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7th July 2020

Ally Rae
Clean Heat Grant
BEIS
1 Victoria Street
London SW1H 0ET

Ref: Clean Heat Consultation Response

Dear Ally Rae

Since 2008, MCS has been the only recognised Standard for UK products and their installation in the small-scale renewables sector. It is a mark of quality. We create and maintain standards that allows for the certification of low-carbon products and installers used to produce electricity and heat from renewable sources. We are impartial: technology neutral, manufacturer neutral, and supportive of Installers committed to quality installations and consumer protection. Membership of MCS demonstrates adherence to recognised industry standards; highlighting quality, competency and compliance. Our mission is to give people confidence in low-carbon energy technology by defining, maintaining and improving quality.

MCS welcomes the Government's 2020 budgetary announcement of £9 billion funding for energy efficiency measures to decarbonise heat[1]. While we want a longer-term and joined up approach to decarbonising heat in buildings, we note that the Clean Heat Grant Scheme (CHGS) is a single measure intended to form part of a broader policy framework which we expect will be announced later this year.

MCS advocates a comprehensive, broader policy landscape with an ambitious focus on domestic heat decarbonisation. We look forward to understanding how government plans to achieve this and are clear that their approach must be one that that allows microgeneration to flourish as part of a new normal.

With that approach in mind for the sector we have restricted our response accordingly and covered only the LCHC proposals and questions. Our response is based on the combined views of MCS staff, a group of certified installers and several industry experts. Contributors are listed in Appendix 2. We have also consulted a wide range of other stakeholders to ensure that

[1] Budget 2020 – UK Government

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our response is supported by the sector. All our comments are evidence-based using existing data analysis as well as newly produced, informed projections and insights.

At the time of writing MCS is aware of government plans to be announced today for a £5,000 grant scheme that targets 'energy-saving home improvements', reported to attract £2bn of government funding. Given the deadline for this consultation's submission, we have not been able to assess these plans and if and how these relate to the proposed Clean Heat Grant. We would ask for an explanation of the relationship between these schemes, including whether this additional scheme can be made to work in tandem with the Clean Heat Grant.

MCS will play a pivotal role in the delivery of the CHGS to ensure that quality assurance, standards and consumer protection is effective and embedded. MCS is happy to work with and support BEIS with ongoing monitoring, analysis and feedback to ensure that our sector receives continued ongoing support and clear policy signals.

Finally, MCS will continue to provide the industry with Standards, compliance monitoring and the consumer protection that will be necessary for the success of the Clean Heat Grant if and when it becomes a reality, or any other microgeneration initiatives.

Yours sincerely,

Ian Rippin, CEO

Future Support for Low Carbon Heat Consultation - General Points

1. MCS welcomes the proposals for successor arrangements to the Domestic Renewable Heat Incentive (DRHI). The transformation of domestic energy will play a significant role in contributing to the delivery of net zero targets. To achieve this there must be significant growth in the renewable heat technology market supported by investment in skills and awareness raising.

2. We have a number of specific comments on the consultation questions and the proposals which can be found in Appendix 1. In addition, we have more general comments on the overall shape of the future approach to domestic renewables. This proposal needs to be linked to government's wider climate strategy to address the security of energy supply, keep bills down and achieve decarbonisation of our energy supply. Low carbon heating can play a central role in helping to meet these strategy intentions. The UK needs a future-proofed strategy which maximises take-up of low carbon heating at a stable cost to the consumer.

3. MCS has been central to the delivery of various government schemes designed to incentivise the uptake of low carbon heating systems and support market development including Clear Skies, RHPP and DRHI. A concise summary of these can be found in Appendix 3. This response embeds lessons learnt and experience of these incentive schemes. This affords MCS a unique position to provide informed answers based on first-hand experiences to questions around the current proposals.

Policy Framework

4. Funding and incentives for low carbon heat must be designed to underpin the development and expansion of microgeneration. There should be a clear vision of the scope and role of domestic microgeneration within the overall carbon reduction policy and clear, ambitious targets against which we can measure the scale and penetration of the technologies.

5. The sector needs this clear understanding of the policy and plans to grow low carbon heating to help address issues around heat decarbonisation. We also require information that allows the industry to understand how the government will implement its strategy for off-gas and hard to treat properties before the mid-2030s, allowing the sector to plan and invest for the future. The current two-year proposal does not give enough confidence for businesses to scale up, diversify nor invest in training a workforce.

Review of the proposed deployment levels and total funding available

6. We do not see the limited funding of £100 million as in any way adequate to support any significant growth of low carbon technology. We are unclear about the evidence as to how funding on this scale will change or sustain current installation levels, nor how they will make a significant difference to the achievement of the UK's legally binding and welcome commitment to reduce CO_2 emissions[2].

Review of the grant mechanism and flat rate

7. The amount of grant and the flat-rate, technology neutral approach needs reconsideration. A £4k flat grant is too blunt an instrument and fails to take account of the significant cost differences between low-carbon technologies. The grant should be proportionate to supply and install costs which do not appear to be part of the CHGS design.

Technology Bias

8. The CHGS proposal clearly favours Air Source Heat Pumps (ASHPs) as the renewable technology of choice. While these can be an appropriate solution for some consumers, there is a risk that Ground/Water Source Heat Pumps (G/WSHPs) will be overlooked. G/WSHPs may be more expensive up front but they deliver better longer-term savings, both financially and in relation to reduced carbon output.

9. There are several arguments for the consultation to include Solar Thermal in the CHGS, notably; it is attractive, has low installation costs, and has a capability to provide sufficient space heating and domestic hot water. It also has huge potential when coupled with other renewable heat technologies. MCS considers that BEIS should review the evidence provided in our answer to Q40 and reconsider Solar Thermal as a credible technology type that would benefit from incentivisation.

[2] CCC – Progress Report to Parliament 2020

10. There is little costing or take-up analysis of Biomass in the impact assessment. MCS believes this gap has led to an underestimation of the real role that Biomass can play as part of CHGS, in particular in targeting hard to treat properties.

Significant Investment in consumer education

11. The benefits of low carbon heating need to be clear and transparent to consumers and should be coupled with awareness campaigns that aim to change their understanding about domestic energy use and technology options. Even within the limitations of this scheme, without adequate education and information there is a risk that consumers will be directed by sales and marketing to financial vouchers rather than to the right technology. We are confident that government would not wish to potentially incentivise mis-selling.

International policies

12 MCS has been reviewing best practice of renewable heat policy at an international level with considerable interest. The full details of this review can be found in Appendix 4. We believe that there are learnings in the policy approach of other nations, such as Scotland and France, which provides several important drivers for the market, clearly allowing renewable energy to thrive. A whole house approach to energy efficiency in the UK through appropriate packages of support rather than piecemeal and fragmented measures would benefit consumers, the renewables sector and support the drive to reduce carbon emissions.

Post pandemic reflection

13. MCS acknowledges that these proposals were prepared before the Coronavirus pandemic. We would welcome clarity as to whether BEIS will be reviewing its approach and widening it in the light of the post-pandemic recovery requirements which MCS believes should be both effective and green.

Appendix 1

MCS Response to Consultation Questions

Note: Not all questions answered

Q22. Do you agree with targeting support at domestic and non-domestic installations with a capacity up to and including 45kW? Yes/No. Please provide evidence to support your response.

No. We don't agree with targeting support for both domestic and non-domestic. MCS would like non-domestic installations to be excluded from CHGS due to the limited amount of funding available, as well as to avoid the additional complexity of designing a scheme for householders versus a scheme for commercial entities.

We would like to see installations with a capacity up to and including 45kW receiving targeted support. A 45kW capacity limit is consistent with that covered by the Microgeneration Certification Scheme (MCS) for a single renewable heating product. It is therefore a proven, recognised framework for ensuring installation and product standards.

	Capacity			
	1kW - 19kW		20kW - 45kW	
	Count	Percentage	Count	Percentage
ASHP	66,208	97.69	1,530	2.31
G/WSHP	10,840	77.79	2,408	22.21
Biomass	3,939	32.21	12,231	67.79
Solar Thermal	12,521	96.62	423	3.38

Source: MCS Installations Database 2011 - 2019

Q23. Do you agree that support for buildings technologies should change from a tariff to a grant? Yes/No. Please provide evidence to support your response.

No. Due to the short-term nature of this policy, it should be considered whether replacing DRHI at this time with a grant is the right approach.

While we recognise the current DRHI has been generously funded and not had the expected large-scale impact in encouraging the mass uptake of low-carbon heating systems and reducing costs, replacing it with a flat-rate grant of £4,000 will not necessarily support the market even while in a transitional phase.

The CHGS consultation impact assessment based on the £100m budget indicates that the heat pump market would be supported to a similar level as has been the case under DRHI. MCS is concerned that a £4,000 grant spread over two years would only fund 12,500 installations per year, when latest data from the MCS Installations Database (MID) shows that

there were 13,799 Heat Pump installations and 363 Biomass installations registered with MCS in 2019 (Appendix 5, chart 1). At 2019 levels the grant will be over-subscribed by at least 13%.

Our evidence (Appendix 5, chart 3) shows that when an incentive (e.g. RHPP) is introduced, there is a surge in installations, specifically in ASHP installations. If a new grant is introduced, it will likely drive another spike in installations, but most, if not all of the funding could be used up toward ASHP installations. The design of grant application and voucher redemption processes is crucial to be effective and avoid the concerns MCS highlights in answers to Q43 and Q44. The proposed overall grant level is not ambitious enough and it would be likely to be used up quickly without necessary controls. We explore the quarterly grant windows in more detail answering Q36. However, it should be noted that these control mechanisms would result in eight distinct windows of the grant being opened up over the two-year period, skewing figures and creating peaks and troughs in installations. MCS supports a scheme which sees a certain proportion ring-fenced for different groups, for example social landlords. The CHGS should not provide grants for heat pumps installed into all types of new build housing. If we can spread the uptake of low carbon heat technologies fairly, it would also increase understanding of the benefits of these installations more widely. We need to avoid a "rush to the bottom" and not encourage a market that is influenced by hard sales techniques that target the easiest properties, or most vulnerable consumers, for installs with low cost equipment.

MCS considers that the only CHG applications that appear attractive compared to DRHI would be for small ASHP installations delivering poor value for money and not necessarily focused on maximising efficiency savings. More unscrupulous installers could target those vulnerable customers with access to capital and a motivation to contribute to improving climate change.

The grant needs to avoid skewing the market towards the "cheapest" installation using the cheapest products that tend to be less efficient and less durable. Instead the scheme needs to be linked to carbon savings, size, lifetime and efficiency of the product.

While a grant is more accessible and understandable for consumers and removes barriers for those who cannot afford the upfront capital costs, it is most likely to appeal to property owners who are likely to have access to funding anyway. Most incentives like grants and tariffs tend to favour those with more disposable income. This is demonstrated in data provided in Appendix 5, charts 4, 5 & 6a/b/c/d.

The uptake of renewable technology is higher in one person and two-person households which are economically active when compared to larger households with families. In the professional occupations which includes managers, directors and senior officials we have seen a trend that they are more likely to install a G/WSHP. It also indicates that those in higher-income professional occupations are more likely to install low carbon heating systems. MCS concludes that this group is more able to fund the right solution for their property while those in administrative, leisure, care and services roles tend to buy an ASHP – being a lower cost solution.

Another clear trend is those with knowledge of trades including heating and plumbing, are more likely to install low-carbon heating compared to other professions, suggesting that this challenge is one of consumer education as much as an adoption of technology. This shows

that renewable technology is not only more accessible to those with higher incomes, but also highlights the need to address wider consumer awareness as to the benefits of installing low carbon heating.

A recent report published by the Energy Systems Catapult surveyed 2000+ people with most respondents saying that they have heard of the different low carbon heating options. Around half believed that a low carbon heating system would have a positive impact on climate change[3]. Yet fewer than 20 per cent said they were likely to change to a low carbon heating system when they next need a heating system replacement. The main reasons cited were that low carbon heating systems were more expensive and less convenient.

MCS acknowledges that a move towards a grant mechanism would ease the administration of DRHI. We also agree that a well-designed and delivered grant system would be easier for consumers to understand and would help overcome initial upfront cost barriers. MCS urges that if a grant is considered to be the future mechanism, it needs to be part of an integrated package of support, information and advice to help households and property owners access the right low carbon heating system, improve energy efficiency and decrease carbon emissions. Key adjustments needed to deliver the grant most effectively would include:

1. A more appropriate level of overall funding to support a growth in installations as part of a clear pathway to net zero.
2. A grant level that is varied to support different technology markets and reflects the associated supply and install costs.
3. A fair grant application system with ring-fenced fund for RSLs and independent installers.
4. A more defined and targeted approach so that the grant reaches those most in need and those most likely to benefit, including those off grid and those in fuel poverty
5. A grant with a degression mechanism to allow adjustments in grant level based upon demand.
6. As a measure set against a backdrop of other supportive policies.

Q24. Do you agree with our proposal to offer a technology-neutral grant level? Yes/No. Please provide evidence to support your response.

No. MCS wants the grant to vary based upon the technology type, its installation costs and efficiency savings.

