



Department for  
Business, Energy  
& Industrial Strategy

# Heat Pump Ready Programme

Engagement events and one-to-one sessions  
Q&A responses

November 2021



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## Purpose of this document

This document is a follow up to the Heat Pump Ready engagement events held week commencing the 1<sup>st</sup> November 2021. Within this document is the questions asked during the event, via email post-event and during the one-to-one sessions held with the BEIS team. Similar questions which result in the same response have been grouped where possible.

Please note, the responses to the questions, within this document, are correct at the time of publication and are subject to change in final competition guidance and invitation to tenders. Responses will not be updated within this document if changes occur to the programme.

Responses in this document may differ from those published in later Heat Pump Ready documentation. Please be advised, that responses in this document may be superseded by any later materials. Details within the final published competition guidance/invitation to tender take precedence over any responses within this document where there are conflicting responses.

It is the responsibility of the applicant / supplier to ensure they are reviewing the most recent programme documentation.

# Section 1: Policy

## Net Zero Targets

1.1. Is 600,000 installations a year from 2028 onwards consistent with meeting the UK's NDC and the 6th carbon budget? A back of the envelope calculation suggests that, on this basis, by 2035 we would have ~6 million heat pumps installed.

1.2. Is the modelling that demonstrates 600,000 installations per year by 2028 is compliant with the UK's NDC of a 68% reduction by 2030 and the 6th Carbon Budget target of 78% by 2035 (all relative to 1990 levels) published and in the public domain?

*The policies we have announced will allow the market to grow to 600,000 heat pump installations a year by 2028, which is compatible with our aims and objectives for the Sixth Carbon Budget. Our pathway analysis published in the Net Zero Strategy assumes deployment of 6.9 to 11.3 million heat pumps by 2035.*

1.3. Does national mean the 4 nations or UK as a whole?

*Our ambition to grow the market to 600,000 heat pump installations a year by 2028 covers the whole UK.*

## Heat Pump Policy Ambition

1.4. Does the move to heat pumps align with the 2030 fuel poverty target?

*We want the transition to low-carbon heating to be fair and affordable to all. The support we are making available to aid the deployment of heat pumps will help both those able and least able to pay. We are also taking steps to ensure consumers who may be in fuel poverty or vulnerable to falling into fuel poverty are protected. For example, in the Social Housing Decarbonisation Fund any new heating system installed must reduce bills when compared to the existing heating system it is replacing when considered in isolation (i.e. ignoring the impact of any other measures (e.g. fabric measures) installed).*

1.5. How much are we learning from experience in Sweden, etc. where heat pump role out has been successful? They must have looked at lots of these issues as well.

*Policy draws on best practice from around the world to ensure we are taking lessons learnt from countries where heat pumps have been successfully deployed in volume.*

1.6. Any thoughts about bringing more expertise to local authorities? Heat is a very local issue (unlike say generation).

*Local Authorities have a key role to play in the transition to low-carbon heating. Through our Local Area Energy Planning and Mapping work with Ofgem, we are seeking to develop greater local coordination of the transition to low-carbon heating.*

## Boiler Upgrade Scheme

1.7. Why have the government allocated funding for the Boiler Upgrade Scheme for 30,000 heat pumps p.a. for the next 3 years which is: a) less than the 35,000 units that are currently installed under RHI and b) considerably less than the 600,000-p.a. target...?

1.8. Norway has seen a 45x greater deployment rate than the UK (46 per 100,000 households vs <1 in the UK) using a range of measures and incentives. Does BEIS envisage other measures for domestic deployment other than just the £5/6k grant?

*The Boiler Upgrade Scheme is just one of a number of Government policies designed to aid the growth in the heat pump market. Collectively, our policies will help enable the market to grow to 600,000 installations a year by 2028.*

1.9. There appears to be funding for grants to support around 90,000 heat pumps over the next 3 years. Will this be in annual tranches? I ask because consumers may tend to wait for the next tranche rather than go ahead without the grant, which seems likely to limit installations rather than help reach the ambition of 600,000 per year.

*In order to manage the budget and prevent any programme overspend, there will be caps on annual voucher allocations under the Boiler Upgrade Scheme. We will ensure data on voucher availability is made publicly available and Ofgem, as the scheme administrator, will implement a queueing system, if necessary, if the budget cap for the financial year is reached.*

1.10. Many properties are more suited to high temp HP's and avoid high level of retrofit, but are more expensive, is the grant the same as for low temp?

*The grant available to heat pumps under the Boiler Upgrade Scheme does not discriminate between low temperature and high temperature models.*

## Other Heat Pump Policies

1.11. It has been mentioned that the Social Housing Decarbonisation Fund is accessible for heat pump installations. Could you clarify this as the fund has been inaccessible for heat pumps so far.

*Low carbon heating, such as heat pumps, is deemed an eligible technology under the Social Housing Decarbonisation Fund and can be installed through the scheme where a fabric first approach is taken, and the new heating system reduces bills when compared to the existing heating system in isolation.*

1.12. SHDF does not allow for GSHP uptake unless fabric upgrades are being applied for. This means if a property has already had fabric improvements, but still has inefficient heating systems that can be decarbonised, they cannot be installed under SHDF. If the guidance on SHDF can be changed for the next wave this could increase uptake of GSHP including higher density installations across the country.

*Thank you for your feedback, we welcome suggestions on how the Social Housing Decarbonisation Fund can be improved to deliver its overall objective to improve the energy performance of social housing.*

1.13. Could you repeat which two sources of funding are specifically directed towards GSHPs? I heard one being GHNF; the other was...?

*Support for Ground-Source Heat Pumps is available through a number of different schemes, including the Boiler Upgrade Scheme, Green Heat Network Fund and Social Housing Decarbonisation Fund.*

1.14. Both GHNF and SHDF are competitions that don't provide the same market benefits as a voucher scheme or RHI style fund. What impact do you think this will have on improving supply chains?

*We believe a variety of policies are needed to support deployment of low-carbon heating and collectively we anticipate that the combination of support available will allow the market to grow to 600,000 installations of heat pumps a year.*

1.15. How much consideration is being given to growing the market through mass deployment on new build estates?

*When it is implemented in 2025, the Future Homes Standard will ensure that new homes are zero carbon ready – producing at least 75 per cent lower CO<sub>2</sub> emissions compared to those built to current standards, and requiring no further retrofit to become fully zero carbon as the electricity grid continues to decarbonise. While building regulations*

*themselves do not mandate or ban the use of any specific technologies, Government intends to set the performance standard at a level which means that new homes will not be built with fossil fuel heating, but with low carbon technologies such as heat pumps, and will encompass very high fabric standards, and improved building services. We're not waiting until 2025 to take action; from 2022 we will be implementing an interim uplift to Part L of the building regulations- new homes will be expected to produce 31 per cent less CO<sub>2</sub> emissions compared to current standards, delivering high-quality homes that are future-proofed for the longer-term.*

1.16. LAD schemes focus upon the alleviation of fuel poverty. This is not a strategy for rapid reduction of CO<sub>2</sub> emissions. Is it intended that a heat pump roll-out would follow that same fuel poverty priority, or will it aim for the economies of a district-by-district roll-out?

*We want the transition to low-carbon heating to be fair and affordable to all. The support we are making available to aid the deployment of heat pumps through various policy mechanisms will help both those able and least able to pay. This approach will significantly increase demand for heat pumps, enabling the market to rapidly scale up and achieve economies of scale.*

1.17. We were fitting quite a few heat pumps in non-domestic properties, up until the end of March 2021, when the ndRHI scheme ended. We are now having to fit gas and oil boilers, due to this scheme ending. What policies are going to be put in place to reverse this?

*The government supported the installation of heat pumps in non-domestic buildings through the non-domestic Renewable Heat Incentive (ndRHI) from 2011 to 2021. Following closure of the ndRHI, the government is continuing to support and drive the transition to low carbon heat in commercial, industrial and public buildings.*

*For example, we have been supporting the installation of clean heat measures through the Public Sector Decarbonisation Scheme. Phases 1 and 2 of this scheme offered over £1 billion in grant funding to publicly owned buildings for heat decarbonisation and energy efficiency projects. Phase 3 will fund further projects from 2022/23 to 2024/25 and have a total budget of £1.425 billion. Furthermore, when it is launched in Spring 2022, the Boiler Upgrade Scheme will provide upfront capital grants to non-domestic buildings for installing heat pumps below 45kW. The scheme will have a budget of £450 million over 3 years.*

*In addition to government support, we are also consulting on phasing out new installations of fossil fuel boilers in non-domestic buildings off the gas grid. We are proposing that these regulations come into force from 2024 and will be designed to ensure a 'heat pump first' approach to the replacement of existing high carbon heating systems.*



1.18. What proportion of heat pumps should gas boiler sellers be offering in comparison to gas boilers [under the proposed Market Mechanism]?

*It is of course ultimately up to individual companies throughout the supply chain to decide on the product mix and corporate strategies that work best for them.*

*Under proposals in our consultation on a market-based mechanism for low-carbon heat, we are consulting on introducing a requirement for the manufacturers of fossil fuel appliances sold in the UK to meet a rising standard of low-carbon heat pump sales commensurate with a reasonable trajectory towards around 400,000 retrofit heat pumps per year by 2028, either directly and/or through obtaining credits from other heat pump manufacturers.*

*Relative proportions of fossil fuel and low-carbon products at a per-company level at any point in time will likely vary due to a range of factors and business decisions, including those unrelated to the market-based mechanism.*

## Heat Pump Costs

1.19. 80% of homes in the UK are not heat pump ready due to the U Value of homes and their poor insulation, many heat pumps have been fitted already in poorly insulated homes and they currently cost more to run than gas boilers. Who is going to pay for the insulation upgrades to buildings?

1.20. How is the necessary insulation and ventilation supported alongside the transition to heat pumps?

1.21. BEIS mentioned "significant investment" in improving the energy efficiency/insulation of the UK housing stock. The Heat & Buildings Strategy does not outline any funding targeting energy efficiency for able to pay consumers, so I was wondering if they could provide more detail on the investment they refer to?

*Our analysis indicates that around 80 to 90 per cent of homes currently have sufficient energy efficiency and internal electrical limits to accommodate a heat pump. However, due to the diversity of UK housing stock, it means that in some cases fabric energy efficiency upgrades, such as loft or wall insulation, may be required.*

*We were clear in the recent publication of our Heat and Building Strategy that the journey to Net Zero buildings starts with better energy performance, improving the energy efficiency of the fabric of our buildings and the products we use in a way that will save households and business money off bills and improve the comfort and value of homes. These fabric upgrades will lower the heating demand of the home and deliver benefits regardless of what heating appliance is selected.*

*In our Heat and Buildings Strategy, we committed a further £3.9 billion over the next three years to help improve the energy efficiency of buildings and support the transition to low-carbon heating. This will be delivered through schemes like the Home Upgrade Grant and Social Housing Decarbonisation Fund, and takes our total investment to date to almost £6.6 billion, under this Government.*

1.22. Calculations I've carried out on my own well-insulated and heat pump ready house indicate that the operating cost of a heat pump system would increase my energy costs by £400 per year compared to my gas-fired boiler system. No amount of installation grant will financially justify me investing in a heat pump installation until the government addresses the relative cost of gas and electricity to reflect carbon intensity.

