pump28. Currently, RdSAP, the algorithm that underpins Energy Performance Certificates (EPCs) in existing homes undervalues the high energy efficiency and low carbon nature of a heat pump, giving consumers an inaccurate representation of the benefits of switching. RdSAP 2012 is the current version and is considerably out of date. It uses decade-old carbon emission factors for electricity which unfairly score heat pumps' carbon savings because they do not reflect the true extent of electricity grid decarbonisation over the last 10 plus years. The Government is in the process of reviewing this and intends to publish an updated RdSAP- RdSAP 10.2, in Spring 2024 to reflect the changes to the Buildings Regulations Part L which came into effect

27 ENA (2021) Connecting Electric Vehicles and Heat Pumps to the Networks
28 Nesta (2023) Heat Pumps: A User Survey

in June 2022. Further changes to the SAP/RdSAP methodology and Energy Performance Certificate (EPC) design are expected with the Future Homes Standard currently planned to be introduced in 2025.

Additionally, consideration of redesigning the EPC to better promote the merits of installing low carbon heating systems which may improve and enhance the overall deployment of heat pumps within the UK would be welcomed. Possible considerations include:

- The addition of metrics that display the benefits of low carbon technologies more prominently to householders to aid their understanding of the positive environmental impact of heat pumps
- Reconsidering how the cost rating is displayed to ensure that consumer confusion is avoided
- Adding a description of whether a home is 'heat pump ready'.



RECOMMENDATIONS TO INCREASE THE EASE OF HEAT PUMP INSTALLS AND IMPROVE CONSUMER AND INSTALLER CONFIDENCE:

5.1 RdSAP 10.2 should be implemented without further delay to ensure heat pumps' contributions to EPC ratings properly reflect carbon savings.

5.2 Permitted Development Rights (PDR) for ASHPs must be urgently reviewed to ensure that the requirements across the devolved nations in relation to noise levels, size of the unit and proximity to the property boundary are proportionate, consistent, and clear for installers and consumers, and are based on the latest evidence.

5.3 Streamlining and simplifying grid connections. The process for heat pumps to seek grid connection must be streamlined and simplified which would be supported by enhanced investment into the grid.

5.4 Ensure SAP 11 is ready before the legislation to implement the Future Homes Standard takes effect.

5.5 Consider an EPC redesign to better promote the merits of installing low carbon heating systems.

6. HEAT NETWORKS AND HEAT PUMP NETWORKS.

Heat networks are recognised by the Government as a crucial, low-cost, low carbon solution for offering heat in high density urban areas.[29] To support the upfront cost of improving or building heating networks, the UK Government has rolled out several schemes across the UK such as the Heat Network Investment Programme (HNIP), the Green Heat Network Fund (GHNF) and the Heat Network Efficiency Scheme. Additionally, the government is introducing a comprehensive heat network zoning policy that will underpin the rapid deployment of low carbon heat networks across the UK. The HPA welcomes these policies as significant steps towards decarbonising the UK building stock and improving energy efficiency which plays a large role in achieving the UK's net zero target. In addition to this traditional form of a heat network, ambient heat networks which include heat pumps, are likely to play a growing role in heat decarbonisation.

Ensuring the right market conditions develop for networked heat pumps within the private retrofit market will depend on the industry's ability to reduce costs and introduce new financing models. However, in common with traditional heat networks, heat pump network developers require a degree of certainty of connection from homes to support the investment case for the installation of infrastructure. Local Area Energy Plans will play a key role in building heat network zoning and identifying the most appropriate heating technologies for different areas of towns and cities and in incentivising/encouraging their uptake to ensure the successful delivery of the plan. Some local authorities in England and Wales are developing Local Area Energy Plans voluntarily, whilst the Scottish Government has already made the development of these plans' compulsory for all local authorities.

29 DESNZ (2016) Heat Networks

RECOMMENDATIONS ON SUPPORTING THE DEVELOPMENT OF HEAT NETWORKS AND HEAT PUMP NETWORKS:

6.1 Continued and expanded funding for heat network decarbonisation. The HPA supports the progress so far on the capital schemes to encourage heat networks to adopt heat pumps and believes these schemes need to continue for the foreseeable future.

6.2 Reform of the Social Housing Decarbonisation Fund to deliver clean heat projects. Wave 3 of the SHDF should provide a ring-fenced or priority funding pot for clean heat projects to ensure a minimum number of installations go ahead. Additionally, reflecting the known flaws in the EPC assessments, EPC eligibility criteria for those properties seeking to replace old direct electric heating should be relaxed to Band C.

6.3 Reform of ECO4 to ensure delivery of clean heat projects in social housing. The requirement for social housing providers to be at Band E or below before qualifying for ECO4 excludes virtually all potential heat pump network projects in social housing from receiving funding. Eligibility criteria for ECO EPCs should be relaxed to Band C projects at least for projects which currently have direct electric heating.