The current proposal opens up complexities around selecting the most appropriate renewable heat technology with G/WSHPs, biomass and consumers all at a disadvantage.
Any grant awarded should also be proportional to the costs of the product type, its installation costs and the level of efficiency savings that can be achieved. Similar consideration should be given to the proportional cost of installations in hard to treat properties.

[3] Net-zero a consumer perspective - ESC

We have some concern around how a technology-neutral grant will affect the future uptake of G/WSHPs and a real fear that this already small market will be totally stifled. This new policy clearly favours ASHPs as the renewable technology of choice. While this can be an effective solution for some consumers, there is a risk that other solutions will be overlooked that may be more expensive up front but deliver better long-term savings, both financially and in reduced carbon output.

The flat £4,000 grant as proposed makes small ASHP installations seem an appealing proposition to those without the necessary insights and knowledge. The grant will provide a heavy discount off these types of installations, which in some circumstances wouldn't be the right technology for a consumer.

The total average installation costs (Appendix 5, chart 2) shows that the cost of ASHPs is significantly lower than G/WSHPs. It also shows that since 2013 onwards, the average cost of an ASHP installation has risen year on year.

A package of well-designed financial support is particularly important for those property owners who might benefit from installing G/WSHPs which generally require greater capital expenditure and specialist installation but can deliver greater carbon and cost savings over the long term. This is evidenced in our answer to Q25.

The flat, technology-neutral grant has advantages in simplifying access to incentives for consumers, and potentially being less bureaucratic for installers compared to the DRHI. However, it fails to take into account the nuances of the UK housing stock, and potentially discourages what could be a more appropriate technology for a home. Heat pumps are one of the primary technologies for decarbonising heat but G/WSHPs and ASHPs are distinctive and should be treated as such. This grant fails to address this.

Under the current DRHI regulations a property owner must seek permission from its distribution network operator (DNO) to install a Heat Pump[4]. In the UK three-phase power is very rarely supplied as standard, except to larger properties. Running large heat pumps on single-phase power can present some challenges and DNO's can influence what can and cannot be connected to a domestic supply. In these cases where a Heat Pump can't be installed because of DNO restrictions, Biomass or Solar Thermal could be a viable option and should be permitted if the CHGS is implemented.

The Impact Assessment recognises that G/WSHPs are more efficient, meaning they will generate more renewable heat and emit less carbon than an ASHP. This should provide enough justification for G/WSHPs to be allocated a higher proportion of the grant.

[4] Ofgem – Essential Guide for Applicants

Q25. Do you agree that £4,000 is an appropriate grant amount to meet the aims of the scheme? Yes/No. Please provide evidence to support your response.

No. Evidence on the grant level cited in the consultation is limited. Although the market data is useful, there appears to be no real analysis of policy design to enhance or better understand how grants, loans and incentives can be integrated.

The consultation document refers to the Irish Heat Pump Systems Grant; however, market penetration of heat pumps is historically low in Ireland. Ireland also has a scheme which supports Solar Thermal heating in homes and awards grant 'bonuses' for energy efficiency if completed as a package on a home[5]. Its comprehensive programme of support is linked to its social welfare programme, so citing it as a standalone example does not help understand the wider context.

Looking to France we see that market penetration of Heat Pumps is much greater (Appendix 4).

The total cost of installations in the UK needs to be considered in the context of a much larger international market, especially for the installation of Heat Pumps for which the UK share is tiny. Until Heat Pumps are installed in significantly larger volumes, the UK is unlikely to see a significant reduction in the cost to consumers. This is explored further in our answer to Q26.

Our answer to Q24 explores the negative impact of the proposed grant in relation to ASHPs and G/WSHPs, but we are also concerned about the negative impact of cited costs. Your analysis shows an average off grid ASHP installation costs £10,300.

We disagree that these are true costs. G/WSHP installation costs also need to be considered when determining appropriate grant levels. An oversight of this proposal is that these haven't been included.

For 2019, the average total installation costs (supply and fit) for low carbon heating technology were:

- ASHP mean average cost: £10,918, with average £ per kW at £1,126
- G/WSHP mean average cost: £22,507 with average £ per kW at £1,758
- Biomass mean average cost: £16,144, with average £ per kW at £666
- Solar Thermal mean average cost: £4,511, with average £ per kW at £1,504

Source: MCS Installations Database

Appendix 5, chart 2 shows the average costs (supply and fit) of certified installations by technology type over the previous nine years. This demonstrates, taking ASHPs as an example, that even with the previous incentive schemes and an increase in the number of installations over time, the cost of ASHPs has risen.

To supplement average prices for 2019, MCS has also undertaken modelling to demonstrate current market costs in relation to dwelling types. In devising these sample quotes a set of standard assumptions have been made and it should be noted that any associated building/electrical/groundwork costs would be additional. See Appendix 6 for this illustration.

[5] Sustainable Energy Authority of Ireland - grants

Taking dwelling 2 (a mid-range heat loss renovation property) as an example:

Tech	Install costs	Total DRHI benefit	Capital payback through DRHI	Annual fuel consumption of tech	CO_2 Emissions	Potential Carbon Saving
ASHP	£13,932.14	£11,099.35	5.80 years	£930.07	1642.96 kg CO_2 /kWh	81.07%
G/WSHP	£29,326.71	£32,189.69	5.39 years	£856.01	1512.12 kg CO_2 /kWh	82.58%

Source: MCS certified Installer quote demonstration

With DRHI removed, even factoring in a £4,000 upfront grant it would still be a challenge for consumers to find the remainder of necessary funds. The G/WSHP offers better savings in relation to carbon and efficiencies but would still cost a consumer £25,326.71 under the proposed grant mechanism; as a result, the consultation's cited "psychological threshold" as well as several other barriers to uptake would still exist.

In conclusion, the £4,000 grant isn't enough based upon it being technology neutral and a flat rate. It will drive a market behaviour that likely won't deliver the right solution for every property.

Q26. Do you agree with the recommendation for a flat-rate grant? Yes/No. Please provide evidence to support your response.

No. MCS doesn't agree with the recommendation for a flat-rate grant of £4,000. It is too blunt an instrument which does not reflect the variation in costs for the different low carbon heating systems. This is explored in our previous answer to Q25.

We need to ensure that the most appropriate technology is deployed and that the market does not default to an ASHP installation based on cost when other technology types may be better for the consumer and their property (e.g. G/WSHP installations have lower running costs). This bias is likely to be exacerbated by the fact that while ASHPs are the easiest of the technology types to install and the cheapest market leading product, the technology may not be suitable for certain properties. Consideration for Biomass should also be included as there may be issues with the insulation and air tightness on certain properties. However, there are not many high temperature Heat Pumps currently available. There will be certain properties that are more difficult to heat and therefore Biomass would be a more appropriate solution. Pellet stoves can often generate more heat and may be more appealing to a smaller property. We should encourage consumers to take up the right technology for their property. It is acknowledged that this has always been a challenge, that would be compounded further with the introduction of a flat-rate grant.

We need to consider rural 'hard to treat' properties with higher heat loads, where the grant impact would be negligible. Oil is a more carbon intensive fuel resulting in roughly 30% higher CO_2 emissions per kWh than gas. The carbon savings to be made by switching a property heated by oil to renewables is therefore significantly higher than if switching a property heated

by gas. However, it comes with a higher cost to switch to renewables. A flat rate grant would not be suitable.

MCS believes the ideal grant-based scheme is flexible in its support for the most appropriate low carbon heating solutions for an individual property and if possible, is targeted or ring-fenced to ensure individual consumers benefit most. This would need controls to avoid a high proportion of the funding being secured directly by social landlords that MCS believes should receive a separate source of funding, or indirectly by larger installers or sales organisations able to 'work the system' to encourage grant applications that then translate into higher sales for them.

MCS has commissioned analysis using data from the MID to determine optimal subsidy levels. The objective of the study was to determine the optimum grant level in comparison to the proposed £4,000. The X axis represents the cumulative deployment of low carbon heating and power (sub 45kW). The Y axis represents the installation price to the customer in £/kW, based on 2019 prices. The plot shows experience rates for each technology type, indicating whether prices are decreasing over time in relation to deployment (Appendix 5, chart 7).

The main finding was that Solar PV has become cheaper as more units have been installed. For Biomass and Heat Pumps, prices have remained stagnant over the last 10 years. The data shows that if demand is stimulated at this scale, the only result will be an increase in cumulative capacity, and we will not see a price reduction. UK deployment is not having an impact on a large scale, as Heat Pump installations in the UK are a fraction of worldwide heat pump installations.

This shows that the proposed grant is not going to have an impact over the two-year period and Heat Pumps will remain unaffordable. Therefore, we will remain in the same position with not enough deployment and little price reduction, decreasing the likelihood of a consumer purchasing a Heat Pump. The data also suggests that we need to innovate to reduce Heat Pump costs. There needs to be a combined package of innovation, consumer protection and support.

In summary we disagree with a flat rate grant as:

1. It will represent a meaningful discount on the average cost of an ASHP installation but is likely to restrict consumer choice and limit the use of other more appropriate but more expensive technologies.
2. Over the two-year delivery period, a flat rate grant won't encourage market growth, nor lead to lower prices.
3. It would encourage the 'hard sell' of cheaper products and installations that may not be the best solution for a consumer or their property.
4. It won't effectively target the consumers most in need, and properties most relevant.
5. It is inaccessible for low income households.
6. It isn't an attractive subsidy for those 'hard to treat' and 'off grid' properties where retrofit costs are significantly higher.

7. It should be adjusted for heat load and technology type.

Q27. If you believe a variation by capacity should be considered, please provide evidence to justify a process and level for varying the grant.

Yes. MCS supports variation by capacity. Variation of the level of grant based on the capacity of an installation can better support consumers and their installers choose the right system for their individual property versus one that might be cheaper. This has been explored and demonstrated in other responses.

Q28. Please provide any relevant views to help inform the development of the delivery mechanism.

The administrative burden and application complexities associated with DRHI applications and previous incentive schemes have been an issue for installers and government alike. It is therefore important the administration of a new scheme should be as simple, streamlined and effective as possible.

A concern that has increased since the pandemic and lockdown is any potential cash flow problems for an installer due to only being able to redeem the voucher upon completion of the installation. Installers will need a solid guarantee that the grant will be paid after they have accepted the voucher from a consumer and discounted accordingly.

MCS therefore recommends the following grant mechanism:

- Vouchers should require a 'validation of use' from an installer to signal that a voucher is being allocated and used. An expiry date on 'non-validated' vouchers could then enable the associated funding to be released back into the scheme and a new application would be required. This approach will protect the funding from being pre-allocated to consumers who do not complete their installations in time. An installer should be able to check a voucher is still valid.
- As proposed in the consultation, MCS certification will be required and able to support the tracking of vouchers, so the system can work in tandem with the operation of MCS and its database (MID). Vouchers can be registered alongside the associated installation details on the MID, appearing on the relevant MCS certificate.
- A direct link between MCS and the voucher scheme will protect against grant fraud. Details can be found in answers to Q43 and Q44. In short, a new MCS audit regime planned for 2021 will include a follow-up survey to the customers of all MCS-certified installations and those that attract a Clean Heat Grant. This can help scheme administrators track the use of vouchers / grants against individual installations. This information can be reported on a regular basis or as a live feed via a direct API link that can be built in to the MID, helping track the location of installations, the type of technology, the cost, capacity and date of the installation and the details of the registered MCS installer. As referred to in Q43 and Q44, this can provide a wealth of information to help identify potential non-compliance with scheme rules, gaming or fraud. Possible reporting would include, but not be limited to, installers who attract the most grants for their installations, any difference in the location of the grant applicant and the installation it has been applied to, and an analysis of the timing difference between voucher application and completed (commissioned) installation.

Q29. Do you agree with the minimum efficiency requirements for heat pumps and evidence requirements? Yes/No. Please provide further evidence to support your response.

Yes. If a grant is to be implemented, MCS supports the minimum efficiency requirements for Heat Pumps and evidence requirement. We understand that government's approach would be aligned to the Future Homes Standard (uplift to Part L building regulations), which MCS also supports.

There is scope for further intricacies to be introduced over time. For example, if replacing a gas boiler with a heat pump, the minimum efficiency for this could be higher (SCOP 3.5) based on the energy costs of electricity being three times that of gas. It would place lower burdens on the electricity grid thanks to the more efficient use of grid electricity by a Heat Pump.

MCS certified installers are required under the Heat Pump installation Standard MIS 3005 to provide the customer with a performance estimate for their system, such as flow temperature and Seasonal Coefficient of Performance (SCOP). MCS certified installers are required to explain the costs and benefits of achieving a higher SCOP.

This is the industry recognised Standard; compliance with this requirement forms part of the Scheme's certification scheme.

Q30. Do you agree with the proposal to require electricity metering for all heat pump installations? Yes/No. Please provide further evidence to support your response.

Yes. We believe that electrical consumptive metering as a recommendation (but not a requirement) would be useful.

Meters are a useful mechanism for engaging and educating consumers as to their energy consumption and use pattern. Installations should be monitored on time versus consumption basis so that system efficiency can be monitored, and efficiency maximised longer-term.