*The government recognises the current pricing of electricity and gas does not incentivise consumers to make green choices, such as switching from gas boilers to electric heat pumps. We want to help reduce electricity costs so we will look at options to shift or rebalance energy levies or obligations (such as the Renewables Obligation, Feed-in-Tariffs or the Energy Company Obligation) away from electricity over this decade. This will include looking at options to expand carbon pricing and remove costs from electricity bills while seeking to limit the impacts on bills overall, especially for vulnerable consumers.*

*We know that in the long run, green products are more efficient and cheaper, and we are putting fairness and affordability at the heart of our approach. We will launch a Fairness and Affordability Call for Evidence on these options for energy levies and obligations to help rebalance electricity and gas prices and to support green choices, with a view to taking decisions in 2022.*

1.23. How do you see heat pumps meeting parity in running costs with gas boilers?

1.24. From the first presentation can any more information be provided on current proposals to change electricity and gas prices to make heat pumps more competitive to run, as running costs are likely to be a key barrier (including a barrier to green finance).

1.25. What actions are being taken to address the imbalance between gas and electricity taxation and costs? Therefore, make electrification of heat more attractive.

*To reach cost parity we believe it will be necessary to (1) improve fabric efficiency of the building stock, (2) drive improved product performance, (3) incentivise people to use heat pumps more flexibly, and (4) address price distortions in the market to reduce the cost of electricity relative to gas.*

*In particular, the government recognises the current pricing of electricity and gas does not incentivise consumers to make green choices, such as switching from gas boilers to electric heat pumps. We want to help reduce electricity costs so we will look at options to*

*shift or rebalance energy levies or obligations (such as the Renewables Obligation, Feed-in-Tariffs or the Energy Company Obligation) away from electricity over this decade. This will include looking at options to expand carbon pricing and remove costs from electricity bills while seeking to limit the impacts on bills overall, especially for vulnerable consumers.*

*We are putting fairness and affordability at the heart of our approach. We will launch a Fairness and Affordability Call for Evidence on these options for energy levies and obligations to help rebalance electricity and gas prices and to support green choices, with a view to taking decisions in 2022.*

1.26. Running costs depend upon more than the heat pump. Costs depend upon the heating system (radiators or underfloor heating and hot water storage). Is this to be part of policy inclusion?

1.27. What is being done to ensure new gas heating installations are being designed for low operating temperatures? This is necessary to ensure gas boiler installations are also 'heat pump ready'.

*We agree that much greater emphasis needs to be given to the design of the whole heating system, rather than the heat pump alone. We are taking action to ensure that system design is thoroughly considered by supporting new training. We are also proposing changes to building regulations that will ensure that any new or replacement heating system (where the entire system is being replaced) is designed to operate with a maximum flow temperature of 55°C. This will ensure that future heating distribution systems are designed to be heat pump ready.*

1.28. Why are multi dwelling homeowners not entitled to domestic subsidy. Surely it would be better to install one large heat pump into a block of flats than 50 individual ones.

1.29. Heat networks seem to be the way to go with GSHP. If a heat network is installed, people can connect to them when [they] feel ready to accept heat pump technology. The ground array can be financed by a standing charge which consumers are familiar with (gas and Electricity bills). Take a look at Kensa's Green Street projects. In this way you could drive down the cost of GSHP and the time to install?

*There are over 14,000 heat networks in the UK, providing heat and hot water to approximately 480,000 consumers. This includes a number of schemes using a single heat pump to provide communal heating and systems based on 'shared ground loops', where heat is taken from the ground through a single shared ground array and distributed to multiple users through individual heat pumps. Heat pumps connected to a heat network in this way are an attractive solution in many buildings and we are encouraged by the number of such schemes being taken forward by companies.*

*We aim for around a fifth of our heat to be supplied by heat networks by 2050. BEIS is supporting the development of heat networks in a number of ways. To date we have awarded over £250m to develop and build heat networks in England and Wales via our Heat Networks Investment Project. We will also be launching the Green Heat Network Fund next year to help new and existing heat networks adopt lower carbon technologies, such as heat pumps. In addition to this, we have recently consulted on our plan to introduce Heat Network Zoning. This will help drive deployment of heat networks by improving identification of areas where heat networks are particularly suitable, for example because there is a viable source of low carbon heat and appropriate heat demand near to each other. At the same time, we intend to introduce regulation for the heat network sector as soon as possible, ensuring customers have the same protections as gas and electricity customers.*

1.30. Is your primary goal for a pumped property carbon reduction or saving money? If carbon, are actual CO<sub>2</sub> emissions for bio-energy power plants and incinerators going to be included in grid intensity figures. Without that included were deluding ourselves with heat pump installation.

*Our policies are designed to strike a balance between delivering carbon emission savings while doing so at lowest possible cost to the consumer. Extensive government and independent analysis from heating engineers and energy professionals indicate that heat pumps are a cost-effective means of decarbonising heat in homes and businesses across the UK. As the grid decarbonises over the forthcoming years, we expect life cycle carbon emissions from heat pumps to rapidly fall. Therefore, we anticipate heat pumps will be the principle means of decarbonising heat in buildings over the next decade and potentially beyond. That is why we have set an ambition to install 600,000 heat pumps per year by 2028.*

1.31. Has any consideration already been made for the whole-life costs of heat pumps? Ground Source Heat Pumps have a life expectancy of at least 30 years, with a ground loop life expectancy of at least 100 years. This is massively better than the whole-life costs of Air Source Heat Pumps which are currently failing at between 10 & 15 years.

*We do take into account the lifetime costs of heat pumps and we expect ground source heat pumps to play an important role in the decarbonisation of heat. We have been supporting the development of ground source heat pumps through the Renewable Heat Incentive and they will also benefit from funding through the Boiler Upgrade Scheme. In addition, ground source heat pumps are also eligible for support through schemes like the Social Housing Decarbonisation Fund and Green Heat Network Fund. But of course, it is a delicate balancing act and we need to ensure that the lifetime benefits justify the higher upfront cost. You may be aware of the recent Cost Optimised Domestic Electrification report, which gives some insight into the lifetime costs of different electric heating*

*technologies. And we are undertaking further work to try and quantify some of the longer-term benefits of ground-source heat pumps.*

1.32. Why is the grant for ground source heat pumps (GSHPs) so low? This puts them at a serious disadvantage.

1.33. Has BEIS chosen ASHP as the preferred technology?

1.34. Increase in ASHP installs can potentially lead to an increase in fuel poverty given lower levels of efficiency and higher cost of fuel. Can this be mitigated by increased incentives for GSHP?

1.35. By balancing it this way the heating load from gas and oil will be transferred into electrical demand. By biasing it towards Air Source the electrical demand will be far greater in the winter when the COP of the air source falls dramatically vs the ground source. Has this been quantified?

*Analysis indicates that Air-Source Heat Pumps are a cost-effective solution to decarbonising homes and more widely suitable across the UK housing stock, compared to Ground-Source Heat Pumps. This analysis includes research done by Delta-EE for BEIS in 2020 (Source: [www.gov.uk/government/publications/cost-of-installing-heating-measures-in-domestic-properties](http://www.gov.uk/government/publications/cost-of-installing-heating-measures-in-domestic-properties)), which suggests that the current total installed cost of an Air-Source Heat Pump in an average UK home is between £7,000 and £14,000, including the costs associated with changes to radiators and pipework, compared to the current average installed cost of a Ground-Source Heat Pump in an average UK home which can be between £15,000 and £35,000.*

*However, we recognise that Ground-Source Heat Pumps offer a number of benefits compared to Air-Source Heat Pumps and are generally more efficient, particularly at times of peak system demand. This is part of the rationale for offering an uplift in the grant available under the Boiler Upgrade Scheme for Ground-Source Heat Pumps over Air-Source Heat Pumps. However, we need to make best use of the budget available under the Boiler Upgrade Scheme. A proportionately higher grant level in relation to overall cost has been set for Air-Source Heat Pumps given that evidence suggests the majority of existing properties are suitable for this technology and therefore this specific section of the market needs to grow substantially ahead of the introduction of proposed regulatory and market-based levers later in the decade, and to meet our commitment of 600,000 heat pump installations per year by 2028.*

1.36. As a designer of Ground Source Heat Pumps, the applicability of ground source is generally understated. The incorrect assumption that they are not able to be installed in dense urban environments must be challenged. Secondly, the infrastructure investment that ground source represents needs to be better recognised. Ground loops are a 100 year

plus investment which gives the technology radically different investment case to other technologies.

*We share your view that Ground-Source Heat Pumps can be a viable solution in dense urban environments, and this is supported by extensive Government and independent evidence. The longevity of the ground array also makes Ground-Source Heat Pumps an attractive technology when considering lifetime costs and emissions. This is why we have taken the decision to support such systems through a number of different schemes, including the Boiler Upgrade Scheme, Green Heat Network Fund and Social Housing Decarbonisation Fund.*

## Heat Pump Supply Chain

1.37. How many skilled installers trained and registered to MCS standards is it anticipated will be needed to install 600,000 heat pumps per year?

*The Heat Pump Association estimates that over 30,000 qualified heat pump installers will be needed by 2028. Industry estimates there are currently about 3,000 heat pump installers, and 130,000 oil and gas heating engineers.*

*Our heat pump support programmes will continue to require installation businesses to be certified under the Microgeneration Certification Scheme or an equivalent scheme.*

1.38. How does re-training of gas heating micro-SMEs fit in to the policy framework?

*Government sees the upskilling of existing heating engineers, including gas engineers, as crucial to meeting demand for heat pump installations. In 2020 BEIS launched the Skills Training Competition, which awarded £6.9 million to support training for tradespeople delivering green home energy improvements. This included heat pump training.*

*Government is also working with industry to ensure that available training is of a high quality. In August 2021, the Heat Pump Association launched a new Ofqual accredited upskilling course for existing heating engineers, which has support from both heat pump and boiler manufacturers. This course can be completed in under a week. By the end of 2021, industry expects to have capacity to upskill over 7,000 heating installers per year to install heat pumps. This is sufficient to ensure we have enough installers, if training is taken up.*

*We welcome suggestions from industry on how we can remove any remaining barriers to installers in SMEs undertaking heat pump upskilling, or taking on apprentices, and explore possible options for providing support.*

1.39. Maybe 10 friends / family members in London asked me about getting a heat pump installed. The real issue is that there are not installers to recommend them to! We had an ASHP installed over the summer in NW London - installer came from Reading! This needs addressing really quickly - demand is up already...

*The Microgeneration Certification Scheme 'Find a Contractor' tool can be used to identify Microgeneration Certification Scheme Certified installers: <https://mcscertified.com/find-an-installer/>. The tool suggests that there are a number of installers based in North West London. However, we agree that we will need to significantly increase the number of trained heat pump installers to deliver our 2028 target of installing 600,000 heat pumps per year. Ensuring installers have confidence that demand for heat pumps will increase will be crucial to ensuring they upskill.*

1.40. Are there any plans for more scrutiny of installation and installers? We've had a lot of issues with our MCS accredited installer

*All government funding for heat pump installations requires that installers be accredited with the Microgeneration Certification Scheme (or equivalent scheme). This ensures that installers adhere to a consumer code, and have the skills needed to deliver high quality installations.*

*All heat pump installers in England and Wales must also comply with Building Regulations. In 2021, Government consulted on changes to Building Regulations and the accompanying the Approved Documents, which provide practical guidance on how the Building Regulations can be satisfied. These proposals included additional guidance on the standard expected of heat pump installations. The consultation closed in April 2021 and Government is currently considering responses to the consultation.*

1.41. Is there a standard tool or approach currently available for sizing heat pumps?

*There are a number of tools available for sizing heat pumps. In April 2021, the Microgeneration Certification Scheme launched a new EN 12831 compliant Heat Pump Calculator to help installers undertake room by room heat loss calculations to allow for the appropriate sizing of heat systems (<https://mcscertified.com/mcs-launch-new-improved-heat-pump-calculator/>).*

1.42. Some engineering friends of mine and me are thinking of starting a heat pump manufacturing facility in the UK, the heat pumps we are thinking of manufacturing would incorporate soon technical innovations which should improve efficiency by a not insignificant amount. What help/assistance could we get from BEIS?