6.4 More research into policy to support funding arrangements for Ground Source Heat Pump infrastructure. The HPA would like to see the Government undertake more research into maximising the opportunities and addressing any regulatory barriers, to new, utility-style funding options for shared ground source infrastructure.

6.5 Local Area Energy Plans. Development of Local Area Energy Plans, centrally coordinated by the Future Systems Operator to support, alongside other aims, the deployment of heat pump networks on an area-wide basis.

6.6 Licensing for the installations of shared ground loops. Regulations made under the provisions of the Energy Act 2023[30] must allow for developers of heat pump networks to obtain licenses to install and maintain shared ground loops, without the need for obtaining planning permission.

30 https://bills.parliament.uk/bills/3311

7. IMPROVING MARKET DRIVERS.

Wider regulatory support is crucial to heat pump deployment. Three key proposed regulatory measures are the Clean Heat Market Mechanism due to launch in 2024, the Future Homes and Building Standard in 2025 and the phase out of the sale of most new fossil fuel boilers from 2035 with exemptions for 'unsuitable homes', which is estimated to be around 20%. This report provides recommendations for each of these essential regulatory measures so that they best support heat pump deployment.

The principles of the Clean Heat Market Mechanism (CHMM) and the timeframe set out for its introduction are likely to have a negative impact on the wider roll-out of heat pumps if the scheme goes ahead as proposed in the Summer 2023 Consultation. We are aware that the Government is further considering the design of the policy in response to the consultation. We await with interest the final policy proposals, to be set out in due course in the publication of the Government response to the consultation.

The UK Government has proposed an ambition to phase out the sale of most new fossil fuel boilers from 2035 with exemptions for unsuitable homes, which it estimates to be around 20%. The absence of firm decisions on this date, and the lack of clarity over what criteria will result in an exemption is creating uncertainty for investors and other parts of the supply chain.

The new build sector is critical to enhancing the market. Not only are newly built homes trailblazers for the retrofit market, but the Government's stated objective that all homes built after 2025 should be zero carbon ready is an essential next step in meeting net zero. Delays to the planned timetable of Spring 2023 for technical consultations for the Future Homes and Buildings Standard are causing concern in the supply chain, stifling demand, and creating investor uncertainty.

In addition to these key regulatory measures, consideration should be given to providing preferential Council Tax[31] and/or Stamp Duty[32] rates to those homes that already have a heat pump installed to boost consumer acceptance and demand.

31 https://www.energysavingtrust.org.uk/sites/default/files/Paper%20for%20Commission%20on%20Local%20Tax%20Reform_11August15.pdf
32 https://www.theeeig.co.uk/stamp-duty/

RECOMMENDATIONS TO IMPROVE MARKET DRIVERS:

7.1 Introduce the other market enablers recommended in this report in advance of a more balanced and workable Clean Heat Market Mechanism to allow it to work effectively.

7.2 Confirm and legislate for the dates to end new sales of fossil fuel boilers – both on and off the gas grid and swiftly define the exemption criteria for unsuitable homes.

7.3 Expedite the technical consultations for the Future Homes / Buildings Standard to allow implementation as planned in 2025.

7.4 Provide preferential Council Tax and/or Stamp Duty rates to those homes that have a heat pump installed to boost consumer acceptance and demand.

8. INVESTMENT IN INNOVATION.

The Government has provided several innovation grants to encourage innovative models for heat pump deployment and encourage investment in UK manufacturing. These have been welcomed by the industry.

It is important for product innovation to be encouraged and for performance requirements to be steadily improved over time and for testing to be done on a consistent and reliable basis, such as the methods already in place through Heat Pump Keymark[33].

Heat pumps will also, in future, become an increasingly important part of a flexible grid, and consumers may be able to benefit from revenue streams emerging from electricity suppliers' or grid operators' desire to move the timing of demand. The technical capability for flexible control is therefore set to become increasingly important.

33 Heat Pump KEYMARK

RECOMMENDATIONS FOR INVESTMENT IN INNOVATION:

8.1 The UK Government should not relax the current strict testing criteria already in place via Heat Pump Keymark or equivalent schemes. In addition, heat pumps should also continue to be tested to the current ErP requirement of SCOP 3.0 (average climate, 55°C flow).

8.2 Introduce the Smart Heat Pumps Mandate as soon as practicable, providing sufficient time is allowed to prepare (minimum 2 years notice).

The HPA supports formalising the requirement for heat pumps to operate flexibly to allow access to additional consumer benefits from lower running costs or additional revenue streams in response to changing electricity prices or network conditions. However, standards, guidelines, governance arrangements and interoperability requirements need to be in place and stable sufficiently in advance.

8.3 Increase funding to support Heat Pump Supply Chain Investment. The HPA would strongly urge more investment in the development of UK based manufacturing facilities via additional funding of the Heat Pump Investment Accelerator Competition. The HPA are calling for more innovation funding via the Heat Pump Ready Programme to support the development of new mass-market solutions for high-density heat pump deployment, tools that simplify and speed-up installation processes, learning aids to support installers, and mechanisms that support knowledge transfer between innovative parties.