G.Gosnell and D.Mcoy, LSE Research Fellows say, "Smart meters are a key enabling technology in developing a more flexible energy system, which will help the system operate more efficiently and allow for increased renewable energy integration, ultimately reducing carbon emissions."

However, proper design of the metering system and its integration into the whole energy system is necessary. It should be noted that smart meters cannot always work at a location. It can also take a long time to get a smart meter installed. Whether a meter is installed alongside a heat pump or not, shouldn't affect the grant payment.

Q33. Please provide views on the appropriate requirements for the heat loss calculation, as well as the minimum heat loss value that should need to be demonstrated.

MCS Standards include heat loss calculations as a minimum requirement; MCS considers these essential to inform a system's design, including the appropriate choice of technology. A heat loss calculator is featured on the MCS website.

Appropriate heat loss calculations and heat loss values should be used to indicate the most appropriate technology for a property, to ensure the selected system for the property is correctly sized and to give the consumer an accurate quotation.

MCS compliance requires that an installer completes accurate heat loss calculations before entering into a contract with a customer. Standard Assessment Procedure (SAP) should not be used to calculate a peak heat loss as it applies mean values for the whole house rather than accurate room-by-room calculations.

MCS is exploring an opportunity for EPC assessments to be extended to include the heat demand of a property. This approach would have the dual benefit of providing an independent heat loss calculation that a consumer can use to secure competitive quotations not influenced by individual installer's heat loss calculations, and could remove what is currently a significant business development cost for installers, who until they are sure a consumer is committed to buying a system from them, are unlikely to complete a comprehensive room by room heat loss calculation.

Q34. Please provide views on any other criteria to ensure that biomass support is focused on hard to treat properties only.

The use of Biomass has not been considered effectively under the current proposal. MCS suggests that an off-grid property is likely to have a higher heat requirement. Under the DRHI almost all (98%) of Biomass installations are off the gas grid. While a Heat Pump should be considered first, Biomass could be the most appropriate solution.

As mentioned in Q33, MCS believes that a clear, prescriptive definition of a 'hard to treat' property is needed. Overall, a holistic approach to energy systems is necessary.

Due to the fluctuating tariff changes under DRHI, Biomass installation numbers have dropped. In 2019 installations totalled 549 units. A chart illustrating the number of Biomass installations registered with MCS under previous schemes and today under DRHI is included in Appendix 5, chart 3. The CHGS would erode this further, as only an estimated 350 units would be installed each year. The proposal is perceived by the Biomass industry as not realising the full value of this technology as a means of decarbonising heat for 'hard to treat' properties.

BEIS has also stated that 50% of off grid properties are now using electric heating[6], indicating progress has been made. However, most of these properties are using storage heaters and are likely to be on a dual rate electricity tariff. This is an inefficient direct use of electrical power and therefore expensive to run and resulting in high carbon emissions.

Q35. What do you consider to be the main consumer protection risks of providing support through an upfront grant and how might they be mitigated? Please provide evidence to support your response to a question

The main consumer protection concern is for consumers being encouraged to invest in technologies that are not most appropriate for them. The customer needs to understand the importance of ensuring that their selected technology can provide all their heating and

[6] Technical Feasibility of Electric Heating in Rural Off-gas Grid Properties - DELTA

domestic hot water needs. Significant investment in consumer education is needed to help them not only become more conscious and informed in making decisions, but also to motivate them to choose renewable heat technologies.

At the moment, the CHGS scheme only considers Heat Pumps and Biomass, with a clear bias towards ASHPs and restrictions placed around Biomass (as explored in earlier answers). The low level, flat rate grant risks incentivising poor quality or undersized ASHP systems. We believe that most systems will be installed in homes on, rather than off, the gas grid. There are other forms of low carbon heating excluded from the proposals that might also be suitable and even more accessible, including Solar Thermal and Micro CHP. To mitigate this, the grant amount and technologies need to be considered so that consumers aren't pushed towards cheaper, inferior products and installations.

The quarterly grant windows and capacity caps create "cliff edges" which lead to pressure selling. Reconsideration of the grant control mechanism needs to be undertaken to avoid several possibilities leading to mis-selling.

Low consumer awareness of renewable heating in relation to performance, electricity use and price will also lead to mis-selling. MCS is aware of cases where an installer will promote a range of different systems to a customer and the customer will settle for the lowest capacity option as it is cheapest. The installer may then later say that the heat loss calculations have changed, and a higher capacity system is now required, which in turn is more expensive. Similarly, an installer may provide an attractive initial quote and then cite supply chain problems, resulting in a more expensive product and a poor deal for the consumer. In both scenarios, if outside their cooling off period, the consumer is tied into a contract that will end up unexpectedly costing them more. This problem can be exacerbated by the fact that there aren't centrally published prices for the costs of a Heat Pump/Heat Pump models. Publication of these could help a consumer during their research as well as empowering them when comparing quotes.

Another mis-selling opportunity may arise from non-certified installers, in particular if grants are oversubscribed. An installer could build their sales pitch around grant availability and the promise of an attractive quote, with an inferior system and poor installation. The customer gets a cheap system rather than a certified, grant funded one. Consumer awareness raising is vital so that a consumer understands that they need to look for the MCS quality mark when investigating solutions.

The cost associated with servicing and maintaining a low-carbon energy system is a consumer protection risk. MCS is developing maintenance standards and more accessible insurance-backed warranties as well as a shift to a competency-based training model aligned with MCS standards to help Installers mitigate these risks.

In relation to the installation, there is a risk that the customer is quoted for an MCS certified product but an alternative, inferior product is installed. This can be monitored to a certain extent by new MCS audit regimes that are due to be introduced in 2021.

Alongside take-up of the scheme, we must ensure that consumers have a good understanding of energy efficiency and how this affects their energy bills. Consumers must begin to plan for the whole life cost of energy.

The voucher scheme also poses risks for both consumers and installers. MCS covers the consumer protection element in the answers provided to Q43 and Q44.

MCS as the industry's Standards and quality scheme has recently enhanced its approach in placing consumer protection at its heart. This has included the integration of consumer code membership via an innovative new partnership with the CTSI approved scheme RECC (Renewable Energy Consumer Code). This offers the sector a single compliance regime that is easier to understand and comply with.

MCS sees part of our role as empowering consumers to make an informed decision when researching and installing a low carbon heat solution. We will provide impartial information, calculators and other useful tools. This will be supported with clear, targeted communications and campaigns. Ultimately, we will promote the importance of employing an MCS certified installer that they can trust.

It should be noted that the MCS Charitable Foundation has commissioned a scoping study to review the information and advice available to consumers on renewable energy and energy efficiency in the home. This is due for publication early Autumn.

Q37. Do you agree that quarterly grant windows would prevent overspend and manage demand to ensure an even spread of deployment? Yes/No. Please provide evidence to support your response.

No.

Using lessons learnt from previous schemes, it would be better to link the grant to a clear and transparent degression mechanism which would respond to changes in the market to effectively manage available funding. There should be a process to ensure a voucher is used within a specified number of months of being issued. This is especially important given that the CHGS will only run for two years. Issues with vouchers not being spent could result in a proportion of the available funding being allocated but not used by the scheme closure. Data from RHPP (Appendix 2) in terms of claims paid highlights that a total of £18.9 million vouchers were claimed but only £14.1 million claims were paid – a gap of £4.8million unclaimed vouchers.

MCS has concerns with how a consumer would manage grant windows. If they were rejected from one grant window, for instance, what would happen with their application during the next grant window? The grant window application process would need to be designed around a single consumer and their property versus wholesale applications from owners of numerous properties.

There is also the potential of causing additional work for Installers who could suffer from delays in their sales pipeline with customers who are on hold, waiting for a grant window to open. This could result not only in sale losses for installers, but also risks disengaging consumers during their journey to adopt renewable technology.

Communicating grant windows and application processes to consumers is an added complexity in their process to install a low carbon heating system.

MCS is also concerned that easier to install systems are likely to secure and redeem vouchers more efficiently; for example, social landlords with a volume of properties could secure a

significant number of vouchers at the start of each quarterly grant window, reducing or removing access to single homeowners.

As we have stated previously, we would advocate ring-fenced funding for social landlords to avoid jeopardising single consumers and their installers. Consideration should also be given to ring-fencing some budget to support those consumers who may have a "distress purchase" need. They shouldn't be disadvantaged if their boiler fails and they want to switch to renewable heat, but are prevented from doing so if it falls within a grant window and the budget for that window has been fully allocated.

Q40. Do you agree with not supporting solar thermal systems under the Clean Heat Grant? Yes/No. Please provide evidence to support your response.

No. The government maintains a technology neutral approach yet Solar Thermal as a credible renewable heat technology has been excluded from CHGS proposals on several counts.

The potential of Solar Thermal to provide not only domestic hot water, but also sufficient space heating has been worryingly overlooked. BEIS do not appear to have accepted the Solar Thermal space heating calculations, which is likely why it is excluded from the DRHI. Since Solar Thermal is now included in SAP, this should be reviewed and considered for inclusion in the CHGS. Generally, Solar Thermal installations used for space heating are a popular choice, according to our data.

There is a misconception that high levels of irradiation are required to support Solar Thermal as a form of low carbon heating in the UK. However, the levels of solar irradiation in the UK and Scotland are comparable to those of Germany, where it is already well established as a means of heating[7]. Solar Thermal is able to provide heat directly which is more efficient than converting electrical energy into heat; even on cloudy days will still work as it is not reliant on direct sunlight. Solar Thermal, more than others, is a technology that can be considered 'climate change adapted.

Another consideration is the potential of Solar Thermal in hybrid (pairing renewable technologies) installations. It is complementary to Heat Pump and Biomass installations. One concept gathering interest in the market is solar collectors feeding a thermal store that a Heat Pump collects. MCS would be supportive of exploring this with BEIS to promote innovation. If these technology pairings were considered in the consultation, there could be a way of upselling Solar Thermal, provided there are no penalties. The integration of Solar Thermal can improve a system's efficiency and reduce running costs.

With 'hard to treat' properties, hybrid systems including Solar Thermal and another renewable heat technology type combination can be effective. As fabric tightness improves in small dwellings, Solar Thermal can increasingly be used for space heating. Traditionally, space heating accounts for 75% of heat demand, compared to 25% domestic hot water, however as fabric tightness improves, the margins get closer to 50% for each. In this scenario, Solar Thermal can provide 60% of hot water energy and up to 25% of space heating resulting in an energy saving of 45%.

[7] SISER – solar in Scotland

Solar Thermal can provide a viable alternative and has lower capital costs. This makes it more attractive to lower-income households who cannot afford the extra costs associated with other technology types. We acknowledge that it is a cheaper technology to install, however if a proportional grant is introduced it would allow for the inclusion of Solar Thermal. A possible idea could be that if a customer purchases a Heat Pump with the grant, the customer could receive an additional £1,000 grant if they add a Solar Thermal installation. This would promote hybrid systems with a performance grant addition. The data in Appendix 5, chart 7 demonstrates that with support, there is potential for the capital costs of Solar Thermal to be reduced if installations increase. A double in deployment rates would result in a 10% decrease in costs.

A UK study from 2014 indicated that if Solar Thermal were to be deployed on a larger scale of around five million installations it could save on global warming potentially by 9%. Also, when compared with different types of Heat Pumps they were more sustainable on seven out of eleven measures of impact, including fossil fuel depletion and global warming[8]. A 2019 market report from Solar Thermal Europe found that Solar Thermal heating is competitive on price in a diverse range of scenarios. It is being used to heat domestic hot water in Greece at 2€-cents per kWh compared to a larger scale solar district heat network in Denmark where it costs below 3.5€-cents per kWh. Thermosiphon systems are widely used in other countries, which can reduce the cost of a solar thermal system by up to 50% compared with the average cost of £4,500.

The Energy Saving Trust Solar Thermal field trial provided evidence of up to a 60% contribution to hot water i.e. 60% carbon reduction versus a fossil fuel system[9].

Given the flexibility in the way that Solar Thermal can be deployed and at relatively low cost when compared to other low-carbon technologies, we believe this strengthens the case for its inclusion under the CHGS[10].
While the Solar Thermal landscape is becoming more positive, it needs financial support and awareness raising amongst consumers to encourage take-up. We wouldn't want the symbolism of BEIS not supporting Solar Thermal to be damaging to the market, nor to stifle potential innovation.

Q41. Do you agree with not supporting hybrid systems under the Clean Heat Grant? Yes/No. Please provide evidence to support your response.

Yes. But this is only within the context of the definition within the consultation. The BEIS definition of a hybrid system under the CHGS appears to be a combination of a Heat Pump and fossil fuel boiler, with most systems using an ASHP hybrid.

As hybrid systems are currently supported by the DRHI with the requirement that the renewable technology element is metered for payment, MCS believes hybrids may have a modest role to play for the two years the CHGS will provide funding, rather than beyond that.