*Alongside support through innovation programmes such as this, we have also created an enabling framework to support investment in UK manufacturing. This includes measures*

*like the Super Deduction Capital Allowance Scheme and Export Finance, to help grow manufacturers export market.*

1.43. How do you see savings in the manufacture of heat pumps when they are already part of an established global supply chain through air con?

1.44. Will parity with gas boiler prices be based on current pricing or do you expect gas boiler prices to be higher as stricter regulations kick in?

*Heat pumps are manufactured as part of a global supply chain, but independent assessment of the supply chain identifies significant opportunity for cost reduction in a number of key areas, including installation and consumer acquisition costs. We welcome the commitments made by a number of manufacturers and suppliers to significantly reduce the cost of heat pumps and bring them closer to parity with fossil fuel boiler prices.*

1.45. I don't think that consumers will have enough technical knowledge to know what system to use and what is best for them, so how can they be expected to make that decision?

1.46. On customers being advised on the best solution, they seem to rely on their installer to advise who may already have in mind the solution they want to provide. How do you see that being avoided and consumers know who to speak to independently to get the right advice? Many independent advisors do not have the correct information so where does the consumer go?

*We need to support consumers and installers in the transition to low-carbon heating, and part of this journey is sharing best practice and offering impartial advice. Services like the Simple Energy Advice website provide independent advice to consumers on energy efficiency and low-carbon heating measures. This will allow consumers to make more informed decisions. In addition, we must ensure installers have appropriate training to enable them to make a fair judgment on the best solution for every consumer.*

## Heat Pump Network Considerations

1.47. Every heat pump, no matter the size requires permission from the DNO, many areas especially rural require major upgrades to the infrastructure. How is this going to be addressed?

*Not every heat pump requires permission from the Distribution Network Operator ahead of installation. Our analysis suggests less than 1 in 6 heat pumps installed in the UK submit an 'Apply to Connect' request to the Distribution Network Operator ahead of installation.*



*Distribution Network Operators are required to submit plans to the regulator for each price control period to ensure they have enough funding to deliver the investment required to meet expected demand and that this investment is delivered in a cost-effective manner. Distribution Network Operators are due to submit their final business plans to cover the period 2023 to 2028 in December 2021 and Ofgem will reach a determination on the adequacy of these plans in 2022.*

1.48. I had a quote from my DNO of £2.5k to provide a new supply upgrade from 60amp to 100amp. (up to 80 would be free to resident, but for 100amp the cost falls to the home (and for a HP, PV & EV along with electric cooking – so full-degassing), it was deemed 100 amp supply was required). How will Government address this killer hurdle?

*As part of their Access and Forward Looking Charges Review, Ofgem are reviewing how charges for new connections and network reinforcement are passed on to consumers. They have published a minded to position which would see part of these costs socialised across billpayers.*

1.49. Some DNO are procuring flexibility services, but these are limited to specific geographical areas of constraint on the network. How could larger portfolios of domestic controllable heat pump 'loads' (owned by social landlords for example) be incentivised to offer total system, as opposed to DNO specific, energy network management services?

*We agree that that controlling heat pump loads could provide a source of flexibility and there are a number of service providers developing new models for unlocking this potential. We are open to trialling such services through the Heat Pump Ready Programme.*

## Other Policy Issues Relating to Heat Pump Deployment

1.50. Are permitted development regulations going to be reviewed? PD is currently a bit of a barrier to ASHP deployment on flatted developments. A pair of semi-detached properties with an ASHP each could still comply with permitted development. The same building but as flats (so individual dwellings on top of each other as opposed to side by side) would require full planning. We have seen some LPA that have very restrictive noise standards for ASHP installs that require planning - significantly more stringent than PD which result in planning refusals as they cannot be met. Incidentally, the counterfactual solution - gas boilers - wouldn't meet these noise requirements (due to boiler flue gas emission noise!) but as boilers do not require planning in flatted properties, it's not a problem.

*The majority of heat pumps are installed under Permitted Development. However, we accept that in a small number of cases, planning standards and regulations can raise*

*additional barriers to some heat pump installations. We are keeping the current approach to permitted development and noise emission standards for heat pumps under review.*

1.51. Heat pumps do not work well with radiators. Should we not be considering air to air heat pumps for new build. Essentially reversible air conditioning, a well-established technology.

*Hydronic heat pump systems (i.e. those connected to a wet central heating system) have been proven to work effectively with radiators. However, because a heat pump operates at a lower flow temperature than a typical gas boiler installation, accommodating a heat pump may require changes to the size or specification of pipework and radiators to ensure they can deliver the levels of thermal comfort required by consumers.*

*That being said, changes to pipework and radiators are not required in every case, as many heat distribution systems are already compatible with heat pumps. Furthermore, we are supporting the development of innovative solutions, like higher temperature heat pumps, which can avoid the need to make changes to heating distribution systems, through projects such as the government's Electrification of Heat Demonstration Project.*

*While air-to-air units can provide an efficient solution to heating homes in some cases, an air-to-air solution would still require an alternate heating source for hot water. Whereas a hydronic heat pump can provide both hot water and home heating in a single low-carbon solution.*

## SMETER Programme

1.52. Can we have more information about SMETER and heat pump sizing?

1.53. Is it possible that SMETER-type performance measurements will be a recommended or required part of a heat pump specification and installation process or that they would be optional?

*BEIS will shortly be launching new work building on the SMETER competition, to consider over the next few months how a system of in-use performance metrics could be developed. This suggestion may be considered as part of this work.*

1.54. A key part of validating the success of a heat pump install is the efficiency/COP. To do this you clearly need to know the electricity in & heat out, this could be done with extra electricity & heat flow meters but at significant additional cost. Would it be possible to mandate that these metrics are measured and available in a standard format through all HPs, they already have the necessary measurement equipment installed so this would allow quality assurance in a cost-effective manner. It's also data that's likely to be required by a SMETER device.

*BEIS will shortly be launching new work building on the SMETER competition, to consider over the next few months how a system of in-use performance metrics could be developed. This suggestion may be considered as part of this work.*

## Section 2: Ofgem Programmes

2.1. Will the strategic innovation fund be available to just network providers or those planning to improve the network as well i.e local authorities or registered providers such housing associations?

*Energy networks are currently required to lead an application, but they are also required to partner with at least one third party. This could include a local authority, housing developer, technology developer etc. We strongly encourage collaboration between energy networks and third parties in funded projects.*

*Distribution Network Operators cannot currently lead an application until April 2023, but can also partner as a third party.*

2.2. Can you confirm the definition of the lead applicant for the SIF fund. Caught its opened up to DNOS in 2023.

*For this initial round of challenges only gas transmission, gas distribution, electricity transmission and the Electricity System Operator (ESO) licensees are eligible to apply as lead applicant. Electricity distribution network operators (DNOs) are encouraged to participate, but they cannot lead a project. DNOs will be eligible for the SIF in April 2023.*

*For this first round of Discovery phase an Offshore Wind Transmission Owner (OFTO), an Independent Distribution Network Operator (IDNO), or an Independent Gas Transporter (IGT) qualify as an 'other type of energy network licensee' in the 'Whole System Integration' and 'Data and Digitalisation' challenges. A list of networks is available [here](#).*

2.3. We would like to engage with the Ofgem fund but are having difficulty finding anyone that's entering and eligible. Is there any scope to change the eligibility requirements to allow more varied (and innovative) projects?

*The SIF setting of Innovation Challenges and associated funding calls will be based on a strategic need. The SIF has been designed for flexibility and to meet the need for network innovation as and when it arises, keeping pace with requirements for the evolution of networks. The SIF is intended to respond to the needs of industry and we continue to work with Ofgem and the energy networks to improve third party participation. We welcome feedback on issues third parties have had with participation to the [SIF\\_OFGEM@innovateuk.ukri.org](mailto:SIF_OFGEM@innovateuk.ukri.org) mailbox, which will help to address any issues in the design of future challenges.*

2.4. Can the SIF funding support heat network projects, as well as electricity/gas networks?

*Yes, if the heat network proposal can demonstrate benefits for the energy network or energy network user or consumer. See 'Section 2: Eligibility Criteria' of the [SIF Governance Document](#) for full requirements.*

2.5. If we have a mature offering to help Innovate, the process we can work with UKRI to be connected to an Energy Network provider. How can we move ahead with this?

*This years competition has closed. However, Innovate UK are always looking for new disruptive innovations to take forward in future SIF challenges, which will be set periodically each year. Download, complete and return the ['project on a slide'](#) and email to [sif\\_ofgem@innovateuk.ukri.org](mailto:sif_ofgem@innovateuk.ukri.org)*

*In addition, it is recommended that you contact both the [Energy Networks Association \(ENA\)](#) and the [Energy Innovation Centre \(EIC\)](#) to submit your project proposal.*

2.6. The SIF requires a network operator to apply. This makes it hard for businesses to get involved in the programme. Is there any support available?

*Through the SIF programme, Innovate UK is offering a brokerage service to form partnerships and collaboration. Presently networks are no longer taking innovation ideas from 3rd parties forward for consideration under the current strategic challenges. However, Innovate UK are always looking for new disruptive innovations to take forward in future rounds. Download, complete and return the ['project on a slide'](#) and email to [sif\\_ofgem@innovateuk.ukri.org](mailto:sif_ofgem@innovateuk.ukri.org)*

*It is also recommended to contact the [Energy Innovation Centre](#). The EIC acts as a conduit for small and medium sized innovators and technology companies. It is also recommended signing up to the [KTN](#) to find out the latest news on funding or calls for energy innovation.*

2.7. From the eligibility criteria described and our understanding of the non-gas applicants to the Ofgem fund this very much feels like Government picking winners and choosing hydrogen for this significant innovation fund. Heat pumps are effectively excluded as a result of the eligibility criteria.

*The latest Strategic Innovation Fund Heat Challenge scope requirements explicitly mention heat pumps and heat electrification as areas of focus (referenced below). Whilst electricity distribution networks are currently ineligible to lead SIF applications the SIF challenges do encourage collaboration between different types of energy network. Meanwhile the Distribution Network Operators (DNOs) are still able to access innovation*

*funding through Ofgem's price control mechanism via the Network Innovation Competition.*

*Heat is recognised as a priority challenge for network innovation, to facilitate the decarbonisation of heat at best value to the consumer and energy network customers. Innovate UK (UKRI) welcome any feedback on priority areas or opportunities for innovation for future heat-related challenges.*

*"You should consider all the points listed here, but as a minimum you must directly address at least one as the primary focus of the proposed project:*

- using smart approaches to manage large-scale electrified heat deployment in a local area, reducing the need for network reinforcement*
- using smart meters with heat pumps to optimise usage and energy system flexibility*
- the commercial and investment case for financing heating technologies alongside energy network innovation*
- working with partners on how deployment of low carbon heating solutions can be better coordinated to minimise gas and electricity network constraints at lowest economic cost"*

2.8. Is there any opportunity to broaden the scope of the eligible organisations to the Ofgem Innovation fund?

*This is under consideration; the SIF setting of Innovation Challenges and associated funding calls will be based on a strategic need. The SIF has been designed for flexibility and to meet the need for network innovation as and when it arises, keeping pace with requirements for the evolution of networks. The SIF is intended to respond to the needs of industry, and we continue to work with Ofgem and the energy networks to improve third party participation.*

2.9. Is it fair to say the SIF is therefore aimed at gas and electricity network operators? Rather than, say, heat pumps manufacturers or project developers?

