

Heat in Buildings Team  
Department for Business, Energy & Industrial Strategy,  
6th Floor, Abbey 2,  
1 Victoria St  
London, SW1H 0ET

11<sup>th</sup> June 2018

## **Response: A future framework for heat in buildings: a call for evidence**

Dear Sir/Madam,

Scottish Renewables is the representative body for the renewable energy industry in Scotland, working to deliver secure supplies of low-carbon, clean energy for heat, power and transport at the lowest possible cost. We represent around 260 organisations ranging from large suppliers, operators and manufacturers to small developers, installers and community groups, and companies right across the supply chain. We have around 60 members active in heat, predominantly in the district heat, biomass and electric heat pump sectors, ranging from manufacturers to developers and installers.

### **Introduction**

Scottish Renewables welcomes this call for evidence. With only a few years until the current funding round of the RHI comes to an end it is vital that early clarity is given to the the low-carbon heat supply chain on the policies that will support future deployment. Lead times for larger projects can span several years which means that uncertainty regarding RHI funding will begin to affect the market for these projects in 2019. The biomass sector has already contracted significantly in recent years and further uncertainties will put companies and jobs at risk.

We strongly support the UK Government's stated intention to phase out the highest carbon forms of heating during the 2020s. The replacement of high-carbon fuels currently used in off-gas grid areas presents an opportunity to continue to grow markets and supply chains for established technologies like biomass boilers and heat pumps, building on the solid foundations established by the RHI. These technologies may have a role to play in on-gas grid areas, first in new buildings and district heat networks but also in retrofit on-gas buildings; especially should the deployment of low-carbon gases (like hydrogen) for use in existing gas networks prove technically or commercially unviable<sup>1</sup>.

### **Scotland and devolved powers**

Scotland has accounted for approximately 20% of total deployment under the RHI, versus a 10% share of the UK population, reflecting its higher proportion of off-gas grid buildings. Although heat policy is a devolved issue, Scotland opted into the UK Government's RHI scheme and this has been the primary driver for an increase in the share of renewable heat in Scotland from 2 to 4.5% of total

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<sup>1</sup> CCC, Next Steps for UK Heat Policy, 2016

non-electrical heat demand<sup>2</sup>. The Scottish Government has set out clear targets for the role of renewable heat in its recent Climate Change Plan (equivalent to the Clean Growth Strategy), targeting an increase by 2032 in the share of renewable heat to 35% in the domestic sector (from 15% today, including electric heat) and 75% in the commercial sector (from 52% today, including electric heat)<sup>3</sup>. This is to be delivered through the Scottish Government's 'Energy Efficient Scotland' programme, a multi-decade package of regulations, incentives and delivery programmes. However, the Scottish Government has yet to make clear how it will support low-carbon heat beyond the end of the RHI and we welcome this opportunity to set out recommendations that could be implemented by both Governments.

Before answering the questions, we would like to highlight two critical issues that we feel are not adequately dealt with in the call for evidence:

### **Avoiding a cliff-edge in the retrofit market**

The retrofit of low-carbon heating systems to existing buildings will deliver the bulk of the emissions reductions needed to meet carbon budgets, due to the very slow replacement rate of the building stock<sup>4</sup>. The RHI has successfully stimulated the development of a low-carbon heating supply chain equipped with both the technical and commercial expertise to sell these technologies to private householders and businesses. It is therefore vital that the future framework of policies provides continuity and allows this supply chain to grow. Without this, there could be a near collapse of the retrofit market. The best way to achieve this is through the combination of incentives and regulation:

- The installation of high-carbon fossil fuel heating should be phased out from 2025, and after this date no new installations of coal, oil and LPG boilers should be permitted.
- Continue incentives for retrofit installations in off gas grid buildings, both to encourage take up before regulations enter force and to aid with compliance afterwards.

We are concerned that at present, the proposals in the call for evidence focus on the changing the supply of heating in off-gas grid areas by requiring incumbent industries to drive the change. Without incentives and regulation to support *demand* for low-carbon heat, it will be very difficult for these firms to increase uptake by consumers. Most of these firms also have little or no experience in selling, designing and maintaining low-carbon heating systems, and will be unsuited to driving the change at the scale and speed required.

Similarly, there are risks in encouraging the growth of hybrid technologies or alternatives such as bioliquids to facilitate the initial transition of high carbon industries. These technologies are relatively undeveloped in the UK, and should policy allow these technologies to become the near-term focus this will do little to maintain or grow the market for established technologies and biomass and electric heat pumps. These technologies should only be encouraged to aid compliance, by introducing some flexibility for harder to treat buildings.