[8] Domestic solar thermal water heating: A sustainable option for the UK - Benjamin Greening and Adisa Azapagic, University of Manchester
[9] EST Field Trial
[10] Solar Thermal Europe, Heat Market Report 2018

There are a lot of systems classed as 'hybrid', in which a gas fired boiler is used for domestic hot water while a Heat Pump provides heating for a property. As a result, this combination wouldn't make a considerable difference to carbon intensity. A true hybrid system would consist of a Heat Pump and an additional renewable technology to carry out space heating if required, but with the ideal of a Heat Pump providing both all of the space heating and all of the domestic hot water.

Properties with limited power capacity electrically could require a hybrid system, so the consultation may be excluding them, which is a concern.

MCS is supportive of hybrid systems that effectively combine renewable energy technologies such as a Heat Pump and Solar Thermal. In this scenario, we would like to see an additional but lower value grant awarded for the lower cost technology. In this case, Solar Thermal could attract a further £1,000 grant on top of the grant awarded for the Heat Pump installation.

BEIS should consider refinement of definitions to make a clear distinction between a hybrid system as a renewable technology coupled with a fossil fuel versus a hybrid system as a combination of renewable technologies in a property.

Q43. What are the main risks of non-compliance, fraud or gaming associated with the Clean Heat Grant?

MCS believes that the greatest risk of non-compliance under the Clean Heat Grant would arise if compliance to MCS standards was not incorporated as a requirement for installers and their products as part of a renewable energy solution that attracts a grant. MCS is the only Standard recognised by the UK Accreditation Service (UKAS) applicable to small-scale renewables, covering products and installers. As such, UKAS recognition affords third party, impartial certification decisions via Certification Bodies.

MCS is changing under new leadership and with a new directly employed operational team committed to ensuring compliance under the Scheme. See answer to Q44 for details of these plans.

Fraud could arise from vouchers being redeemed against non-existent installations, with both the installer and consumer complicit in such fraud. Furthermore, fraud could be perpetrated by individuals presenting themselves as both consumer and installer in an attempt to 'cash in' vouchers against installations that either do not exist or do not comply with Clean Heat Grant conditions. Time-sensitive vouchers which MCS would advocate, could also motivate some individuals to claim an installation is complete before it is. The inclusion of an MCS certificate to qualify a compliant installation that can attract a grant, affords a mechanism to track certified installations completed on or close to a voucher's expiry date. This intelligence can focus scheme compliance activities such as site visits to check on the status of an installation.

MCS has a further concern that a grant-based scheme could attract high pressure selling from sales lead generation organisations who would target consumers to apply for a grant, creating a market for successful grant applicant details to be 'sold' on to installers. This could devalue both the reputation of the government grant and its value in real terms, as installers paying a fee for sales leads could pass these costs on to the end customer.

Under MCS, a certified installer needs to prove they are legitimate through passing certification and Consumer Code compliance checks. An installer's operations are validated via an annual surveillance audit under the Scheme. MCS suggests that its compliance regime is critical to the success of the CHGS to avoid the involvement of rogue or phantom traders who would fail the MCS certification process and therefore would not be able to access vouchers. Although not a 100% guarantee, the MCS Scheme holds a business and nominated individuals accountable for the installations they register against the MCS Standard and, as a result, under the proposed grant system.

The MID is an invaluable source of installation-based information that can be shared with BEIS and is already accessible to Ofgem. Current MID data under DRHI, linked to census data for example, has the potential to provide market intelligence about installations that attract a Clean Heat Grant. This intelligence about an MCS installation includes, but is not limited to, the equipment that has been installed, who installed it, its capacity, the total cost of installation, insurance cover taken, property type and the demographic profile of the end consumer. MCS is committed to making this information available to BEIS officials via a regular report or dashboard during the lifetime of the proposed CHGS.

MCS proposes a fully integrated consumer satisfaction survey that can help identify compliance, fraud and gaming issues under the CHGS. This will involve using the MID linked to the Clean Heat Grant's voucher management system, hosted by MCS on behalf of BEIS or sitting within Ofgem, to enable an automated satisfaction survey to each voucher recipient aligned to an associated MCS certified installation. MCS is committed to following up with those customers of installers who attract the highest proportion of vouchers redeemed against their installations. This risk-based approach will help identify any significant non-compliance with MCS Standards and fraud / gaming of the voucher scheme. In addition, MCS is proposing a new inspections regime from 2021 onwards that would work in tandem with BEIS and Ofgem officials, using satisfaction survey data to help target site inspections where issues of fraud or gaming are suspected. These inspections will be in addition to the standard annual audits performed on behalf of MCS by Certification Bodies.

Q44. What would be the most important features of an audit regime to minimise the risk of non-compliance?

MCS plans for its Scheme in 2021 are intended to best support the final year of the DRHI and the CHGS from its inception. The 'new MCS' will consist of the following comprehensive audit regime relevant to the Clean Heat Grant:

- A simpler and more accessible set of MCS Standards documents, including the associated guidance, tools and calculators. This work is ongoing, with the core installation Standard MCS001 reissued in July 2020. A significant update to MIS 3005, the MCS Heat Pump Installation Standard, is now in development. MIS 3005 will be split into two simple documents; one for design and one for installation.
- To ensure that MCS documents are as accessible as possible and in turn will drive up standards of workmanship, MCS documents will be readily available and relevant to an installer's everyday activities. A new digital platform (mobile app and website) will be launched in 2021 that will enable MCS certified installers to access MCS Standards via checklists, online guides and calculators as part of their everyday onsite installation

activities. This approach evolves from a static set of documents with compliance assessed on an annual basis via a Certification Body's audit. In this way, compliance to MCS is being repositioned as fundamental to the delivery of a customer's renewable heating and hot water solutions.

- MCS will be resetting the certification scheme associated with its Standards which will require a different relationship between MCS and its third-party Certification Bodies. Early in 2021 a new MCS certification framework will be launched. The intention is to create a truly risk-based compliance audit regime that moves beyond a 'one-size fits all' approach. Audits will focus on collecting evidence of an installer's technical ability via site visits. Furthermore, and as a way of focusing audit resources, the new framework will reward an installer's continued compliance with a relaxation of audit demands and/or audit frequency. This will ensure the resources necessary to target installers who represent the greatest compliance risk, based on the volume of their installations, complexity of their operations including subcontracting and/or their profile of customer complaints.
- A fully integrated Consumer Code (RECC) as part of the MCS proposition, ensuring consumer protection, is fundamental to the Scheme's compliance and assessment activities. This approach will further simplify the Scheme and improve its accessibility for consumers and installers.
- A new responsive inspections resource managed directly by MCS and not via third party certification bodies that is able to respond to complaints and issues as they arise. This capability will work closely with BEIS and Ofgem colleagues, responding to issues flagged to them, and offering responsive on-site inspections.
- An integrated insurance-backed, minimum two-year workmanship warranty proposition, offered to installers at the point of registration of a job with MCS. This process will be seamless, incorporating a new value for money insurance product. As it will be more cost effective to the installer, it is therefore more likely to be adopted than the current arrangement through which the installer has to secure their own insurance provider separately to registering an MCS installation. The new proposition operated via the MID, will automatically record the insurance details alongside the MCS certificate. This will help identify potential gaps in insurance cover and also better support the consumer if they have need to call on their insurance backed warranty.

As has been described above, MCS is changing. Developing beyond the support already provided to DRHI, MCS offers the necessary quality assurance that can underpin consumer confidence vital for the investment in clean heat solutions that will bolster the reputation and effectiveness of the proposed CHGS.

45.Does your interest in this consultation relate to a particular geographical area? (select all that apply)

England: Yes

Wales: Yes

Scotland: Yes

Appendix 2

Task Force Membership

MCS would like to acknowledge the contributions of the Task Force and their wider stakeholder community in formulating this response. Established in mid-May, the Task Force met regularly over six weeks to focus on addressing particular areas of the consultation.

Special thanks to:

- Bruce Allen
  CEO, HETAS and Woodsure with sector specialism(s) in Biomass installation, servicing and maintenance; certification schemes
- Nick Cater
  Owner, Birds' Hill with sector specialism(s) in Log, Wood Pellet, Air Source Heat Pump, Ground Source Heat Pump and Solar Thermal heating systems.
- Grant Feasey
  Senior Design Engineer - Chartered Engineer, AES Solar with sector specialism in Solar Thermal
- Dr Richard Hall
  Vice Chair, IEA Solar Heating and Cooling TCP & Chair, Solar Trade Association Solar Heat Working Group with sector specialism in Solar Governance.
- Dr John Holden FIET
  Chair of MCS Heat Pump working group with sector specialism(s) in assurance, standards, certification, heat pump testing and performance.
- Andrew Hopton IEng, MIET, MCIPHE
  Director of Woodsure & Head of Quality & Certification for HETAS with sector specialism(s) in ISO17065 accredited certification schemes, including CPS and MCS Biomass product and installer and member of various BSI committees for biomass fuel, solid fuel installations, chimney and appliance standards.
- Dan Large
  Director of Solaris Energy Ltd and member of the MCS Heat Pump Working Group with sector specialism(s) in domestic & commercial Heat Pump design, installation and maintenance.
- Paul Leedham
  Managing Director of Matrix Energy Systems with sector specialism(s) in Heat Pump design, installation, maintenance and training as well as Solar Thermal, Solar PV and Micro CHP.
- Graham Lock
  Founder/Director of Low Carbon Homes with sector specialism(s) in Local Authority, community and industry domestic property retrofit engagement.
- John Thomason
  Director of Atmos Innovations Ltd as well as Member (and director) of the Solar Trade Association and Solar Thermal working group member with sector specialism in Solar Thermal, with some experience of hybrid systems where Solar Thermal is used alongside other technologies.
- Sune Nightingale

Director at Firepower & Stovesonline as well as HETAS Technical Committee & Installation sub-committee member and BSI RHE/28 committee member with sector specialism(s) in domestic Biomass, thermal storage, MVHR systems with integrated heat pumps.

Thanks are also extended to Renaldi Renaldi, a Research Associate from University of Oxford for supporting our optimal subsidy study.

Appendix 3

MCS wishes to share its learning from the support provided to previous government incentive schemes. This is summarised below together with a chart referred to throughout this section that shows the impact of various schemes on installation volumes. The schemes referred to here are Clear Skies, RHPP and DRHI, all of which were designed to incentivise the uptake of low carbon heating systems.

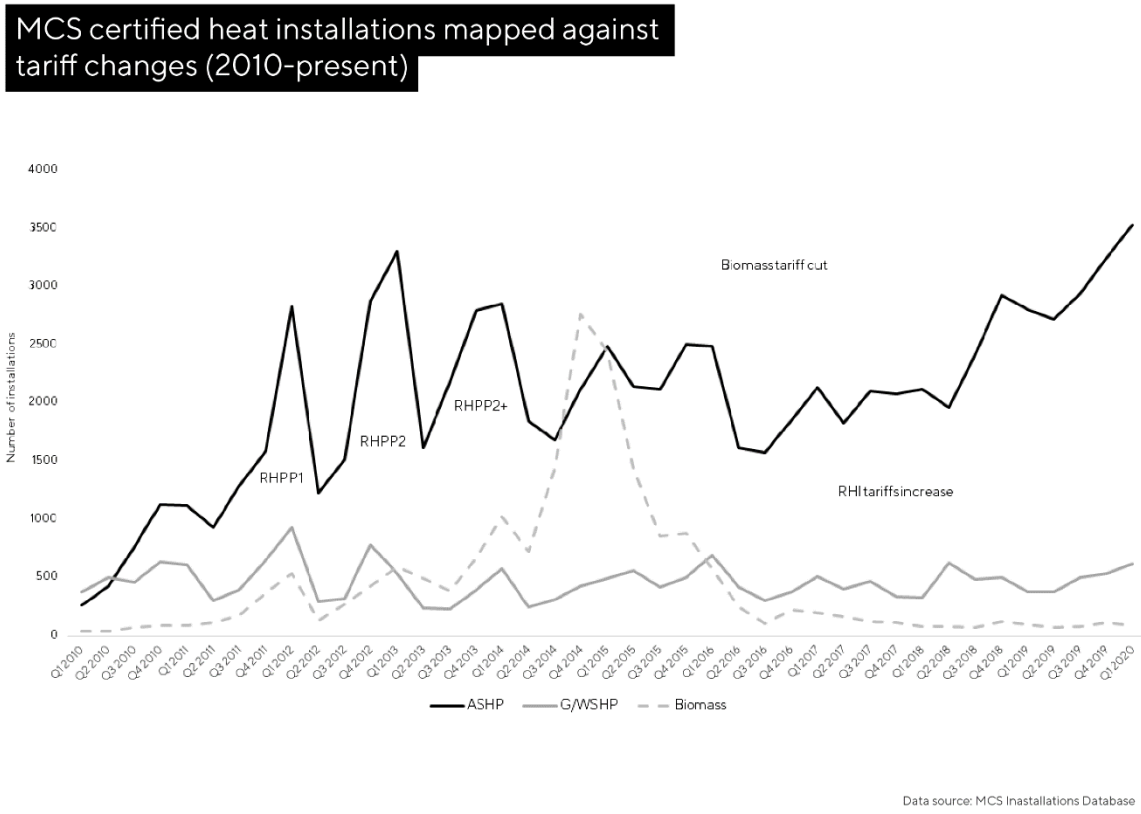


CHART 3: MCS CERTIFIED HEAT INSTALLATIONS MAPPED AGAINST TARIFF CHANGES

Key learnings:

- **Standards are critical** to determining the quality and consumer protection framework associated with a government scheme. MCS is able to work hand in hand with regulatory compliance.
- **Degression mechanisms can help smooth available funding** with all schemes having driven an initial spike in demand upon launch and subsequently running up to an announced forthcoming grant or tariff reduction, or following an increase in an available incentive.
- **Incentives can work but need to be proportionate** to the capital and installation cost of a given technology or they risk skewing market behaviour towards the adoption of the lowest cost solution versus the most appropriate solution; appropriate in terms of maximising carbon savings and to meeting the energy needs of an individual building.
- **The value of incentive is important;** if set too low, the market will not respond, or if set too high, it creates a draw for new operators to enter the market purely to take

advantage of the funding versus motivation to deliver quality installations for consumers.
- **Incentives need to be targeted** as on their own, without an associated holistic package of support, they typically only benefit those in society who were able to finance their installations anyway.