*Energy networks are currently required to lead an application, but they are also required to partner with at least one third party. This could include a heat pump manufacturer, local authority, housing developer, technology developer etc. We strongly encourage collaboration between energy networks and third parties in funded projects.*

2.10. We want to take part in SIF but need help to get a partner to apply with. Can you help?

*Through the SIF programme, Innovate UK is offering a brokerage service to form partnerships and collaboration. Presently networks are no longer taking innovation ideas from 3rd parties forward for consideration under the current strategic challenges. However,*

*Innovate UK are always looking for new disruptive innovations to take forward in future rounds. Download, complete and return the [‘project on a slide’](#) and email to [sif\\_ofgem@innovateuk.ukri.org](mailto:sif_ofgem@innovateuk.ukri.org)*

*It is also recommended to contact the [Energy Innovation Centre](#). The EIC acts as a conduit for small and medium sized innovators and technology companies. It is also recommended signing up to the [KTN](#) to find out the latest news on funding or calls for energy innovation.*

2.11. The other potentially useful networks for heat distribution are water and sewers. Is the SIF applicable to these networks?

*The SIF is open to Energy Network Innovation only. Innovations which deliver benefits for energy network users and consumers which involve the regulated networks would be considered under ‘Whole System Integration’ challenge.*

2.12. It seems that SIF applications can only be made after partnering with a DNO. Can BEIS assist in affecting introductions to suitable DNO’s or are we expected to do that ourselves?

*Electricity distribution network operators (DNOs) will be eligible for the SIF in April 2023. DNOs are encouraged to participate, but they cannot lead a project until then. Through the SIF programme, Innovate UK is offering a brokerage service to form partnerships and collaboration. Presently networks are no longer taking innovation ideas from 3rd parties forward for consideration under the current strategic challenges. However, Innovate UK are always looking for new disruptive innovations to take forward in future rounds. Download, complete and return the [‘project on a slide’](#) and email to [sif\\_ofgem@innovateuk.ukri.org](mailto:sif_ofgem@innovateuk.ukri.org)*

*It is also recommended to contact the [Energy Innovation Centre](#). The EIC acts as a conduit for small and medium sized innovators and technology companies. It is also recommended signing up to the [KTN](#) to find out the latest news on funding or calls for energy innovation.*

2.13. Can you please clarify how the SIF fund will be aligned with the Heat Pump Ready Programme?

*The clustering of heat pumps will require innovative technologies and solutions to overcome any challenges for the energy networks.*

*Innovate UK will work with the energy networks, to coordinate the specific network innovations requirements as a result of activities being undertaken elsewhere as part of the Heat Pump Ready Programme.*

*Based on these requirements, the SIF could develop new challenges for the energy networks. In the first instance, these challenges could be led by the Electricity System Operator or Electricity Transmission Operators. Other examples may include challenges focussed on whole system approaches for the wider energy networks or demonstration projects on the electricity Distribution Network in early 2023.*

*Doing this will leverage greater value for both funds and foster cross industry collaboration.*

2.14. Heat Pump Ready part of the SIF?

*No SIF is run by Innovate UK - [mailto:sif\\_ofgem@innovateuk.ukri.org](mailto:sif_ofgem@innovateuk.ukri.org) is the main contact email.*



## Section 3: Heat Pump Ready – Stream 1

### Definitions/ Overview

- 3.1. What is the definition of 'High-Density'?
- 3.2. Please can a clear definition of what qualifies as 'high density housing' be provided? Is the only criteria based on of homes on the same LV network or are there others / exceptions?
- 3.3. what does high density mean? is this just for new builds?
- 3.4. 25% Density of take up in a secondary substation area: Would you consider dropping this requirement? Gas households converting to electricity is a tall order. The easiest starting point in the near term is when the gas boiler is coming to the end of its life. Dropping the density requirement would help with this and also with local grid impact. It is also of limited policy significance: the key policy issue is about getting take up to scale not local density of take up. In later years, with changing market and pricing signals, higher density will more naturally occur.

*One of the key objectives of this innovation programme is to demonstrate coordination of deployment in a local area and to better understand the solutions to managing the localised demand on the supply chain and electricity network.*

*High density is defined as at least 25% of the domestic buildings on at least one low-voltage feeder network or at least 25% of the domestic buildings connected to the same secondary sub-station within a chosen location.*

- 3.5. Is it possible to link the programme to a green heat network funded project i.e. use this to trial?

*No, heat networks are not in scope of the Heat Pump Ready Programme. Heat Pump Ready defines a consumer heat pump as 1 per home, whereby the home is a house or 1 per multiple homes in the case of a multi-occupancy building (i.e. block of flats). Heat Pump Ready would however support 'shared' infrastructure (i.e. shared ground loop / borehole) connected to these individual heat pumps.*

- 3.6. How can you bid for the heat pump funding as a local authority and which stream would be best to bid for?

*Local Authorities should refer to the Slide 7 in the Supplier Engagement slide packs which details current programmes available for heat pump funding.*

3.7. How is 'network innovation' defined - in relation to being ineligible for funding?

*'Network innovation' is any innovation required by the energy networks – upstream from the consumer meters.*

3.8. What is your position on innovation coming from other countries? Do they need a UK partner to be eligible? Would BEIS see its role finding the right partners in the UK? We have tested our idea in a test run in The Netherlands, can we apply now in UK?

*As Stream 1 is a pre-commercial procurement competition, to secure funding in this programme, these **innovative methodologies must not have been tested in the market or commercialised, this includes other countries.** Stream 1 is open to applicants from outside the UK, however methodologies must be developed and trialled targeting a specific UK location.*

3.9. The presenter mentioned building archetypes – given there a number of models do you have a view on the model/framework for archetypes you will want used?

*There is not a specific model/framework, in this context archetypes referred to typical types of UK housing stock.*

3.10. How are these studies different from the BEIS electrification of heat demo project from earlier this year? What were the learnings from that project?

*The Government's previous £14.6 million Electrification of Heat Demonstration Project was designed to gather data and further our understanding of deploying heat pumps across a range of different housing archetypes and consumer groups. This programme builds on this, by providing funding to find technology solutions, tools and processes to increase the deployment of heat pumps. Learnings from the BEIS Electrification of Heat Demonstration Project will be published in due course.*

3.11. BEIS Electrification of Heat Project appeared to struggle to deliver high numbers of heat pumps with 100% funding. How do you expect businesses to install comparable numbers with no capital funding?

*BEIS are providing funding for innovative means of consumer engagement as part of Stream 1's eligible costs to support with the recruitment of consumers. Capital funding for heat pumps is available through a range of grant programmes which was details in the presentations. As part of producing an optimised approach to heat pump deployment, it is*

*expected that successful projects will unlock cost reductions to consumers as a product of their optimised approach.*

3.12. Is the Heat Pump Ready program linked with the BEIS Electrification of Heat trial?

*No, Heat Pump Ready and Electrification of Heat Demonstration Project are two stand alone programmes. However, learnings from Electrification of Heat Demonstration Project have been used in the development of the Heat Pump Ready Programme.*

3.13. How many heat pumps is the Heat Pump Ready program looking to deploy?

*Heat Pump Ready does not have a target number of heat pump it is looking to deploy. It is not a deployment programme, instead the focus is around developing innovative optimised solutions to high density heat pump deployment and the tools and technologies to overcome some of the barriers to deployment.*

3.14. By not allowing any component of a bid for phase 1 to having been commercialised previously - do you not risk missing out on impactful technology that can be used to gain great efficiencies?

*The innovation element of Stream 1 is around the innovative methodology for optimising the heat pump deployment opposed to innovative for example in the heat pump technology itself. Stream 1 projects are able to use heat pump and other technology currently available in the market as part of their methodology, however the high density deployment methodology itself cannot have been previously tested in the market or commercialised.*

3.15. Heat Pump retrofits can work best (lower lifetime cost of ownership, better energy flexibility to power networks etc) if integrated with home energy efficiency measures and other hardware such as ventilation heat recovery, PV-thermal panels, thermal stores, and smart controls (all available technologies). Will any of the funding Streams/Phases cover the design-integration-test of such packaged solutions (using largely off-the-shelf components) for particular housing types, prior to trialling the roll-out installation method?

*Stream 1 methodologies could include the installation of additional retrofit measures (as mentioned in the question) however the primary focus of the methodology must be heat pump deployment. The inclusion of these additional measure could for example reduce the cost for consumers or enable financing models to be viable.*

3.16. Relating to the streams do you have to apply for stream 1 and 2 in order to receive 3?

*Both Streams 1 and Stream 2 will be required to participate in Stream 3 activities. Projects do not have to be successful in both Streams to participate.*

3.17. It was said that householders need advice on the type of heat pump best suited to them. Do you mean you want projects to be manufacturer agnostic?

*Yes, it is important that consumers received the most suitable heat pump for their circumstances rather than a particular brand of heat pump.*

3.18. The majority of consumers don't want to play an active role in the heat market and prefer to have a passive role. How will BEIS measure this success as part of the innovation programme?

*Overall success will be measured by projects meeting the targets of heat pump deployment, which BEIS expects to occur in properties with passive consumers, given these are the majority. Differing levels of engagement should be accounted for in Stream 1 consumer engagement plans.*

## Funding

3.19. Is this funding compatible with other funding streams? eg ECO4, GHNF?

*Heat Pump Ready Stream 1 projects are able to apply for any funding available in the UK which funds the capital cost of heat pumps, installation or energy efficiency measures. Application to these funding streams should be part of the methodology developed – an overview of these funds are included in the supplier engagement event slidepacks.*

3.20. Provide clarity for Phase 1 - funding threshold is £50k min, £300k max. But BEIS expected to support "up to 15 projects" (ie £200k \* 15projects). Suggest that with budget of £3m, there's an opportunity to support for up to 60 projects?

*60 projects would be funded if every project applied for the minimum eligible total project costs – however BEIS appreciates there will be projects submitted across the allowable funding range, giving an estimate of 15 projects to be funded.*

3.21. Is there a cost to the consumer to engage in this trial?

*Yes – consumers will be required to pay for their heat pump under Stream 1, whether that be through personal finance, government grants, mortgages, loans, or other financing options available in the market.*

3.22. Why are capital costs ineligible?

*Funding is available already in the market for the capital cost of heat pumps – please see a slide included in the supplier engagement event slides which details this.*

3.23. Is it possible to use government grant funding to contribute to capital costs of heat pumps installed as part of the programme?

*Yes, Stream 1 project teams are able to, if that is part of their innovative methodology, to apply to government heat pump grant programmes – an overview of these is provided in the supplier engagement slide packs.*

3.24. Stream 1 Phase 2a and 2b have a budget of £27m and target of 6 trials (£4.5m average and £9m max). These seem very high project v costs if equipment is ineligible. Would you consider making equipment costs eligible and/or increasing the expected number of Phase 2 projects and lowering the expected average size.

*The funding limit of up to £27m is fixed. If projects submit proposals with lower than the average cost estimated, BEIS will have the ability to fund additional projects. BEIS welcome feedback around this area as set out in the Programme Engagement Document.*

3.25. With 80% of installation being private domestic and no capital or installation costs are eligible there may be an issue in financing this element of the project?

*Stream 1 projects are able to apply for government heat pump grant programmes, should they wish, as part of their methodology.*

3.26. Are costs for evaluation and monitoring an eligible cost for stream 1? Can we assign time of a monitoring and evaluation officer who will help evaluate the impact of the project and feed into BEIS?

