

Ground Source Heat Pump Industry Manifesto - September 2015

1. Heat Pumps are required for the future energy mix, but the stimulus has been misapplied

To achieve our commitments under the Climate Change Act¹, Ground Source Heat Pumps will be one of the main heating technologies used within UK buildings². The corollary to the key references here is that **technologically, we can only meet our obligations under the Climate Change Act by ensuring the large scale implementation of Ground Source Heat Pump technology.**

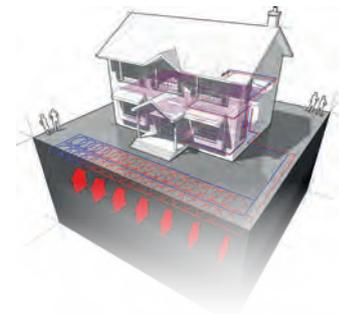
Proliferating the use of Ground Source heat Pumps, along with other measures, will **enable emissions reductions by 2030 of 60%**³. By 2030, gas and oil boilers will be a thing of the past; a legacy technology largely replaced by Heat Pumps^{4,5}.

In order to achieve our commitments, a **significant increase in Ground Source Heat Pump deployment is required**⁶. The existing infrastructure presents some economic barriers such that the required change will not be market led - external market factors are needed to stimulate the change^{7,8}.

The Renewable Heat Incentive (RHI)⁹ is a programme designed to lead this change. The next section explains how the current configuration of the RHI has not achieved its aims. **The RHI must be modified to steer it towards its original intent.** The intentions to stimulate growth, seed the technology and instigate the development of the supply chain have failed, due to higher incentives being offered for other renewable heat technologies.

If the Secretary of State is to achieve the objective of 15% energy from renewables by 2020 and the EU 2030 Energy Strategy

objectives¹⁰, this needs to be corrected.



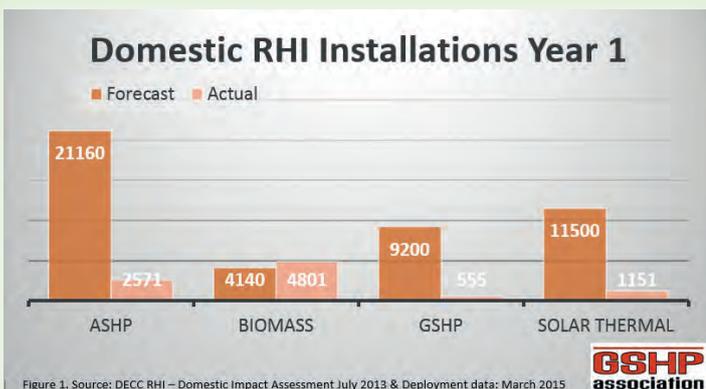
Ground Source Heat Pumps are entirely unobtrusive

Ground Source Heat Pumps are a low and zero carbon renewable technology¹¹. The UK has the opportunity to **develop World leading expertise** in this area, building on existing developments. Whilst achieving the low carbon agenda and tackling fuel poverty, there is an opportunity to **create jobs, increase skill levels** and experience real economic growth in the roundest sense.

However, **if the current rate of decline is not arrested, there will be further job losses, company closures and the loss of existing hard to come by experience.** Fundamentally, a very real cost to the UK economy.

2. Policy is distorting and failing the Heat Pump market

The first year of the domestic RHI aimed to incentivise the installation of **46,000** Renewable Heat systems¹². The total number of new accredited installations at the end of the first year was **9,078**¹³. The policy objectives of the RHI were twofold¹⁴: to help meet part of heat's share of the 2020 renewable target and to **prepare for mass roll-out of renewable heating technologies** in the domestic heating sector during the 2020s by building sustainable supply chains. Figure 1 shows clearly it is not achieving this objective.



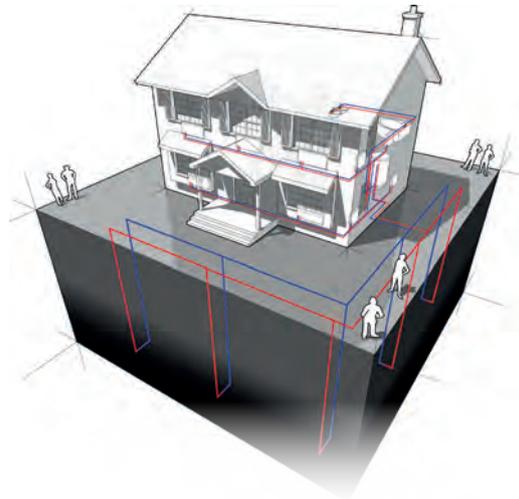
Call to Action

1. Mandate A+ in New Build.
2. Deeming for all domestic properties.
3. An upfront payment to cover the marginal cost of installation.
4. Increase the tariff beyond the current artificial limit.
5. Reduce the term for non-domestic RHI to 7 years, reducing the long term burden on Treasury.
6. Introduce look up tables and remove risk.
7. Reduce the costly MCS burden.
8. Reduce in use factors applied to heat pumps.
9. Link Allowable Solution credits to be awarded for ground loops.
10. Ensure that DNOs socialise the cost of network connections.
11. Target specific sectors with focused incentives.