The Clear Skies Initiative

Between 2004 and 2007, the former Department of Trade and Industry launched the Clear Skies Initiative which provided a total of £13 million grant funding (non-means-tested) to homeowners. The eligible technologies for these proportional grants were:

- Solar Thermal (£400 grant)
- Ground Source Heat Pumps (£1,200 grant)
- Biomass Boilers (£1,500 grant) and
- Pellet Stoves (£600 grant).

The grant was proportional to capital cost, which was considered more favourable than a flat-rate approach, with the value of the funding varying based on installation costs. Air Source Heat Pumps were not eligible at the time because of concerns around product efficiency. The grant was paid directly to the consumer who would select an installer, complete an application, and submit a claim with evidence.

Clear Skies was a self-certification scheme, not a third-party certification scheme, and this approach led to the creation of the Microgeneration Certification Scheme (MCS) standards for the avoidance of poor workmanship and consumer detriment.

Renewable Heat Premium Payment Scheme (RHPP)

The Renewable Heat Premium Payment (RHPP) scheme provided one-off grants to help householders and landlords with the cost of installing renewable heat technologies. RHPP launched in August 2011 and closed on 31 March 2014. RHPP was delivered in phases with a lower level of the grant being offered to householders before 20 May 2013 and the grant level almost doubling after this date. It was replaced by the DRHI on 9 April 2014.

The eligible technologies for these grants were:
- Ground and Water Source Heat Pumps (G/WSHPs)
- Air Source Heat Pumps (ASHPs)
- Solid Biomass Boilers and
- Solar Thermal systems.

During the lifetime of the RHPP, financial support was given through a Householder Scheme and was administered by the Energy Saving Trust, with around £18.9 million in vouchers issued. There were separate competitions for registered social landlords, and a community scheme.

MCS analysis shows the increase in grant resulted in a spike in installations, followed by a significant drop-off during the different phases of the RHPP. This can be seen in the previous chart, equating to changes in the value of the grant as detailed below.

Technology	Grant value before 20 May 2013	Grant value after 20 May 2013
G/WSHPs	£1,250	£2,300
ASHPs	£850	£1,300
Solid Biomass boiler	£950	£2,000
Solar Thermal systems	£300	£600

Source: RHPP, UK Government Analysis

RHPP claims paid for the householder scheme:

	Financial Year	Vouchers issued (£million)	Claims paid (£million)
Phase 1	2011/12	£5.5	£4.0
Phase 2	2012/13	£5.2	£3.8
Phase 2 extension	2013/14	£8.3	£6.3
Total		**£18.9**	**£14.1**

Note: Individual values do not add up to the total due to rounding

Source: RHPP, UK Government Analysis

Domestic Renewable Heat Incentive (DRHI)

The DRHI launched in 2014 to replace the RHPP. To date the total number of accredited installations under the scheme is 78,791 of which 1,540 have also installed the Metering and Monitoring Service Package (MMSP) which helps households monitor their heat consumption. The total amount of payments across all tariffs under DRHI to May 2020 was £539.1million.

DRHI uses a degression mechanism[11], and we can see in the previous chart the impact this mechanism can have on installation volumes, with the Biomass tariff starting at 14.05p/kWh for the period April - December 2014, to eventually being reduced significantly to 5.05p/kWh in 2017. This change in tariff resulted in Biomass installation registrations peaking at 5,952 in 2014 and then decreasing by around 90% to 591 during 2017.

Further modifications to the DRHI scheme saw an increase in the Air Source Heat Pump tariff in 2018, after which the chart highlights an upward trend more recently, with an increase in ASHP installations. Approximately 59,000 heat pumps have been installed under the scheme already. If a similar level of deployment were to continue, around 75,000 heat pumps can be expected by the scheme closure date[12].

[11] DRHI Factsheet, Degression Mechanism BEIS

[12] Heat: a policy chasm on the route towards net-zero

Appendix 4

International Policies

As part of our response formulation, MCS has reviewed best practice of renewable heat policy at an international level and would urge government to consider renewable heat policy and lessons learnt internationally.

Scotland

Scotland has a strong, joined up policy approach; its holistic view provides several important drivers for the market, clearly allowing renewable energy to thrive.

The current Home Energy Scotland programme should be used as a model UK-wide to improve energy efficiency in homes and buildings[13]. Under this programme, property owners can access impartial advice and it acts as a gateway to accessing an interest-free loan of up to £17,500 to install a renewable system[14].

France

Looking to France we see that market penetration of heat pumps is much greater.

In 2017 alone 254,000 heat pumps were sold versus 22,000 in the UK[15].
Much of this difference can be attributed to how the French government's policy takes a whole-house approach to energy efficiency, including fabrication and installation of low carbon heating systems. A national energy advice service helps consumers access appropriate packages of support through a mix of subsidy, tax relief and loans[16].

From January 2020, the lowest income households in France can access at least €10,000 in means-tested support for a G/WSHP and middle-income households around €4,000. ASHPs attract a lower rate of subsidy overall with the lowest income households able to access €4,000 and middle-income households €2,000.

Support for Solar Thermal and Biomass is also available, attracting a comparable and proportional level of subsidy. This means-tested support can be combined with a non-means tested 0% loan and attracts a reduced rate of VAT (5.5%).

There are also regional variations and lower-income households can often get further local support on top of these nationally funded initiatives.

The table shows a snapshot of the types of support offered in France to stimulate the domestic renewables and energy efficiency sector:

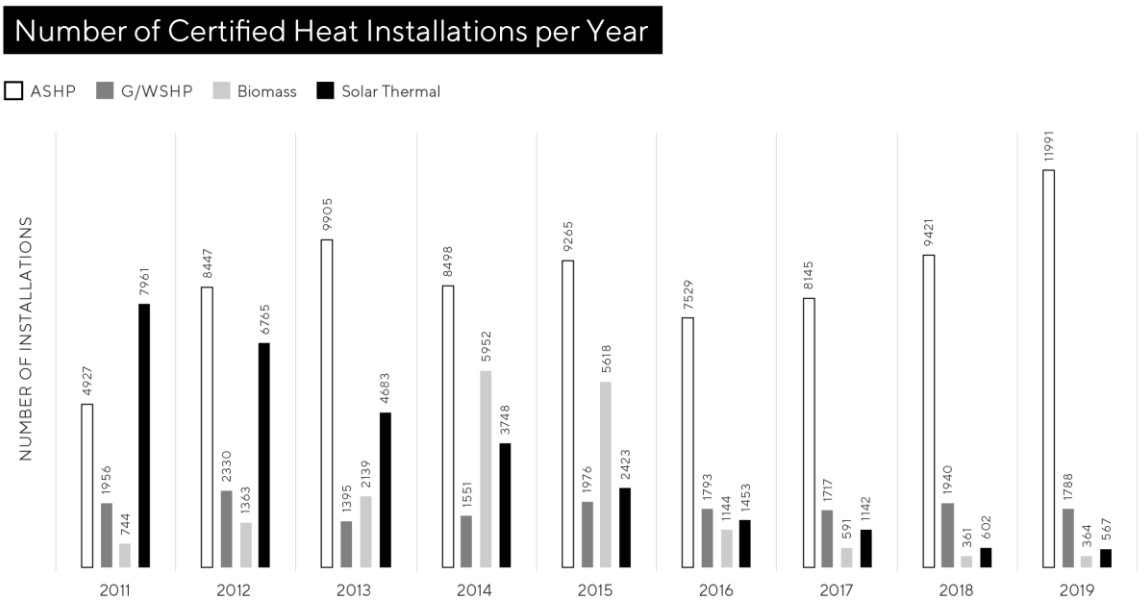
[13] EST, Home Energy Scotland Programmes
[14] EST, Home Energy Scotland Loan
[15] European Heat Pump Association, Market Data 2017
[16] Le portail de l'Économie, des Finances, de l'Action et des Comptes publics

Policy Measure	Eligibility Criteria	How is advice/support accessed by consumer?	Further Information
Energy Transition Tax Credit/'Crédit d'impôt pour la transition énergétique' (CITE)	Means-tested for homeowners to improve energy efficiency in their primary residence.	'Faciliter, Accompagner et Informer pour la Rénovation Énergétique' (FAIRE) is the national advice service	From January 2020, CITE and MaPrimeRenov are merged
'MaPrimeRenov' bonus scheme	Calculated on two factors: 1. the income of the household 2. the energy savings made possible by installation of low carbon heating + energy efficiency measures	Accessed through FAIRE	Support for households is targeted at lower-income households <€38,210 per year as of 2020 Further subsidies are often available for lower-income households at a local level – but subject to regional variation
Reduced VAT (5.5%) on energy saving and improvements works	Non-means tested	The registered professional performing the work provides a certificate for the property owner to sign. The certificate confirms improvements have been in made in line with the Regulations	Reduced rate of VAT is only available on the labour and material of work carried out by the registered professional. Certificate must be retained by both parties for inspection by tax authorities.
A 0% eco-loan (éco-PTZ)	Non-means tested	Accessed through FAIRE	• Borrow up to €30,000 – repaid over 10-15 years • Aimed at owners and landlords to finance extensive retrofit energy efficiency measures on their properties. • Applicants must implement at least two measures to achieve a certain level of energy efficiency. • Covers all works, required including management of the project and any insurance costs. • Can be combined with the other support to create a finance package

Sources: Renewable Energy Policy, France - Sres and FAIRE

Appendix 5

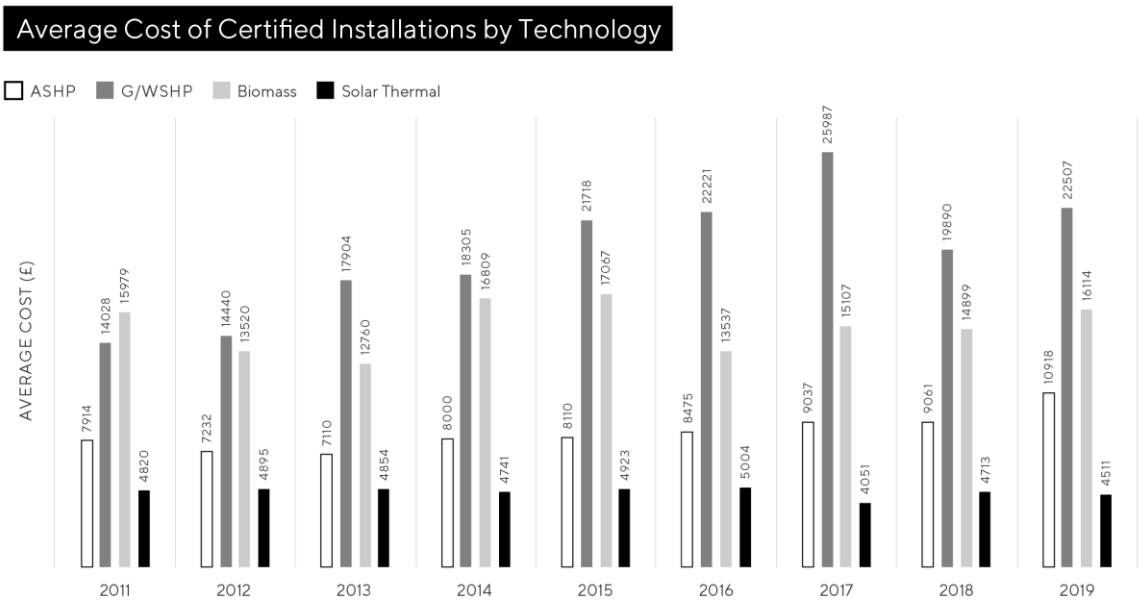
Data Pack



	YEAR								
TECH TYPE	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
ASHP	4927	8447	9905	8498	9265	7529	8145	9421	11991
G/WSHP	1956	2330	1395	1551	1976	1793	1717	1940	1788
Biomass	744	1363	2139	5952	5618	1144	591	361	364
Solar Thermal	7961	6765	4683	3748	2423	1453	1142	602	567