*BEIS is not expecting monitoring and evaluation to be carried out by the stream 1 suppliers. BEIS may seek input or feedback on monitoring and evaluation processes from the project teams. BEIS does expect some knowledge management and dissemination activities to be carried out by stream 1 and these would be an eligible cost for stream 1.*

3.27. Are you looking for applicants to develop and commercialise innovative methodologies to deploy heat pumps, as per usual operation of IUK's approach to SBRI? Or are you looking for IP and methodologies to be shared more widely for the greater good of the sector and net zero agenda?

*BEIS are following the standard SBRI approach. Details of IP ownership will be set out in the draft contract terms issued with the Public Engagement Document and finalised in the subsequent ITT.*

3.28. Average cost in stream 2 seems very high if no equipment cost. Would you consider a larger number of phase 2 projects and/ or allow equipment costs?

*The total funding level for the Stream (£30m) is fixed, however BEIS are open to feedback from suppliers on the cost vs. number of projects.*

## Installation/Types of Heat Pump

3.29. Is it a requirement for these Stream 1 projects that the procedures of PAS2035 be followed?

*All Stream 1 project methodologies should comply with the current, applicable, standards and regulations in the market.*

3.30. To what extent will allocation of pilot projects be shaped by regional climate (i.e. heat pumps are likely to perform differently in the South compared to the North.

*Further guidance on the funding allocation process will be set out in the competition guidance.*

3.31. Can communal systems heated by 1 heat pump be included?

*Yes, a communal heat pump (defined as 1 heat pump per property with multiple homes – i.e. block of flats) would be eligible.*

3.32. Are shared loop ground source heat pumps in scope?

*Yes, shared ground infrastructure (i.e. loops or boreholes) would be eligible whereby this is connected to individual property heat pumps.*

3.33. Are thermally driven heat pumps eligible?

*No, this programme only supports electrically driven heat pumps.*

3.34. Are heat pumps that tap into heat stored in water bodies eligible?

*Yes, heat pumps which use heat stored in water bodies will be eligible whereby individual properties have their own heat pumps.*

## Eligibility

3.35. Is there a limit/requirement for retrofit to existing buildings vs new build?

*Yes, new build (pre-occupation) is limited with further details provided in the Programme Engagement Document.*

3.36. Are there any limits on how many projects an organisation can be involved in? Can an organisation be involved in projects in each Stream?

*Yes, limits will be set on the number of Stream 1 projects an organisation can participate in. Stream 1 participants will also be able to participate in Stream 2 projects. Full details will be set out in the Invitation to Tender and Competition Guidance.*

3.37. Will the 15% maximum off gas properties limit the location of rural projects?

*BEIS welcomes feedback on this limit as part of the Programme Engagement Document.*

3.38. Is there a minimum distribution requirement of domestic scale HP and building/larger scale HPS?

*Yes, the methodology developed should apply to predominately domestic properties, however a maximum number of trial buildings as part of the methodology trial can be non-domestic. Further details are provided in the Programme Engagement Document.*

3.39. Is there a minimum and a higher limit of buildings included in a study/project? and can the study be for one building type only like only new build housing or must it be a mix of housing types and non-domestic?

*The high-density requirements of the trial require at least 25% of the domestic buildings on at least one low-voltage network or connected to the same secondary sub-station within their chosen deployment trial locality. In a location whereby all 25% or more of the domestic buildings on the low-voltage network are the same building type, this would be eligible.*

3.40. What level of Public Liability will you be requiring Small Medium Enterprises to hold?

*Public Liability for phase 1 will be twice the value of the contract. Liability for phase 2 will be £4m or twice the value of the contract (whichever is higher). This applies to all organisations.*

3.41. Can you elaborate on the sort of companies you are expecting to lead these projects and what sort of collaborators/subcontractors you might expect to see?

*BEIS are open to any legal entity applying to lead projects which meet the aims and objectives of the Stream.*

3.42. Do you have an example of the ideal sort of project you would like to fund?

*BEIS do not have an example of the ideal sort of project we'd like to fund, our aim is to fund innovative methodologies for high density heat pump deployment – we appreciate these could come from any area of industry, academia or other sectors.*

3.43. What are you expecting in terms of partnerships coming forward for the ITT? Does a bid have to be led by a NIC eligible party (i.e a DNO)? What sort of partnerships would you expect the lead applicant to have built to support the bid?

*Not expecting bids to be led by a DNO. Open to new and innovative way of doing things so not prescriptive on what the consortium needs to be. Providing overall capability and capacity.*

3.44. Can you elaborate on the sort of companies you are expecting to lead these projects and what sort of collaborators/subcontractors you might expect to see?

*BEIS are open to any legal entity applying to lead projects which meet the aims and objectives of the Stream.*

3.45. Are there specific types of orgs that can submit an application, or are there any restrictions as to who can apply, and can they apply with partners?

*There are no restrictions on the type of organisation that can apply or who they can partner with as long as they are eligible to receive SBRI funding.*

3.46. How would Heat Pump Manufacturers specifications be allocated?

*The heat pump manufacturer specifications would be managed and allocated by the Stream 1 project teams.*

3.47. It looks as though some Stream 2 projects could be complementary to Stream 1 projects - how will BEIS actively encourage this co-ordination?

*Stream 3 provider will have the ability to matchmaking done through engagement of the project teams.*

3.48. Can you also confirm that projects based on Scotland are eligible in Stream 1.



*Yes, Stream 1 projects based in Scotland are eligible.*

3.49. Can Smart DCC take part?

*Full details regarding organisation eligibility will be published in future Competition Guidance.*

3.50. We are a small company (4 persons) are we too small to apply?

*Any legal entity, independent of size, is eligible to apply.*

3.51. We're also involved in the City Decarbonisation Delivery Project phase 3 (CDDP3), led by the Heat Networks team. The two projects sound very similar please can you clarify how they interact? Could CDDP3 work be seen as a pre-cursor to a feasibility study as part of the HP Ready Programme or should they be seen as separate things and be focussed on different areas of the city?

*Heat Pump Ready is independent of the City Decarbonisation Delivery Project Phase 3. Heat Pump Ready is not looking to deploy head pumps in areas which are suitable for heat networks. Applicants will be asked to detail why heat pump are the most suitable technology for the area which they will be looking to trial their methodology. Due to the different timelines for projects, they should be seen as independent projects.*

3.52. Given the electrification of heat's biggest barrier is likely to be the electrification of transport, will pilots that also EV charging also be considered or is it heat only?

*Yes, methodologies can include other elements of renewable technologies, such as EV charging, however the primary aim of projects must be the deployment of heat pumps.*

## Commercial

3.53. SBRI usually requires at least 50% of the contract value to be defined as R&D. Is this the same with phase 2 as the eligible costs didn't look like R&D activities as they are usually defined?

*Phase 1 is R&D focused on the development of the innovative methodology for high density deployment of heat pumps. Phase 2 then goes on to trial the innovative methodology developed in Phase 1.*

3.54. The SBRI mechanism is a great way to trial and deploy innovative technology. It is a shame that the tools and tech development stream is separate and I'm assuming R&D grant based? Are there plans to look at an SBRI call in future that could deploy and trial technologies developed through stream 2?

*There are currently no plans for a follow on SBRI for Stream 2 projects. BEIS are encouraging 'match-making' between Stream 1 and Stream 2 projects, so that where possible Stream 2 projects can broker deployment and trial opportunities as part of Stream 1's methodologies. However, it is not compulsory for Stream 1 project methodologies to include Stream 2 technologies and it will be up to projects to negotiate their own terms for involvement.*

3.55. Will there be any opportunity to ask questions about the T&Cs after they are published / shared? Will they be included with the programme engagement document?

*Yes, BEIS are aiming for the Terms & Condition's to be published alongside the Programme Engagement Overview Pack. Suppliers will be able to provide feedback on these T&C prior to the formal Invitation to Tender being issued.*

3.56. As someone with an interest in heat policy, but who is completely new to the SBRI process I am still struggling to understand how it works. Does BEIS have a 'beginners guide' to SBRI?

*Further details of SBRI's can be found here:*

*<https://www.gov.uk/government/collections/sbri-the-small-business-research-initiative>*

## Section 4: Heat Pump Ready – Stream 2

### Definitions/Overview

4.1. Which stream does training and upskilling of installers fit into please?

*Training innovation is covered as elements in Stream 2, under Category 2: Minimising home disruption whilst providing high quality installation. Innovative methods of installer training (beyond standard qualification and certification – i.e. any bespoke methodology specific training) would be eligible in Stream 1.*

4.2. Is the Stream 2 competition for domestic or commercial systems only?

*Stream 2 supports innovation for systems up to 45kW capacity, which is typically domestic systems. The focus on Stream 2 is to support innovation which impact domestic heat pumps.*

4.3. Could the focus of this programme be frame as ‘heat pumps OR alternative technologies’ which provide more efficient, cheaper and easier to use products? Does this process cover the options of an alternative to heat pumps?

*The Heat Pump Ready Programme is directly in support of policy areas which is specific to heat pumps.*

4.4. Does Stream 2 support EOL recycling of refrigerants?

*Innovation regarding EOL recycling falls outside of the scope of the Heat Pump Ready Programme, however we are supporting the development of alternative refrigerants which may have a lower environmental footprint.*

4.5. Does Disruptive technologies only apply to technologies, or does it include different business models?

*Stream 2 includes innovation on tools, technologies and processes, which could also include innovative business models.*

4.6. In the presentation you mention Great Britain in some slides and the UK in others. Does this mean you do not consider Northern Ireland to be part of Great Britain where you mention Great Britain specifically?

*Applications are welcome from organisations across the UK (including Northern Ireland). Any trial or demonstration should test new tools or technology under Great Britain's energy market and regulations, where relevant.*

4.7. Where does insulation and ventilation of homes feature to make heat pumps work well? or is it part of another funding stream? if so, how is it connected to the heat pump ready programme?

*Innovation on insulation and ventilation falls outside of the scope for the Heat Pump Ready Programme.*

4.8. Does domestic include district thermal energy systems?

*District heat networks / thermal energy systems is outside of the scope of the Heat Pump Ready Programme. For the purposes of this programme, heat pump within scope of the programme are those which belong to/are installed within an individual property, with a property being an individual home, or building which houses multiple homes (i.e. block of flats).*

4.9. How do we apply to the Energy Entrepreneurs Fund?

*Further details of the Energy Entrepreneurs Fund are available here:*  
<https://www.gov.uk/government/collections/energy-entrepreneurs-fund>

## Funding

4.10. Please clarify - is a level of match funding required on every project? So this is not 100% funding for projects, and we need to find someone else to fund the amount not funded by BEIS?

*Yes – Stream 2 is a grant funded programme which adheres to subsidy control measures. Match funding is required by all organisations which are conducting economic activity, with levels of grant intensity varying with organisation size and type of innovation activity. Further details on this will be provided in the Programme Engagement Document and the Competition Guidance.*

4.11. If an individual company applies to the competition, can the company match fund the grant or does this need to come from an external party?

*Yes – match funding can be private investment from the organisation applying. Applicants should note that match funding cannot be attributable to any public authority or EU institution.*

4.12. Will there be a higher level of funding percentage available for micro-SMEs (specifically for companies with less than 5 employees)? Gather that current funding would be up to 60% - but I could be wrong!

*No, micro-SME's will receive the same grant intensity as small businesses. For small businesses the grant intensity ranges from 60 to 80% depending on the type of innovation being carried out as part of their project. Further details on grant intensities will be set out in the Competition Guidance.*

4.13. Where does fitting of appropriate demand reduction / fabric improvement measures and ventilation fit into the 5 work areas of stream 2? Is this getting sufficient focus ahead of heat pump deployment?