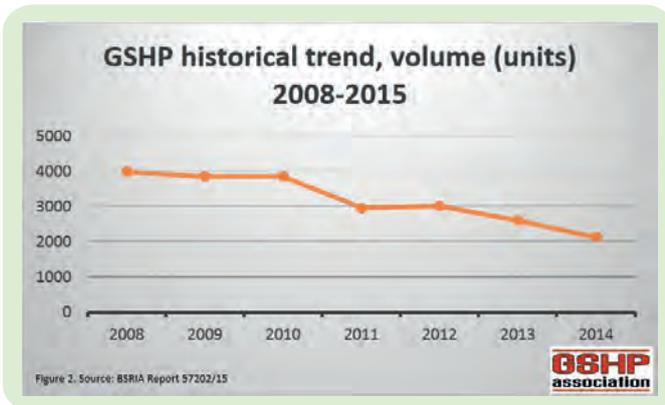
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Despite targeted policy with the opposite intention Figure 2 shows that **the Ground Source Heat Pump Market has declined steadily since 2009.**

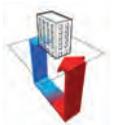
Since the launch of the Domestic RHI 77% of MCS registered ground source heat pump installers have not installed a heat pump. Several previously buoyant and industry leading companies have folded or are making losses as a consequence of the misplacement of the tariffs. **The RHI is failing a supply chain which had geared up to meet policy objectives.**



The legacy value of borehole infrastructure exceeds the life of the building. It should be **considered with other mains services** rather than compared to mechanical plant.



The marginal cost of a heat pump is high - i.e. the cost versus the equivalent boiler replacement. It is clear that not only is a suitable incentive required to encourage a switch to renewable heat, but **a significant upfront payment is necessary to facilitate change.** It is unrealistic to assume that householders can afford the marginal cost. The current RHI does not have a mechanism to provide an upfront payment, and poor tariff calibration (inaccurate system costs assumptions and an unrealistic counterfactual fuel price i.e. oil) makes the rate of return unattractive for securing retail finance options.



Poor tariff calibration has failed to take into account that biomass boilers are cheaper to purchase and install, and therefore biomass customers are receiving a higher incentive with a low upfront cost and a rate of return that distorts availability of finance and investment decisions. In a single policy move, the renewable heating market has been driven towards biomass boilers rather than providing a balanced market in which **the right technologies are targeted to the right customers.**



Little or no regard has been given to the **true carbon impact of the biomass fuel stock** supply chain which has already created an unsustainable bio-fuel supply time bomb. Conversely, grid carbon intensity is due to fall below 70g/kWh by 2030 and as a result the carbon impact of GSHP systems continues to approach zero carbon.



Policy makers have forced the industry to adopt a very expensive administrative burden within MCS solely for heat pumps. The **average additional cost of MCS administration alone per heat pump sale is £300.**



The non-domestic market has been further dented by poor understanding of the fundamental technology of ground source heat pumps within DECC and Ofgem resulting in **client uncertainty, hindering the progress of large scale projects.**



Government backed **building energy models use unrealistic and unsupportable performance deflators** (i.e. in-use factors) which means heat pumps do not appear to be as efficient and cost effective as they are in situ.



Ofgem introduced a policy for Distribution Network Operators (DNOs) to **socialise the cost of connecting heat pumps to the electricity network** but this network connection policy has been engineered to target only 10% of heat pumps.

3. The aims of the RHI can still be achieved by making adjustments to the existing scheme

Urgent reform to the policy is required in order to ensure that the policy achieves its aims. Heat pumps are an important technology for tackling fuel poverty and providing a safe, secure and cost effective long term energy future. With some changes to the existing policy mechanisms **their deployment can be put back on track.**

Mandate that all new build properties are installed with A+ rated heat generation plant. This would ensure the right technology for the right application.

Align the calculation of the RHI for all domestic properties, such that those linked to district heating systems are based upon **a deemed heat demand figure** in the same manner as individual residential properties. Allowing deeming on all domestic properties covered by the RHI including those covered by the non-domestic scheme will unlock significant opportunities within the social housing market.