Data source: MCS Installations Database

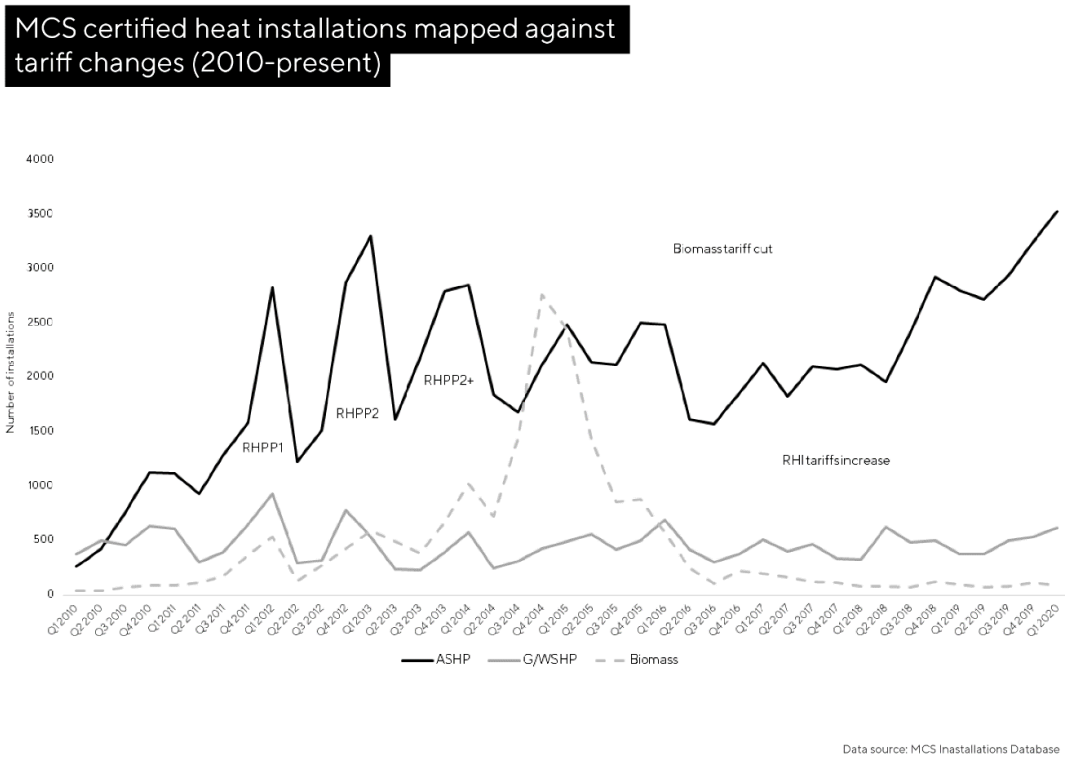
CHART 1: NUMBER OF CERTIFIED HEAT INSTALLATIONS PER YEAR



Avg. cost in £	YEAR								
TECH TYPE	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
ASHP	7914	7232	7110	8000	8110	8475	9037	9061	10918
G/WSHP	14028	14440	17904	18305	21718	22221	25987	19890	22507
Biomass	15979	13520	12760	16809	17067	13537	15107	14899	16114
Solar Thermal	4820	4895	4854	4741	4923	5004	4051	4713	4511

Data source: MCS Inastallations Database

CHART 2: AVERAGE COST OF CERTIFIED INSTALLATIONS BY TECHNOLOGY



Data source: MCS Inastallations Database

CHART 3: MCS CERTIFIED HEAT INSTALLATIONS MAPPED AGAINST TARIFF CHANGES

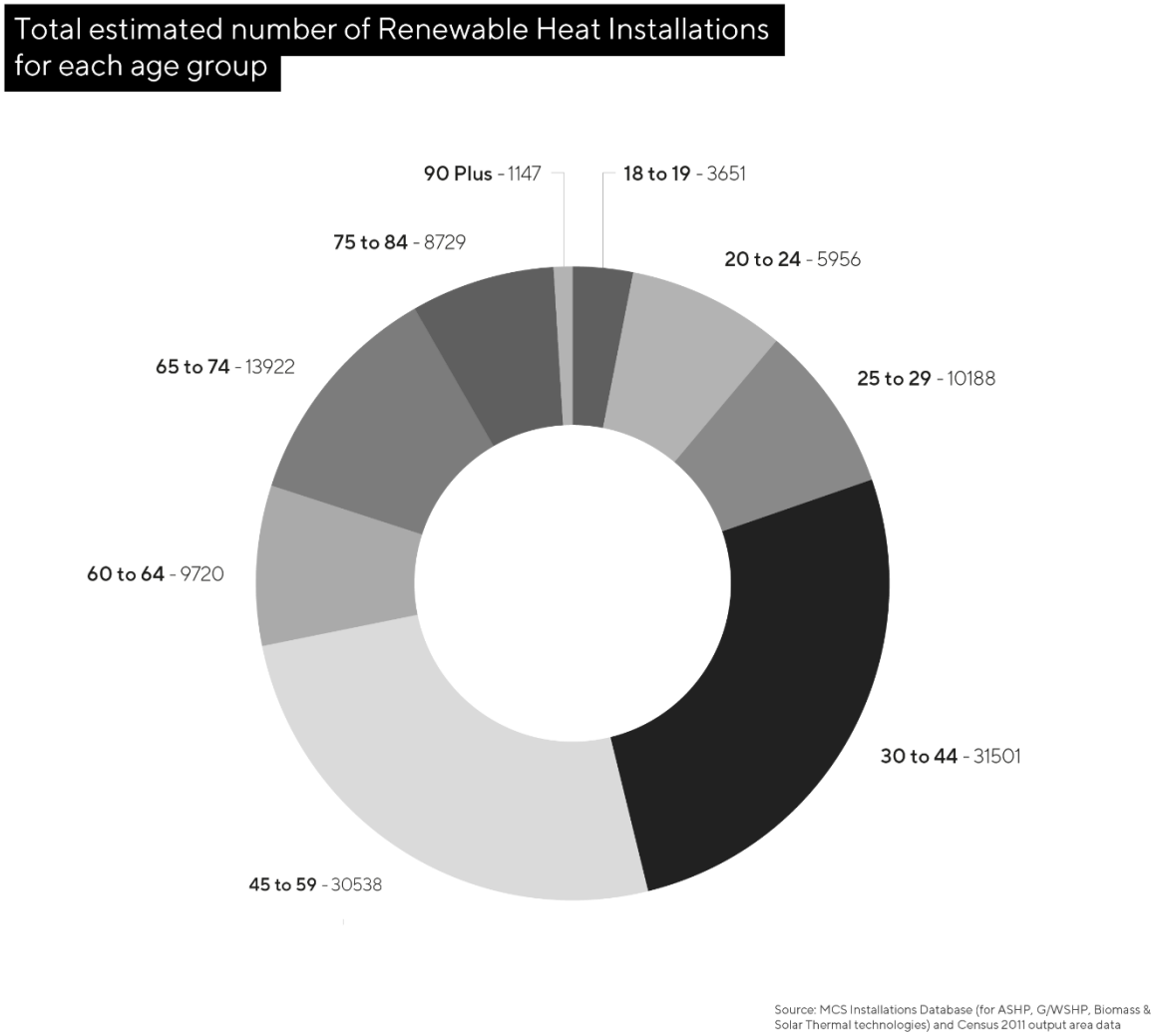


CHART 4: TOTAL ESTIMATED NUMBER OF RENEWABLE HEAT INSTALLATIONS FOR EACH AGE GROUP

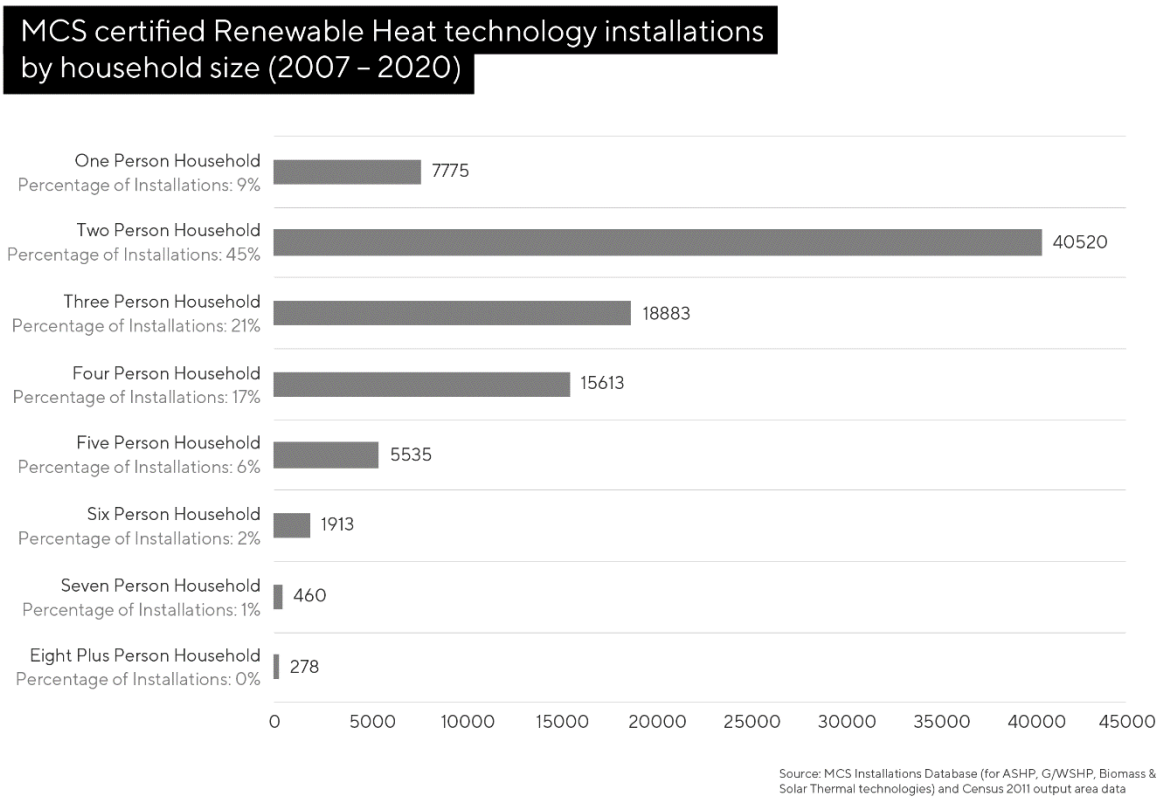


CHART 5: MCS CERTIFIED RENEWABLE HEAT TECHNOLOGY INSTALLATIONS BY HOUSEHOLD SIZE (2007 – 2020)

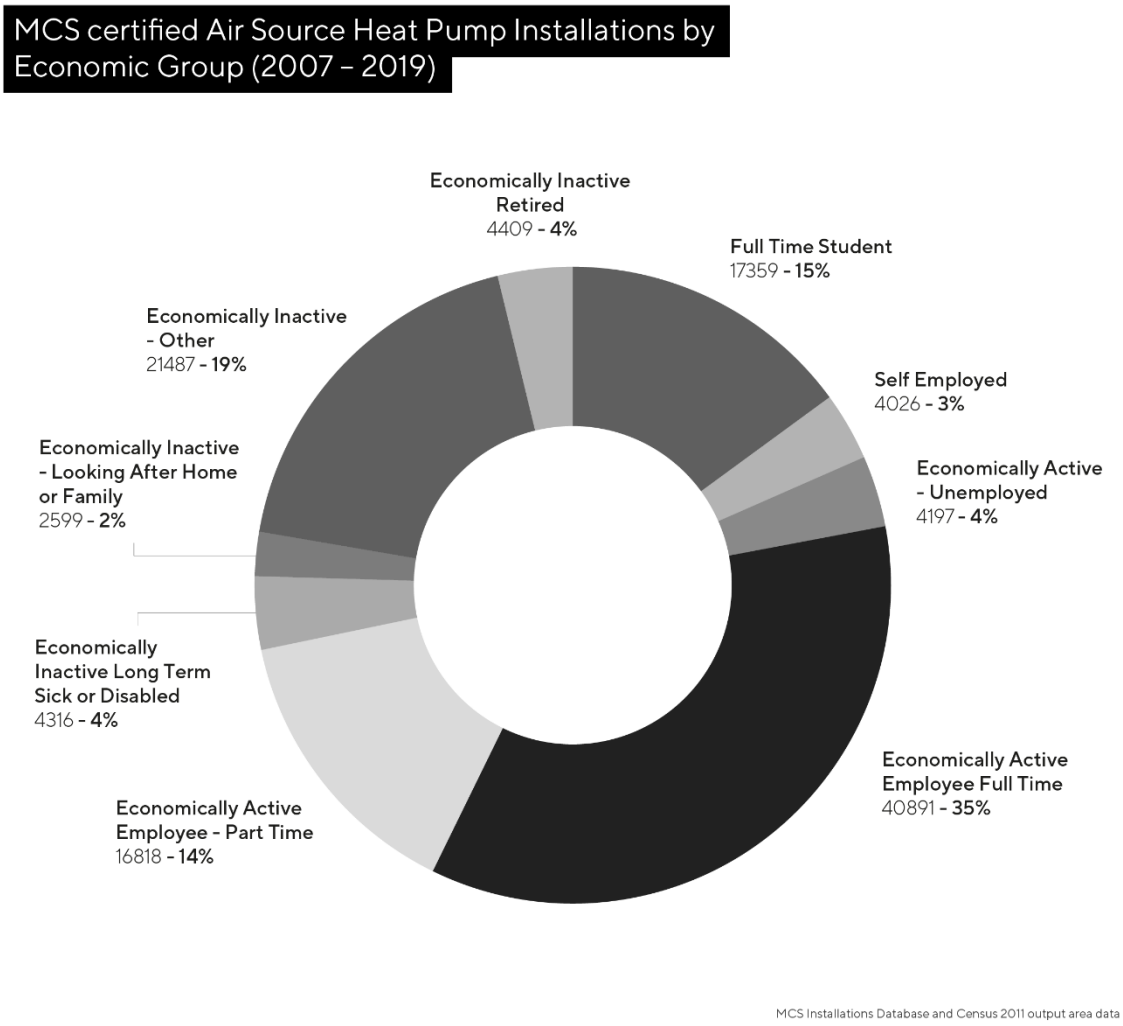


CHART 6a: MCS CERTIFIED AIR SOURCE HEAT PUMP INSTALLATIONS BY ECONOMIC GROUP (2007 – 2019)