*Fitting appropriate demand reduction / fabric improvement measures could be a secondary benefit of many areas of the Heat Pump Ready Programme, for example a project developing a tool to recommend the most suitable type of heat pump for a home (primary benefit) could also include recommendations on demand reduction and fabric improvement measures (secondary benefit).*

4.14. To clarify a previous question, we don't need funding nor want to agree to 'knowledge sharing' but want to show our technology capability, can this be done?

*Note: This question has been interpreted as you do not wish to apply for funding under the Heat Pump Ready programme, however, would still like to showcase your technology to the broader heat pump sector.*

*As part of the broader Heat Pump Ready Programme, there will be periodic engagement events (led by Stream 3's provider) which will be open to those operating in the heat pump sector outside of projects funded through Heat Pump Ready. This could be an opportunity to showcase your technology.*

4.15. Would you be able to indicate the expected project size in terms of budget?

*BEIS will provide up to £2m of funding per project. For an organisation with a grant intensity of 60% wishing to be funded the full £2m, this would equate to a total project cost of £3.3m (£2m being 60% of this value). Project are eligible to request BEIS funding below the maximum grant intensity – for example an organisation wishing to be funded £2m of a £5m project, this would equate to a grant intensity of 40%. Note all project costs, must be eligible under the project eligibility criteria. BEIS welcome feedback on whether suppliers would welcome/discourage a maximum total project size being set.*

4.16. Are there any funding limits for HE partners within a project? Will the FEC costing method be allowed for university partners?

*Yes, funding limits will be in place for higher education partners within a project. Full details of this will be provided in the Competition Guidance. A key point to note for universities, researchers, third sector organisations, etc. is that clarification will be required that they are conducting non-economic activity. Non-economic activity is defined as work which could not be done by the private sector. If a private company could do it, then it is considered economic activity.*

4.17. Is it possible to apply for a project with requesting 100% non-economic activity to be funded?

*100% non-economic activity will not be eligible as part of Heat Pump Ready Stream 2 as the aim of the Stream is to support innovation through to commercialisation and promote investment into the heat pump sector. There will be a percentage limit of project activity which can be defined as non-economic activity published within the Competition Guidance.*

4.18. Can the company making the bid contribute the match funding in their own resource, for example if we had a project that was valued at £100 and we bid for 80% funding, can the remaining 20% be funded by us providing the staff and facilities that would be needed to deliver the project as a whole (obviously costed out to show it wasn't included in the 80% funding).

*Match funding contributions can be 'in-kind' contribution (i.e. staff time, facilities) however these 'in-kind' contributions must be eligible projects costs and be included in the project finance break down. 'In-kind' contributions cannot be outside of the project costs or in addition to the total project funding.*

4.19. Are consumers the only stakeholder we're looking to engage with?

*The programme aims to disseminate learning and knowledge to a broad range of stakeholders across the heat pump sector.*

4.20. Will training of installers be within scope of of Stream 2?

*No, Stream 2 does not provide funding to train installers.*

## Eligibility & Application Process

4.21. What should someone do who has a project idea which fits into 2 categories?

4.22. What happens if you cover more than one technology area?

4.23. Can an organisation make applications for different Tools and technology areas / categories?

4.24. Can you confirm that an organisation can submit multiple applications to the stream for different projects in the same category?

4.25. Can a business submit multiple applications? / Is there a limit to the number of applications a business can submit?

*Organisations are welcome to apply for more than one Stream 2 Category with projects which are significantly different – i.e. the same project cannot be submitted to multiple categories – applicants must decide which category the project is most applicable to. Where organisations are involved in applications to multiple categories with different project scopes, organisations will be required to detail how, such they be successful with their applications, they will resource the projects to a satisfactory level. Applicants are welcome to email BEIS for advice on which category they best fall into, however the final decision on which category applicants submit to, remains with the applicant.*

4.26. We have IP that could be applied to improve efficiency and size of heat pumps, but do not want to disseminate until patents filed and partners found. What is the IP policy on details submitted as part of the application process?

*Applications to BEIS are treated as commercially sensitive. With regards to the dissemination as part of the project, under the Grant Funding Agreement, project are required to disseminate elements such as project details, findings and outcomes – note this does not require commercially sensitive details to be shared publicly. With regards to the ownership of IP, please see the Grant Funding Agreement which will be published alongside the Public Engagement Document which sets out ownership and licensing rights.*

4.27. Why only one category per organisation?

*BEIS has noted the feedback on the number of applications per category and will provide further guidance as part of the competition documentation.*

4.28. For eligibility criteria for stream 2, point 1 states that will fund TRL 5-8 at project start, but point 3 (project status) states that BEIS cannot fund projects which are at TRL 8-9 at start of project. Which is correct?

*This was a typo in the original slide pack and has been amended in the published set of slides.*

4.29. Where does fitting of appropriate demand reduction / fabric improvement measures and ventilation fit into the 5 work areas of stream 2? Is this getting sufficient focus ahead of heat pump deployment?

*Innovation for technology for demand reduction and fabric improvements is outside the scope of the Heat Pump Ready programme. From a tools perspective, this would be eligible for inclusion under Category 4. Improving consumer journey, if for example, an innovative tool with the primary aim of advising consumers on the most suitable heat pump for their home was being developed. This tool could include, as a secondary aim, advice on demand reduction and fabric improvement measures.*

4.30. Will the application form be tested before issuance? The Social Housing Decarbonisation Fund one had fundamental flaws in it which were not rectified and resulted in incorrect values being replicated across the workbook.

*The Heat Pump Ready Programme uses a different application platform and will be quality assured ahead of applications opening.*

4.31. Do potential projects need to make support available to all domestic households or could they focus on specific groups (e.g., low-income households) or geographies?

*The Heat Pump Ready Programme aims to support a broad range of consumers, therefore tools and technology should not aim to support specific consumer groups, unless there is a specific evidenced rationale as to why a bespoke tool or technology is required for that consumer group. Applications should note that if they are applying into Category 3 – Financial models to support heat pump deployment: this only supports projects which are applicable to a range of homeowners or householders.*

4.32. Does the requirement of minimum TR5 not risk reducing delivery on the SIP/Heat Pump Ready Programme aim of gathering and developing ideas that could lower barriers to adoption etc. Any possibility of lowering the minimum TRL5 requirement? (TRL 5: "Laboratory Testing of Integrated/Semi-Integrated System: The basic technological components are integrated with reasonably realistic supporting elements so it can be tested in a simulated environment.").

*The aim of Heat Pump Ready Stream 2 is to support innovative tools and technologies through to being commercially available by the end of their projects (reaching TRL 8/9). Experience has shown it typically takes along than 30 months for projects to progress from TRL <5 through to commercialisation, however BEIS welcomes feedback on this element.*

4.33. In a consortium, is the grant intensity for the whole project defined by the lead organisation or is it per organisation within the consortium?

*For consortium applications, each organisation as part of that consortium is assessed for their grant intensity. For consortiums of varying organisational sizes, this would result in a variety of grant intensities for the organisations involved.*



4.34. What is a TRL?

*TRL is Technology Readiness Level. Further information is available here:*

*<https://www.gov.uk/government/news/guidance-on-technology-readiness-levels>*

4.35. For example, demonstration / validation / rigorous testing of new technology would be OK? This would be at TRL 4-5

*The start TRL is defined as the TRL at which the majority of the work to date has been complete to – for example 20% may be at TRL <5, 60% at TRL 5 and 20% at TRL >5 – this would equate to a start TRL of 5.*

4.36. Within the context of dissemination of information how will IP rights be protected? How is IP ownership linked to dissemination and info sharing?

*There is a clear distinction between intellectual property and the reporting of project outcomes and lessons learnt. The focus on dissemination is that of the outcomes and lessons learnt. Further details on IP and dissemination requirements will be provided in the competition guidance.*

## Section 5: Heat Pump Ready – Stream 3

### Conflict of interest

5.1. Please may I clarify the COI between the 3 phases... am I correct in understanding you can't bid for Streams 1 & 2 if bidding for Stream 3?

*The appointed supplier for the Heat Pump Ready Stream 3 will be partly responsible for assessing effectiveness and impact of Stream 1 and Stream 2 projects and disseminating the work of these Streams.*

*BEIS therefore considers that there is potential for an actual or perceived conflict of interest if companies who bid for this work were to bid for other work in this programme, i.e. the Stream 1 or 2 roles or the Evaluation Contractor competitions. In their tender response, all tenderers (regardless of which competition they are bidding for) are required to ensure that any actual or perceived conflict is declared and satisfactorily mitigated.*

*BEIS reserves the right to exclude any proposals where the bidder has an actual or perceived conflict of interest that cannot be mitigated to the satisfaction of BEIS.*

*i.e. suppliers can bid for stream 3 and other streams, however, they must robustly justify (to BEIS's satisfaction) how they would mitigate any actual or perceived conflict of interest should they win a stream 3 contract and a contract in another stream.*

5.2. What is the planned Evaluation Contractor competition? What will be the scope of this contract, and what is the expected timing?

*In addition to the evaluation activity carried out in Stream 3 of Heat Pump Ready, there will be a separate NZIP evaluation project looking beyond the Programme. This thematic Evaluation work will, among other areas, assess the impacts of HPR on the broader heat pump sector and the perceptions, intentions, and actions of key heat pump stakeholders. This work will take place toward the end of the programme, however additional scoping is still being carried out and BEIS is not currently in a position to provide expected timings of any procurement of this work.*

5.3. Does Stream 3 include the creation of a project/program website?

*Further details of exact requirements regarding websites will be included in the Invitation to Tender.*

5.4. Will the Stream 3 contractor be involved in choosing the projects/contractors for Stream 1 and Stream 2?

*No, the Stream 3 provider will not be involved in choosing/assessment applications to Stream 1 or 2.*

5.5. Will we be required to share learnings and intellectual property across all streams? (not just 3)

*All projects within Heat Pump Ready will be required to share learnings/outcomes of their projects – however we do not intend that this includes intellectual property or commercially sensitive information.*

5.6. Is there anything we'll need to do before phase 1?

*Exact timeline for activities will be set out in the Invitation to Tender, however Phase 1 of Stream 3 includes the planning of work to be carried out in Phase 2.*

5.7. Will we know in advance which Local Authorities are selected for Stream 1 Phase 1?

*No, Stream 3's provider will not know which projects under either of Stream 1 or 2 have been successful before bid submission. The Invitation to Tender will include numbers of projects etc. to enable pricing to be conducted like-for-like.*

5.8. Are all of those reports shared with stakeholders outside of BEIS?

*There is a range of reports and dissemination material which will be produced by the Stream 3 provider, it is BEIS's intention that all will be shared publicly, with bespoke dissemination material produced for key stakeholders.*

5.9. Do you expect the Stream 3 contractor to be a consortium or a main contractor that works with sub-contractors? Is there any benefit to the Stream 3 contractor being a consortium of multiple partners?

*BEIS are open to whatever structure delivers the against the criteria and skills set out in the invitation to tender.*

5.10. Are you expecting to model or measure the difference between gross and net electricity use between control and deploy group? Concerned that there is an assumption that heat pump deployment 'must' increase loads on networks.

*BEIS requires an understanding of the impact on energy use as a result of heat pump installations both at the household level and network level, and expects this to involve*

*comparing the ‘deployment’ group with a control group. Beyond this, contractors are welcome to suggest an approach to undertaking the analysis, which can include measuring the difference between gross and net energy use.*

5.11. Do you have an indicative budget for the Stream 3 contract?

*Up to £5m (ex-VAT).*

## Section 6: 1-to-1 Question & Answers

### Heat Pump Ready Programme Definitions/Overview

6.1. Are there particular barriers to heat pumps deployed in high density that you would like addressed in the response to the Programme?