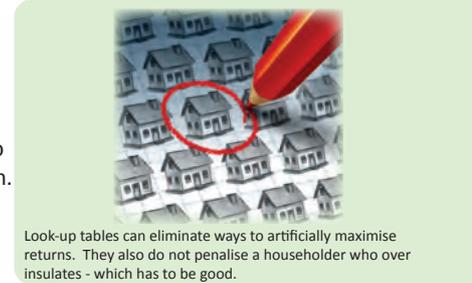
A+ equipment rating is already established.

Reform the policy to provide the necessary **upfront payment** which should cover at least the marginal cost of the heat pump installation.

Increase the Ground Source Heat Pump tariffs to ensure enough incentive is available over and above the marginal cost one off payment. This will require the removal of the poorly thought out value for money cap on GSHP tariffs. The value for money cap fails to recognise the long term infrastructure cost benefit of installing the technology. It is also derived of flawed logic: the renewable energy mix has many constraints and parameters, simplifying it to one level cost comparison when a blend of technologies will clearly be required unfairly skews the outcome. It should be noted that, unlike wind turbines or solar panels, heat pumps can generate the required output whenever there is a demand

Reduce the term for non-domestic RHI to 7 years from the current 20 while maintaining overall rates of return. This will encourage uptake and reduce the long term burden on treasury.

Introduce a dwelling look up table to make it easier for the customer to identify the value of RHI to be received and the one off payment value. This will also remove the risk of over-high consumption.



Look-up tables can eliminate ways to artificially maximise returns. They also do not penalise a householder who over insulates - which has to be good.

Reduce the MCS burden by stripping away red tape paperwork that links the scheme to RHI (e.g. the Compliance certificate, star ratings for heat pumps and Energy Performance Certificate requirements).

Immediately **reduce the in use factors applied to heat pumps** in building models that penalise performance assumptions without statistical basis.

Broaden the domestic scheme to include new build applications for ground source heat pumps, **linking Allowable Solution credits** to be awarded for ground loop investment.

Examine the rules for connecting heat pumps to the energy network and ensure Distribution Network Operators are fulfilling their obligations to Ofgem rules and **socialising the cost of all connections.**

Fast track **consideration of specific sectors to receive targeted incentives**, for example, Social Housing and Fuel Poor, Off Gas Grid, Food Retail, Public Buildings.

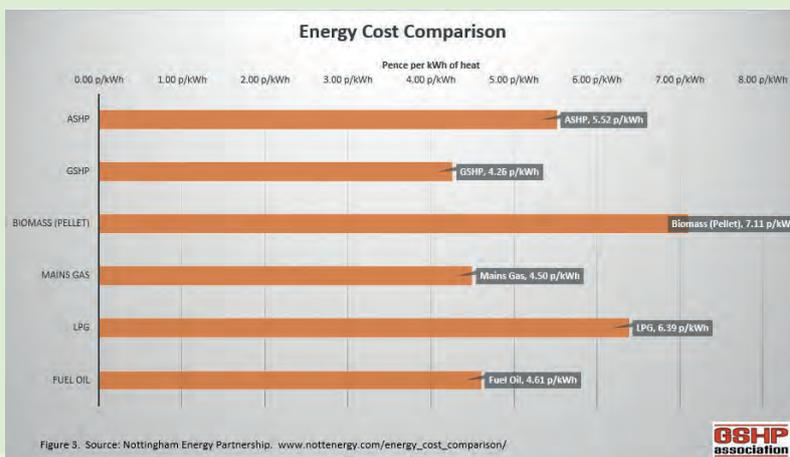
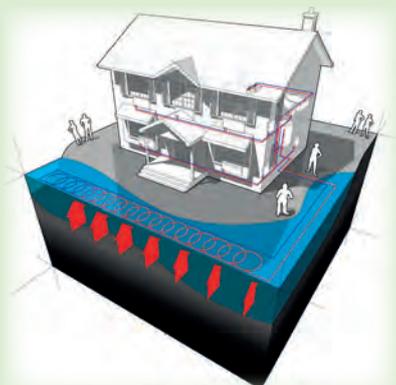


Figure 3. Source: Nottingham Energy Partnership. www.nottenergy.com/energy_cost_comparison/



Ground Source Heat Pumps have the lowest fuel cost for heating buildings.

References

1. **Climate Change Act 2008** c.27 Part 1, Carbon Target and Budgeting, The Target for 2050. (1) It is the duty of the Secretary of State to ensure that the net UK carbon account for the year 2050 is at least 80% lower than the 1990 baseline.

2. **The Future of Heating: Meeting the challenge.** DECC March 2013 c.3: Heat and Cooling for Buildings. 3.50 The results (see Evidence Annex) confirm the overall picture presented in the Strategic Framework, with large scale deployment of both air and ground source heat pumps, a greater role for heat networks by 2050 and gas playing a major role into the 2030s but diminishing thereafter.