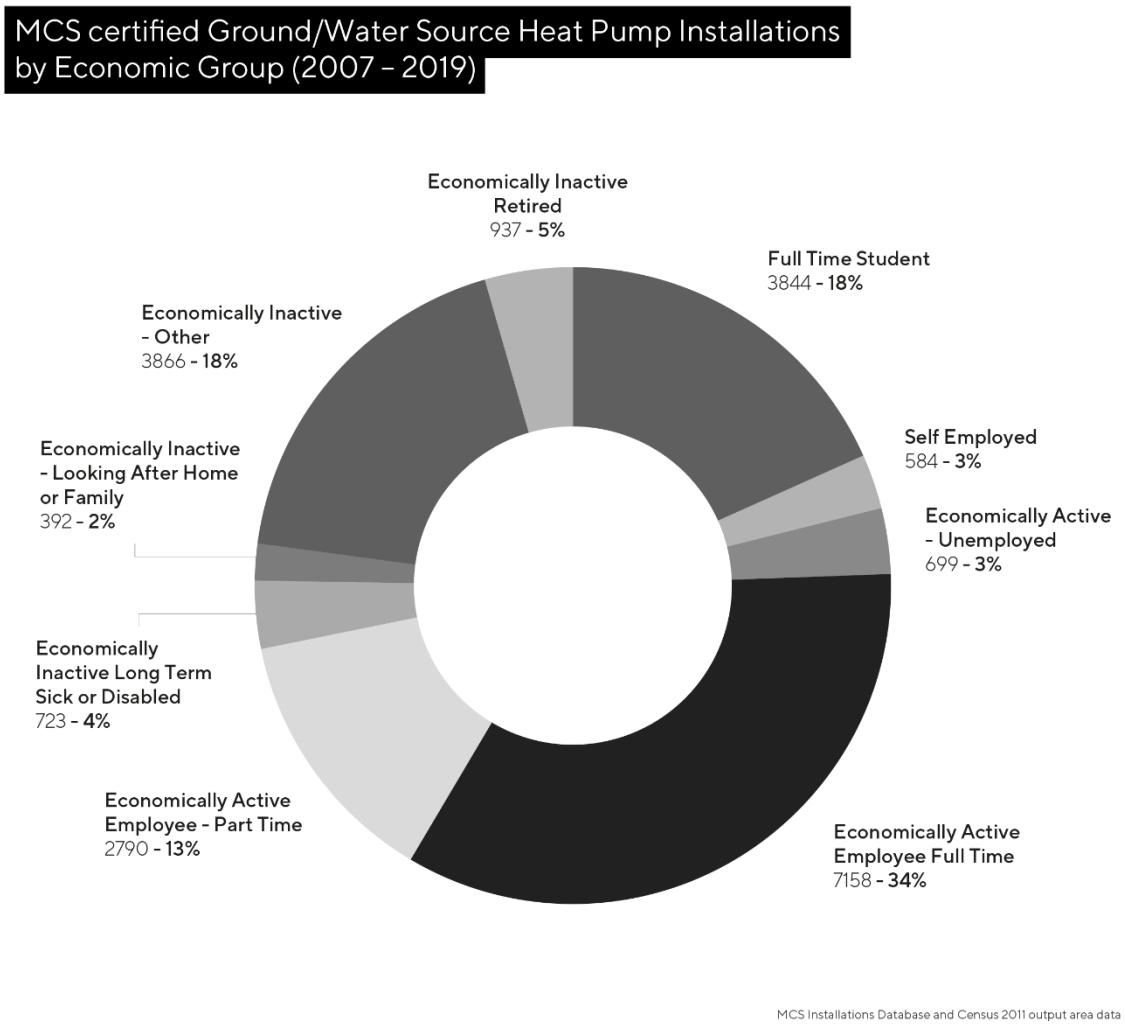


CHART 6b: MCS CERTIFIED GROUND/WATER SOURCE HEAT PUMP INSTALLATIONS BY ECONOMIC GROUP (2007 – 2019)

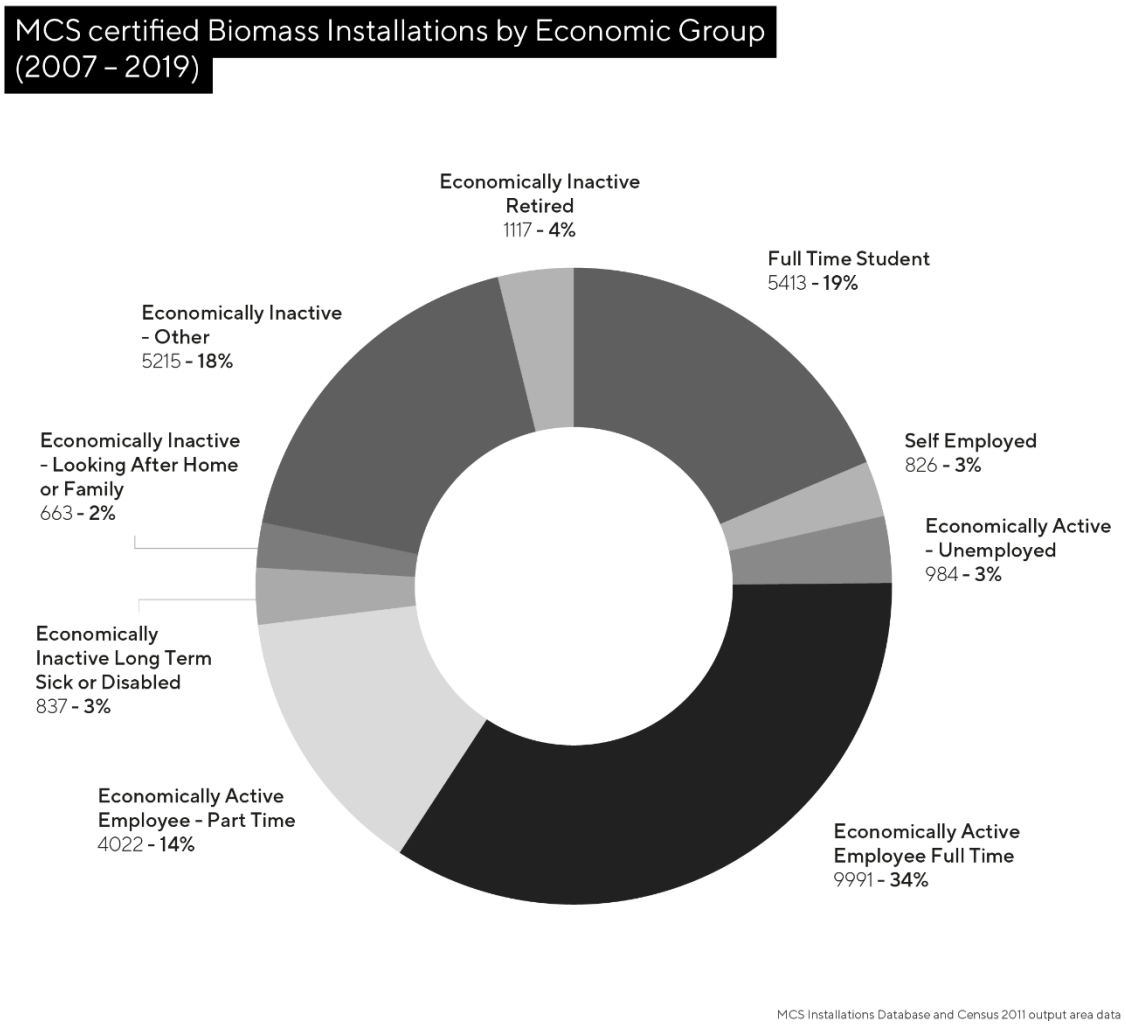


CHART 6c: MCS CERTIFIED BIOMASS INSTALLATIONS BY ECONOMIC GROUP (2007 – 2019)

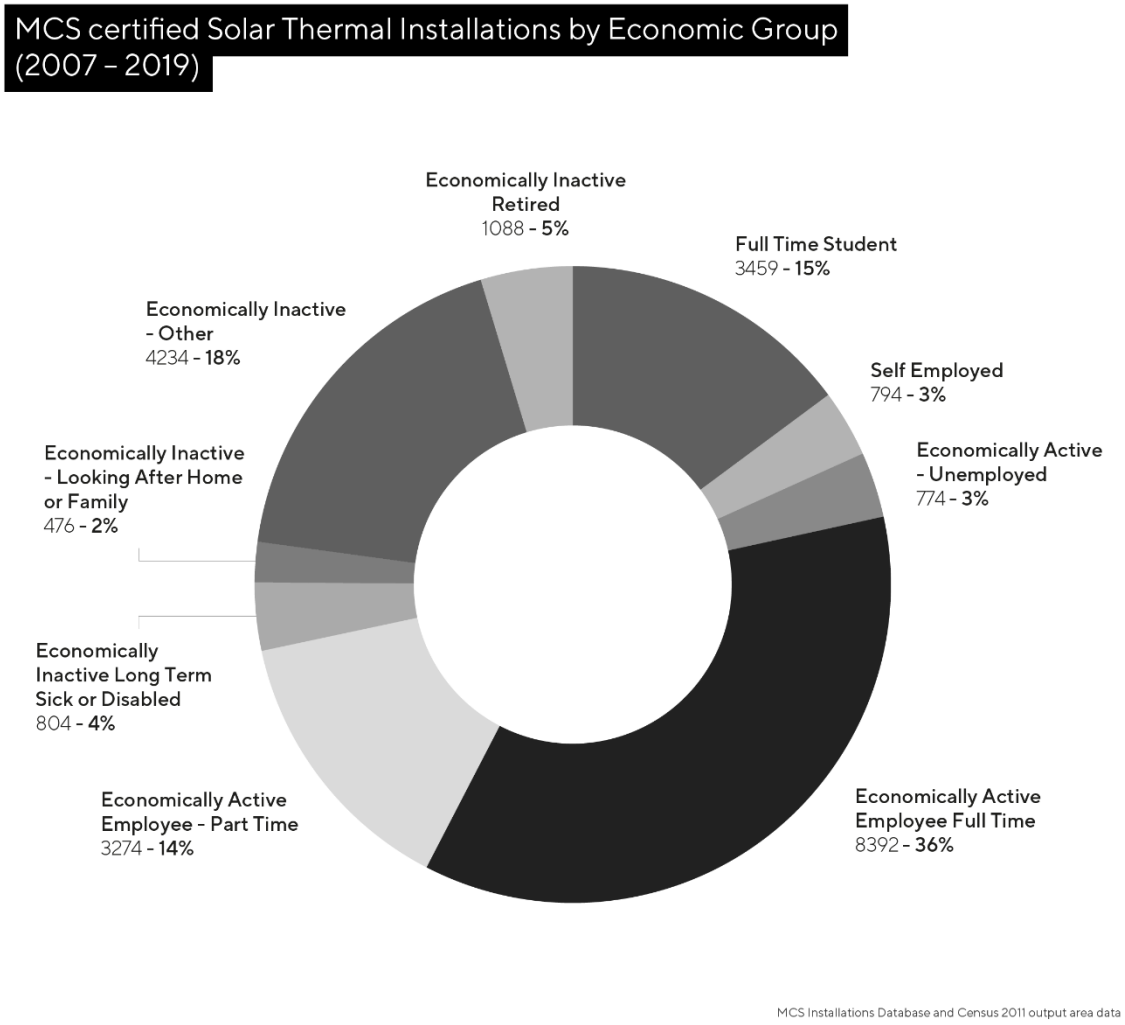


CHART 6d: MCS CERTIFIED SOLAR THERMAL INSTALLATIONS BY ECONOMIC GROUP (2007 – 2019)