*Stream 1 (SBRI) is looking at innovative methodologies to deploying heat pumps in high density (funding is around methodology development not tech / r&d).*

*Stream 2 is a Grants programme with 5 categories for application looking to address certain barriers from a technology and tools from a heat pump deployment perspective. More information is given within the slide packs.*

*Stream 3 is a contract for a knowledge transfer and learning provider with who is responsible for gathering and sharing knowledge across the entire programme.*

6.2. Are projects eligible under any of the streams to improve the situation of poor quality of data, which will impact technology?

*None of the Streams has the specific objective of improving data, however this will be addressed across the programme. Stream 1 will be required to install heat pumps and relevant energy efficiency and supporting measures that are optimised for each home, as well as monitor and quality assure heat pump operation, which will require the collection of data about properties and heat pump performance. In Stream 2, categories 1 and 5 focus in part on heat pump monitoring and flexibility, which will require improvements in data quality. Stream 3 will require data on heat pump performance and householder energy data to undertake their activities. If there are specific data you are wanting improvements on, then please let us know.*

### Programme Logistics

6.3. What is the timescale for the bidding process?

*Timescales are provided in the engagement slide packs available on the Heat Pump Ready website. We are looking for an early December competition launch.*

6.4. Will the Guidance documents define high density housing?

Yes.

6.5. Why do each of the streams follow a different procurement framework?

*The procurement method is tied to the desired aim and objectives of that specific element of the programme. Stream 3 is buying a service; Stream 2 is commercialising technology and Stream 1 is a pre-commercial methodology.*

6.6. Has BEIS found any specific consumer concerns already? Will there be a publication of any of those, perhaps in an engagement document?

*BEIS aims to publish the Electrification of Heat Demonstration Project findings shortly and this will likely be useful in providing evidence of consumer barriers that need to be addressed.*

6.7. Is there a specific format the response should be in?

*Further details will be given in the programme engagement. The formal competition will not be opened until early December. Stream 1 and 3 will be going through Contracts Finder and Delta portal. Stream 2 is a grants programme and will have a separate online application form. Full details of the specific format for responses will be published in the Competition Guidance / Invitation to Tenders.*

6.8. What are the time scales for doing work?

*The overall programme runs May 2022 – end of March 2025. However, there is opportunity for more rapid, shorter projects in Stream 2 of the programme.*

6.9. Are the projects fully funded?

*This depends on what stream you are applying to. Stream 1 is an SBRI is a pre-commercial procurement with 100% of eligible project costs funded. Stream 2 is a grants programme which requires match funding of a percentage of the eligible project costs. Stream 3 is a contract where we are buying a service and therefore the work is 100% funded.*

6.10. Can we lead in multiple bids within each stream?

*Yes – but number you can lead in is to be confirmed, a limit will be communicated in due time.*

6.11. Can one applicant bid for multiple streams?

*Yes, but will have to submit conflict of interest declaration, this will be set out again the Programme Engagement Document.*

6.12. Is there match making to create consortium bids?

*Please look out for details in the Programme Engagement Document.*

6.13. How will SME's be supported to find consortium partners?

*Please look out for details in the Programme Engagement Document.*

6.14. Can academic partners take part?

*Yes, full details will be set out in the programme engagement documents.*

6.15. If we are already funding by another organisation e.g. UKRI, can we still be funded by the programme?

*Yes, you can apply for funding for a new, significantly different project as part of Heat Pump Ready, even if your organisation has received funding for elsewhere, such as UKRI. Where match-funding is required (Stream 2) this cannot be from another public funded source.*

6.16. What level of interdisciplinarity is preferred?

*The level of interdisciplinarity is up to applicants and is not set by BEIS.*

6.17. Can we use a local model for innovation? Do we want large scale from the off?

*Yes, Stream 1 can address local innovative solutions to heat pump deployment, as long as the density required as part of the programme is achieved.*

6.18. Are you interested in foreign companies at all?

*Stream 2 is R&D which is grant and then match-funded. With these projects, if there is a formal consortium, then we require these companies to be UK based. If there is an ability to link up with UK companies, acting in a sub-contractor role, then this is allowed although there is a limit to the amount of sub-contract work taking place.*

*In stream 1, the trials would take place in Great Britain. We would expect the trial activity to take place in GB, as we would not fund the hardware.*

6.19. Is there ability to match make a foreign solution with UK?

*Yes, full details will be set out in the programme engagement documents.*

6.20. Is Northern Ireland eligible?

*Stream 1 projects must be based within Great Britain. In stream 2, applicants can come from anywhere in the UK.*

## Stream 1

### **Definitions/Overview**

6.21. High density – what does it really mean?

*High density is defined as 25% of the low voltage network to 1 sub-station.*

6.22. How critical is high density? There is the GRID challenging for the DNO and for residents the easier sell is when they need to replace their boiler systems. Is there scope to look at high volume?

*High density deployment is a critical component of the innovative methodologies in Stream 1. The programme is looking at addressing these challenges which result from high density deployment. A part of the criteria is making sure the methodology is sustainable and replicable.*

### **Installation/Types of Heat Pump**

6.23. Which party is responsible for making sure that the technologies fit the right technical and safety standards to be put into homes? Which party provides the technical approval and assurance?

*This is up to the Stream 1 provider to detail as part of their proposed methodology (e.g. ensure they have quality assurance plans in place). BEIS and the Stream 3 provider will not be involved in the negotiations between Stream 1 and technology/tool providers. If Stream 1 wish to use a Stream 2 provider, the 2 projects will be responsible for negotiating between themselves. Stream 3's role is to provide an opportunity for introduction/networking, to gather learning and evidence, to look at the bigger picture rather than any specific Stream 2 technology.*

6.24. How interdependent are the interventions considered? There is extensive deployment of insulation and ventilation associated with the proper installation of heat pumps.

*Heat Pump Ready is focusing on achieving deployment of heat pump with any associated measure such as insulation and ventilation being part of the journey (where applicable) to heat pump deployment. The primary benefit we are seeking is the installation of heat*



*pumps. Note: The heat pump capital costs, installation, insulation, or other energy efficiencies products are not eligible costs under Stream 1.*

6.25. The heat pump may not work properly if it is installed ahead of the insulation. Surely the first stage of a retrofit is to put in the insulation (which would need ventilation as well).

*As part of the Stream 1 methodology, project teams should be assessing each home to understand what the optimum heat pump solution is for that specific property. In some cases, this could mean the installation of insulation, in others it may be more optimal for heat storage or solar pv. BEIS enforcing insulation as a requirement of Stream 1's methodology as we are seeking as close to a "real-life" solution as possible.*

6.26. Are BEIS specifying which type of heat pumps can be used (i.e., high or low temperature)?

*No, at present, we are only specific on hybrids. Further details will be published as part of our Programme Engagement Document.*

6.27. How will cooling be dealt with? When is cooling turned on?

*No specific answers arounds this currently. Heat Pump which provide both heating and cooling can be used if best fit for the consumer the aim is to produce an innovative methodology which provides the right solution for the consumer.*

6.28. Is there capacity to bid for rural and urban?

*We will be providing more information on this in the Programme Engagement document.*

6.29. Can you use a High Street shop as part of consumer engagement?

*This would be allowed.*

6.30. Is it acceptable to contact known brand suppliers?

Yes

6.31. Who are the main manufacturers of heat pumps?

*This is not something which BEIS can comment on.*

### **Eligibility**

6.32. In workstream 1, did you want 25% properties on a low voltage connected to a secondary substation?

Yes

6.33. If we attempt to measure low-voltage feeder modelling for one substation with four feeders, we are potentially into very high consultancy numbers. Could the 20% social housing be from ONE of the feeders? What are the criteria for the different layers?

*In terms of social housing, BEIS would be happy with this being on one feeder at this stage. We simply want to avoid 100% social housing, since we need to also include private landlords.*

6.34. If we had a working technology that greatly sped up deployment of heat pumps, would this be suitable for Stream 1? There is already considerable installing of Heat Pumps already occurring.

*Stream 1 is not for technical development. Stream 2 is for research and development. Stream 1 is about how to engage with customers, recruit them for the product and then install the product. The aim of Stream 1 is to ensure that there can be an installation on a low voltage network and to get the whole process done on a street-by-street approach. Stream 1 is welcome to use any technologies and tools existing on the market as part of their approach.*

6.35. Would the creation of an electric village fit Stream 1?

*This is fine so long as this is not new build; there is a limit to the proportion that can be new build (5% of total installations).*

6.36. We are considering retrofit of properties within a small town. It is currently a constraint management zone. We intend to install a variety of renewable technology, one of which is heat pumps with no new substation will be created. Does this fit the streams?

*BEIS are looking to provide innovation funding to optimise the methodology for high density heat pump deployment. Therefore, a purely deployment project would not be eligible.*

6.37. Will there be a requirement on bidders regarding customer guarantees protection for legacy systems?

*Stream 1 is looking for the methodology to include consumer protection and quality assurance for heat pumps installed as part of that trial.*

6.38. What companies did you have in mind to be part of this project?

*BEIS are very open to any companies regardless of size and experience – as long as they have the ability to meet the aims of the programme with an innovative approach.*

6.39. Is there zoning issues, can work focus in purely 1 region?

*We are asking people to apply with a project in a specific local area. Methodology whilst area specific, should also be replicable in other areas with a similar nature.*

6.40. What if we would like to look at innovation for ASHPs?

*This could be eligible for Stream 2 funding.*

6.41. Is there room for packages i.e. HPs and Solar PV?

*The innovative methodology developed in Stream 1 should focus on providing the optimum solution to the consumer. If this optimum solution requires solar pv, the coordination of its installation can be included.*

6.42. Can you apply for Proprietary technologies that work with heat pumps?

*Stream 1 does not fund proprietary technology development. These (depending on the project) may be eligible under Stream 2 grant.*

6.43. How does TRL5 affect eligibility?

*In the application you explain your current TRL level, and how the project will move up the TRL scale. The entire TRL of the project will be assessed, i.e. you may have carried out work above/below TRL 5, however the TRL should be based on where the majority of work to date has been conducted. Projects applying with a TRL less than 5 will not be assessed.*

6.44. How open is BEIS to new solutions?

*BEIS welcomes new solutions to overcome heat pump barriers.*

6.45. What level of matched funding would a micro-SME achieve from stream 2?

*Match funding requirements range depending on the size of organisation and type of innovation being carried out. Further details will be included as part of the Programme Engagement Document.*

6.46. If you have a tool useful for customer, but you did not want money, would this be considered for stream 2?

*The tool would require funding to maintain it beyond the life of the BEIS project – i.e. for maintenance and hosting. BEIS would require, at the application stage, details of how this would be funded.*

6.47. For Stream 1 – what is the TRL needed?

*Stream 1 is not TRL based, it is a pre-commercial procurement of an innovative methodology.*

6.48. Is a borehole geothermal energy system eligible?

*BEIS has not specified the source heat to be used with the heat pump. This heat could come from a geothermal system if it met the eligibility criteria for the programme.*

6.49. Considering trial focused on shared heating for new housing development – would that be eligible?

*Only a small proportion of trial house are eligible to be new build homes.*

### **Evaluation**

6.50. Is there any consumer protections agreements in place?

*Stream 1, as part of their innovative methodology development is responsible for developing the required consumer protection agreements required for their proposed solution.*

### **Funding**

6.51. Are we able to combine funding from this tender with the recent Ofgem competition?

*Yes, BEIS encourage applicants to seek funding from both Heat Pump Ready and Ofgems Innovation Programmes. However, they are ran as 2 separate, aligning programmes, with their own application, assessment, reporting and monitoring processes.*

6.52. We are currently getting Industrial Strategy Challenge Fund funding, can we ask for more funding that way?

*Your methodology will need to be sustainable beyond the project, so you will need to know the gap funding and future funding the next time it is rolled out.*

6.53. For stream 1, can customers take advantage of the heat pump grant scheme?

*Yes - anything funding available in the market, including grant funding, private financing, other sources of funding can be used to fund heat pump capital costs.*

6.54. It seems the capital costs of the materials isn't included, its more looking at the assessment of it?

*BEIS are seeking the development and trial of solutions for high density heat pump deployment.*

6.55. Is there scope for [consumer] recruitment costs being eligible in Stream 1?

*Yes, an eligible cost of Stream 1 projects is innovative means of consumer engagement and recruitment.*

6.56. Are BEIS open to reducing the level of funding in order to fund more projects?

*The funding level, per stream, is fixed however the number of projects is not fixed. If there is a lower cost per project, there will be funding available for other projects.*

## Stream 2

### Scope

6.57. Will this stream support hardware, firmware and process twin design for manufacturing processes?

*This would depend on the outcome of the project they would need to be innovation projects which fit within a challenge area.*

### Eligibility

6.58. Are you open to the question of the optimum level of insulation needing to be installed with a heat pump being investigated?