3. **The Fourth Carbon Budget.** Committee on Climate Change December 2010 c.6. Emissions reduction opportunities: bottom-up analysis. Our three abatement scenarios involve different levels of electrification of heat and transport, low-carbon generating capacity, energy efficiency, technology deployment, and use of bioenergy. They achieve emissions reductions in 2030 of 51%, 60% and 69% relative to 1990.

4. **The Future of Heating: Meeting the challenge.** DECC March 2013 c.3: Heat and Cooling for Buildings. 3.53 DECC has modelled the same scenarios with the ESME model. This shows a similar overall picture for the role of gas boilers, with the model predicting that there will be no role for gas boilers in 2050.

5. **2050 Pathways Analysis.** DECC July 2010 Part 2 Detailed sectoral trajectories. Section C: Industry. Assumptions on energy intensity and process emissions. This shift implies that most space heating is provided by electric heat pumps.

6. **The Fourth Carbon Budget.** Committee on Climate Change December 2010 c.6. Emissions reduction opportunities: bottom-up analysis. The Medium abatement scenario aims for mass-market deployment of heat pumps.

7. **Renewable Heat Incentive – Domestic. Impact Assessment.** DECC July 2013 Rationale for Intervention: Section 5. The domestic RHI has a two-fold purpose, firstly to contribute renewable energy in order to meet the UK's 2020 target for sourcing 15% of energy demand from renewable sources. Secondly to help develop the renewable heat market and supply chain so that it is in a position to support the mass roll out of low carbon heating technology required in the 2020s and onwards in order to meet decarbonisation targets. The domestic RHI is designed to achieve these goals by incentivising cost effective installations, creating cost reductions for installation and operation and finally improving performance of renewable heating systems; Section 6. The market for domestic renewable heat is currently very small and less mature than for conventional technologies such as gas, oil and electric resistive heating. This is because renewable heat options such as air source heat pumps (ASHP), ground source heat pumps (GSHP), biomass boilers and solar thermal are largely unable to compete on costs with conventional heating options; Section 7. In addition to cost differences there are a number of non-financial barriers to the uptake of renewable heat; for example the risk (perceived and real) associated with installing relatively less mature technologies, or the required behavioural change necessary to use the renewable heat technologies; Section 8. The tariff offered by the domestic RHI scheme should address the issues identified above by making renewable heating technology competitive with conventional technology in terms of costs.

8. **Domestic Renewable Heat Incentive: The first step to transforming the way we heat our homes.** DECC 12th July 2013 C.1 Introduction. Almost all of the heat we use for heating our homes and hot water today comes from burning fossil fuels. Only a very small proportion of households use renewable heating. This means that domestic heating accounts for around 28% of UK energy demand. 2. By 2050, emissions from heating in homes will need to reduce to almost zero to meet our goal of reducing emissions across the economy by 80%. To achieve this we need to prepare now for mass rollout of low-carbon heating in the 2020s.

9. **Energy Savings Trust (<http://www.energysavingtrust.org.uk/renewable-heat-incentive>)** The Renewable Heat Incentive (RHI) is a UK Government scheme set up to encourage uptake of renewable heat technologies amongst householders, communities and businesses through financial incentives. It is the first of its kind in the world and the UK Government expects the RHI to contribute towards the 2020 ambition of 12% of heating coming from renewable sources. In 2012, phase one of the Renewable Heat Incentive (RHI) launched to support the UK's non-domestic sector. The domestic RHI, was launched on 9th April 2014 and provides financial support to the owner of the renewable heating system for seven years. The scheme covers England, Wales and Scotland and is targeted at - but not limited to - off-gas households.

10. **2030 Framework for climate and energy.** European Commission 22 January 2014 Targets for 2030: a 40% cut in greenhouse gas emissions compared to 1990 levels; at least a 27% share of renewable energy consumption.

11. **DIRECTIVE 2009/28/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 23 April 2009** on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC

12. **Renewable Heat Incentive – Domestic. Impact Assessment.** DECC July 2013 Table 7: Summary of key deployment impacts of Domestic RHI

13. **RHI deployment data: March 2015** DECC Table 2.1

14. **Renewable Heat Incentive – Domestic. Impact Assessment.** DECC July 2013 What are the policy objectives and the intended effects? The domestic Renewable Heat Incentive (RHI) scheme aims to (1) incentivise the roll out of renewable heating systems in the domestic sector to help meet part of heat's share of the 2020 renewable target. (2) Prepare for mass rollout of renewable heating technologies in the domestic heating sector during the 2020s by building sustainable supply chains, improving performance, reducing costs and reducing the barriers to take-up of these technologies.

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