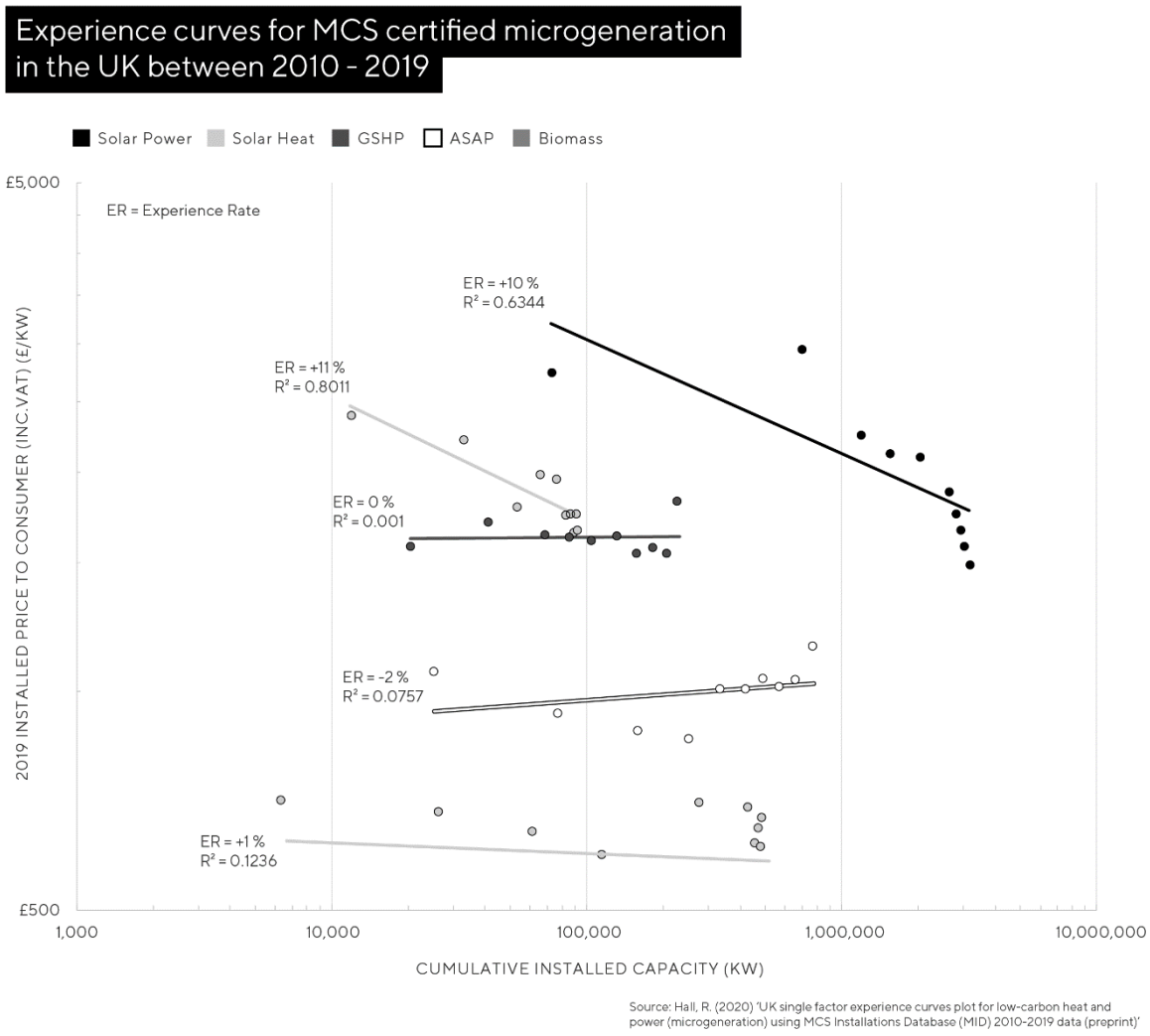


CHART 7: EXPERIENCE CURVES FOR MCS CERTIFIED MICROGENERATION IN THE UK 2010 – 2019

Appendix 6

Heat Pump Installation Cost Modelling (Supply and Install)

These cost demonstrations have been independently produced and verified by MCS certified Installers. They give an indication of the actual costs of Air Source Heat Pump and Ground Source Heat Pumps in a selection of dwelling types.

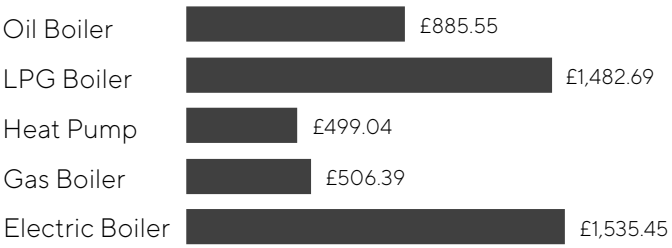
EXAMPLE DWELLING 1

A three-bedroom semi-detached new build house (120m2)

Air Source Heat Pump: £8,690.23

Potential Carbon Saving: 74.04%

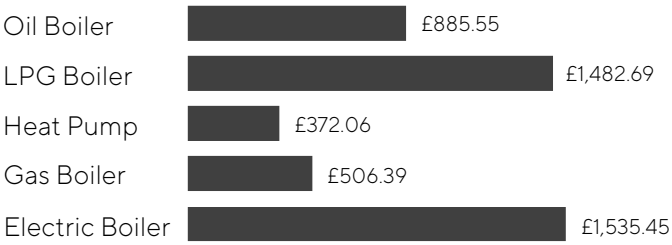
Annual fuel consumption cost comparison:



Ground Source Heat Pump: £25,680.84

Potential Carbon Saving: 78.49%

Annual fuel consumption cost comparison:



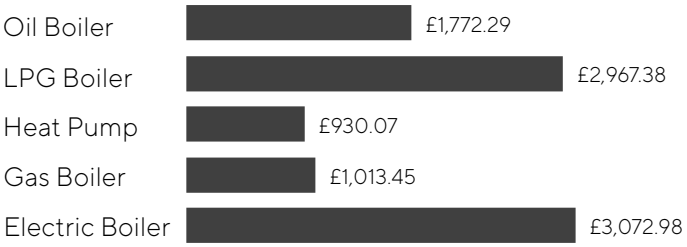
EXAMPLE DWELLING 2

A four-bedroom detached rural renovation (240m2)

Air Source Heat Pump: £13,932.14

Potential Carbon Saving: 81.07%

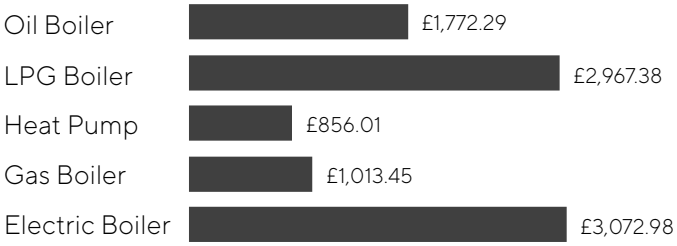
Annual fuel consumption cost comparison:



Ground Source Heat Pump: £29,326.71

Potential Carbon Saving: 82.58%

Annual fuel consumption cost comparison:



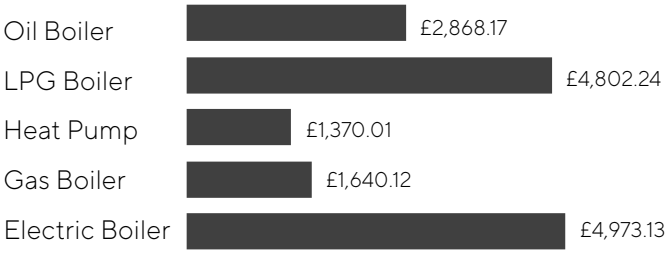
EXAMPLE DWELLING 3

An old four-bedroom solid wall property with land (240m2)

Air Source Heat Pump: £20,731.31

Potential Carbon Saving: 82.77%

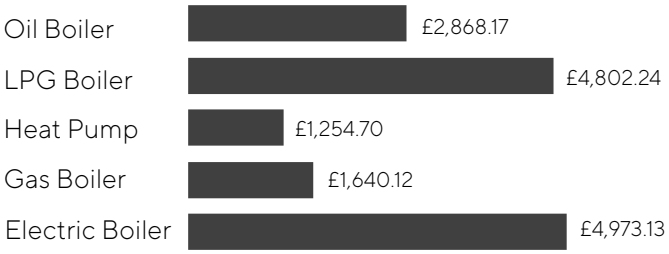
Annual fuel consumption cost comparison:



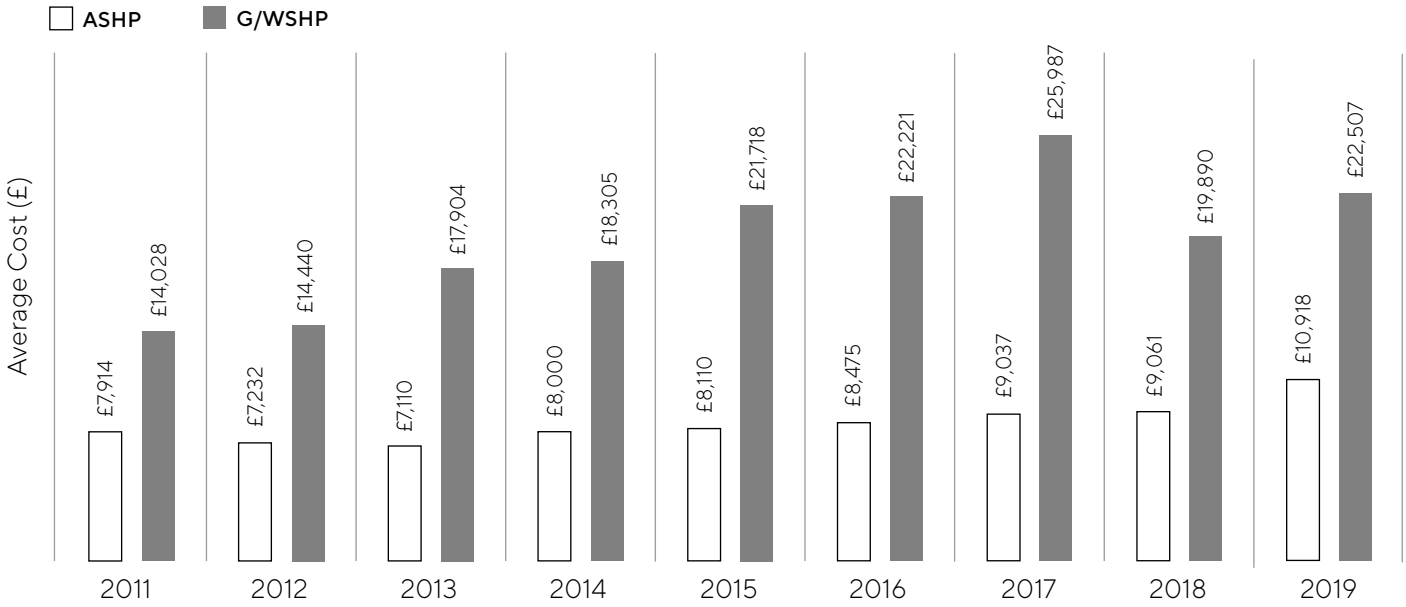
Ground Source Heat Pump: £44,438.16

Potential Carbon Saving: 84.22%

Annual fuel consumption cost comparison:



AVERAGE COSTS OF MCS REGISTERED INSTALLATIONS BY TECHNOLOGY



Avg. cost	YEAR								
TECH TYPE	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
ASHP	£7,914	£7,232	£7,110	£8,000	£8110	£8475	£9037	£9061	£10918
G/WSHP	£14,028	£14,440	£17,904	£18,305	£21,718	£22,221	£25,987	£19,890	£22,507

Note there are some variables that could be factored in, including economies of scale where possible. To devise the quotes, we had to work of a set of assumptions, including the following:

Dwelling 1: Small garden area, modern building regulations insulation standard – Part L1A, ASHP – Mitsubishi - Standard installation, GSHP - NIBE Inverter driven - needs to be borehole installation area not enough area for surface collectors due to garden size, electrical, builders and trenching work completed by others – using development resource.

Dwelling 2: Developer/builder managing the site, large garden area / paddock, modern building regulations insulation standard – Part L1B, ASHP – Viessmann - Standard installation, GSHP - Stiebel Eltron – Surface collectors in trenches, Electrical, builders and trenching work completed by others – using development resource, Replacement of heating system – By us or by subcontractors – possibly by developer – not included in the costs as this could vary considerably (if necessary).

Dwelling 3: Replacement system with no refurbishment, large garden area / paddock, little or no insulation other than insulation in loft, double glazing. Most likely sold walls and an old radiator system, no other trades on site, ASHP – Vaillant x 2 - Standard installation, GSHP - NIBE x 2 – Surface collectors in trenches, electrical work – by us or by subcontractors – not included in the costs as this could vary considerably, builders work by others – by us or by subcontractors – not included in the costs as this could vary considerably, trenching work by others – by us or by subcontractors – not included in the costs as this could vary considerably, replacement of heating system (if necessary) – by us or by subcontractors – not included in the costs as this could vary considerably.