*Heat Pump Ready does not fund purely research exercises. Stream 2 could support the development of tools with identify the optimum heat pump solution for homes, taking account of energy efficiency measures and renewable generation as part of the optimised home solution.*

6.59. Would BEIS be interested in innovations (tech dev) related to insulation as part of this programme?

*Heat Pump Ready does not support innovation solely related to insulation.*

6.60. Would producing a process digital twin be in scope?

*This would depend on the commercial use of the digital twin and the innovation requirements associated to the project.*

6.61. With regards to heat pump redesign; would modular heat pumps be in scope?

*Potentially, depending on the barrier the project would aim to meet and the innovation requirements of the project, along side meeting other eligibility requirements.*

6.62. If looking at cell-based manufacturing – is prototype factory for manufacturing in scope?

*Setting up a cell-based manufacturing site would not be in scope as there would be no innovation requirements within the project. Applicants should consider who the beneficiary of the activity is, what's innovative about it, what TRL you would be at.*

6.63. How about controls that are developed to capture already existing heat pumps – is this in scope?

*This could be eligible under Stream 2 and would depend on the commercial model looking to be used and the innovation requirements of the project.*

6.64. Business model development, is this a key part of the applications?

*Stream 2 has financial models to support heat pump deployment, but you will have to show what is innovative about the project.*

6.65. Is tweaking refrigerants and looking at different compressor designs in scope?

*Yes, as long as not just a research project. There should be a clear commercial end product achieved through the innovation project.*

6.66. Can technologies for housing associations be applicable?

*We are not accepting applications for just housing associations. The innovations should work for the broadest range of consumers.*

6.67. Would a private business work for stream 2?

*Yes, as it would need to be doing economic activity.*

6.68. Are innovative solutions for noise reduction in scope of the competition?

*Yes.*

6.69. Do university's fall under scope?

6.70. Should Stream 2 be led by industry – what would we expect from Unis?

*Universities don't fall under scope as a lead. There will be a cap on amount of project work which can be carried out by a university seeking non-economic activity funding.*

6.71. Are you using the FEC costing methods? Is this 80% as usual?

*Further information on this will be published within the competition guidance.*

6.72. Is this similar to UKSA calls with 30% cap?

*Further information on this will be published within the competition guidance.*

6.73. Can you explain Economic and non-economic?

*Economic is any activity that could be done by the market. Non-economic is only for universities for example using specific equipment for testing and demonstration.*

6.74. Expected TRL at the start 5-7 – are we looking to developed concepts that are demonstrated during the project?

*BEIS are looking for already technologies and tools which have already been tested in a lab and will be taken through to commercialisation during the life of the project.*

6.75. What is the timeline for Stream 2 projects?

*Stream 2 – rapid 18months, standard up to 30 months.*

6.76. Is Stream 2 open to partnerships?

*Yes, however Stream 2 must be lead by a business.*

6.77. Are you interested in also work related to policy and contribution to policy?

*Heat Pump Ready is not a policy development programme. However, learnings from the programme will be shared with policy colleagues.*

6.78. There are not many UK heat pump manufactures – are there limitations?

*No limitations but the work must be done in the UK, for example testing and demonstration. More detail to be released in the competition guidance.*

6.79. Is there a minimum project value for Stream 2 or a minimum timescale?

*No minimums have been set, however BEIS welcomes feedback on this point.*

6.80. Are we charging time to the project using the same methodology as Innovate UK grant programmes?

*Yes – time will be charged at cost and there will be a series of eligible project costs such as staff time, materials. A review of costs and financial checks will be carried out before grant award.*

6.81. Do we need to be in all 5 categories?

*No, please pick one category.*

6.82. Are technology development solutions eligible for Stream 1 and/or Stream 2?

6.83. If we want to develop a new tech for performance?

*Technology development falls in scope for Stream 1.*

6.84. With Stream 2, would we look for higher TRL for tech that could improve performance

*All Stream 2 project must have a start TRL between 5-7 and end at TRL 8-9. Rapid and normal stream length projects available.*

6.85. How many applications per institute?

6.86. Is there a limit to cost per projects for stream 2?

*Further information will be provided in the Programme Engagement Document.*

6.87. For Stream 2– are BEIS looking for completely new heat pump tech? Can we also do improvement?

*Both in scope if they can demonstrate innovation and meet the eligibility criteria set out.*

### **Evaluation**

6.88. If a piece of software was developed that managed customer interactions, would this be of interest to Stream 2?

*Yes, as long as it could meet the eligibility criteria.*

6.89. Is the intended outcome something that can be shared in some way?

*Looking at Stream 2 particularly, we are providing funding support for R&D and innovation, the aim is to create products and/or processes that are later commercialised or shared in some way.*



6.90. How would you match Stream 2 projects with Stream 1 providers?

*Stream 3 will be co-ordinating introductions between Stream 1 and Stream 2 projects. Stream 1 are not mandated to use stream 2, but we will make sure they are as aware as possible of the different projects.*

6.91. Does this have to be led by a DNO like the SIF?

*No Heat Pump Ready Stream 2 is focused on commercialisation and can be led by any business.*

### **Commercial**

6.92. Within the ITT will there be links to research?

*When the formal competition guidance is published, we will be publishing a research document.*

6.93. Are non-domestic/industry scale heat pump eligible?

*Industry scale heat pumps aren't eligible, we are domestic focused. Stream 1 has a small percentage allowed, however only as an anchor project, if it is to demonstrate research and development. We are not looking to deploy mass heat pumps for industry. The competitions will be going live in early December.*

6.94. What is the maximum grant intensity a collaborative application can receive?

*Depends on specific organisation type and economic vs. non-economical activity. Each organisation will also have their own grant intensity/match-funding requirements depending on size. Further details will be published as part of the competition guidance.*

### **Logistics**

6.95. Where can the information for Stream 2 be found? It was not on the contract finder portal.

*Stream 2 is being organised via the grant process. Competition guidance will be published on the Heat Pump Ready webpage.*

## Stream 3

### Evaluation

6.96. With regards to Stream 3, what is the level of programme management required of the winning contractor? Example areas that this question means are: identifying risks and issues, gaining mitigation plans from other parties and ensuring compliance with these, representing BEIS interests, ensuring other parties achieve their contracts, agreeing data sharing agreements and ensuring that they are carried out, or invoice sign-off after confirming the meeting of technical requirements.

*The Stream 3 provider is about learning and evaluation, rather than accountability and programme management.*

*Stream 1 and Stream 2 will have their own monitoring officers. Stream 3 is not a management contractor role, but rather a social research and knowledge dissemination role.*

*Most of the day-to-day programme management work will be undertaken by a new TTPS contractor. Where data sharing agreements need to be in place and where other parties other than Stream 3 are best placed to implement these (e.g. securing consumer consent to access household energy use data), then Stream 3 will work with Stream 1 projects, and monitoring officers where relevant, to ensure these are in place and carried out.*

6.97. Does Stream 3 involve data collection, ensuring that data is collected and that the data collected is of a sufficient depth to understand the quality of the technology?

*There is cross over between Stream 1 and Stream 3. Stream 1 will develop their own monitoring methodologies to understand the quality of the technologies and support in quality assuring installs. Where applicable and relevant, this data will be shared with Stream 3. Stream 3 will be responsible for collecting and accessing the data they require to undertake their research. For some data, such as household energy use data, this will require Stream 3 working with Stream 1 to ensure the appropriate consent is obtained by households and other stakeholders to access and analyse the data. Stream 3 will also engage in primary data collection.*

6.98. What if the data generated by Stream 1 is incomplete? In that case the work of Stream 3 would be impossible.

*The Stream 3 provider will need to state what data is required to undertake Stream 3 activities, and then work with programme participants to ensure that the data is being collected and accessed. This will include having the relevant data sharing agreements in place. BEIS expects Stream 3 to have an active role in ensuring this.*

6.99. Is the information being collected wider than personal information that is protected by GDPR, but also technical information?

*Stream 3 should identify what data is required to carry out their activities, and then ensure that processes are in place for the data to be collected and accessed. This will involve Stream 3 working with other programme participants. This may extend to technical information.*

6.100. Is there overlap between Stream 2 projects?

*Stream 3's role will be managing synergies between streams, and within projects.*

6.101. Is there overarching consumer research for the programme?

*Consumer research is the responsibility of Stream 3. We expect the contractor to undertake consumer research early in the programme to support Stream 1 projects in understanding consumer attitudes to heat pump. Consumer's will also be a key stakeholder group for Stream 3 when undertaking research into how Stream 1 deployments are being delivered.*

6.102. Can you tell us more about process and other evaluation in the programme?

*Process evaluation is about examining how projects are being delivered in order to learn lessons that can inform future delivery within the programme. Impact evaluation is about assessing and understanding the results of the programme, including areas such as impacts on household energy use from heat pump installations, impacts on technological progress, and impacts on the broader heat pump sector.*

6.103. If only interested in evaluation aspect of Stream 3, would be need to bid as part of consortium?

*Consortium are not mandatory, but expect it's more likely to be delivered by consortium due to the varied nature of skills/expertise. If only interested in one part of the Stream 3 activity, then will need to work with partners to deliver the full requirement.*

6.104. If organisation interested in Stream 2 and Stream 3, although only have capacity for one?

*BEIS are not limiting applications to a single Stream – please see guidance around Conflict of Interest Declarations. An organisation will have to set out how they will manage the delivery of multiple projects, should they be successful in all applications.*

6.105. Data access requirements: is there mechanism for Stream 3 organisation to enforce data sharing requirements.

*BEIS recognise that data sharing is key. BEIS will have data sharing agreements between themselves and the project delivery teams in Streams 1, 2 and 3, which will cover the sharing of relevant data between those contractors. Stream 3 will then be responsible for identifying the additional data sharing requirements that provide them with access to relevant data, and working with projects to ensure these are implemented correctly, including by ensuring data sharing processes are included in project delivery plans.*

6.106. Stream 3 bids: is it possible to submit 'menu' of options – e.g. which trade off different ambitions and costs?

*Bidders will be expected to submit one bid detailing the work they will undertake and the cost. BEIS will provide estimates in the ITT of the activities and outputs expected, to support bid development. Bidders should not submit a menu of options with different trade-offs.*

### **Logistics**

6.107. May we ask further questions about social value, at a later date?

*There will be time for further questions when the programme engagement document and draft terms and conditions are published and when the ITT is published.*