### **Low-carbon heat networks**

Although we support the intention to target the off-gas grid sector, the RHI also plays a crucial role in supporting low-carbon heat to feed district heat networks, the majority of which are built in gas

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<sup>2</sup> Energy Saving Trust, Renewable Heat in Scotland, 2017

<sup>3</sup> Scottish Government, Climate Change Plan 2018

<sup>4</sup> CCC Next Steps for UK Heat policy, 2016

network areas. By focussing exclusively on the off-gas grid sector, this call for evidence limits the scope of where policy intervention is needed. District heat networks are an important part of both the UK and Scottish Government's decarbonisation strategies and it is therefore important that the UK Government set out how its policies will support their decarbonisation. We recommend that the RHI also be continued to support large-scale low-carbon heat generation feeding district heat networks. This will ensure that heat networks have a route to decarbonisation as well as supporting the emerging technologies to help them do so.

We set out our answers to the call for evidence questions below.

Yours Sincerely,

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## Long term plan to phase out high carbon heating

### **1. Do you agree that the policy framework should focus initially on enabling the market to drive the transition away from high carbon fossil fuels, and in the longer term on helping consumers and industry to comply with regulations?**

We do not agree that the policy framework should focus initially on enabling the market to drive the transition and then on compliance with regulations. We believe that regulations should be implemented in conjunction with market support, to ensure that the existing low-carbon heating supply chain is able to expand and grow, building on the skills and expertise garnered thanks to the RHI.

For retrofit installations in off gas grid buildings it will remain crucial to enable the market to drive the transition with continued incentives, both to encourage take up before regulations enter force and to aid with compliance afterwards. Incentives cannot on their own cannot drive all users to adopt a new technology, as has been demonstrated by the low take up in some off-gas grid markets despite the availability of the RHI. Regulations, signalled far in advance, will drive change by both consumers and industry, at the scale that is required to meet carbon budgets. We therefore recommend that the installation of high-carbon fossil fuel heating should be phased out from 2025, and after this date no new installations of coal, oil and LPG boilers should be permitted.

This should be combined with training and support for incumbent industries to adapt, and possibly obligations. However, the emphasis in the consultation on driving change through obligations on the fossil-fuel heating supply chain is unlikely to be successful. Without incentives and regulation to support *demand* for low-carbon heat, it will be very difficult for these firms to increase uptake by consumers. Most of these firms also have little or no experience in selling, designing and maintaining low-carbon heating systems, and will be unsuited to driving the change at the scale and speed required.

For new buildings we believe that regulation is sufficient to drive the change required, as it is cheapest and easiest to install low-carbon heat in a new building. We therefore recommend that standards for new buildings both on and off the gas grid are tightened such that all are required to low-carbon heating from 2021. Building standards in Scotland were tightened in 2015 and have led to an increasing use of electric heat pumps and biomass boilers (c. 20% of new homes are now fitted with a low-carbon heating system).

### **2. How should government best engage with existing and emerging heating markets, consumers and other stakeholders, to ensure regulations are designed in a way that works for everyone?**

Government should engage with incumbent and low-carbon heating industries, and ensure that this is done on a regional as well as national basis. It is likely that Scottish Government will look to BEIS' lead on the design of the post 2021 policy framework. Ensuring that the supply chain in Scotland is fully engaged in UK policy development will be important to ensure that any new policies work for all sectors and parts of the UK.

### **3. How could a firm end date for high carbon fossil fuel installations be delivered through regulations? How much time do manufacturers, suppliers and installers trading in high carbon fossil fuels need to prepare for a firm end to new installations?**

We strongly support a firm end date for high carbon fossil fuel installations. This will give consumers a driver to consider and ultimately adopt low-carbon heating, bolstering the existing low-carbon supply chain, and give incumbent fossil fuel industries the impetus to adapt and change their businesses.

We recommend that high-carbon heating be phased out in existing buildings from 2025; after this date no new installations of coal, oil and LPG boilers would be permitted. This should be implemented through building regulations (section six in Scotland covering heating system upgrades, Part L in England and Wales) for both domestic and non-domestic buildings.

Bringing regulations into force in 2025 would give industry and consumers over five years to prepare. Given the life time of high-carbon heating systems (15 to 20 years), setting a phase-out date any later than 2025 in off-gas-grid properties will see significant emissions from this sector in 2040, by which time emissions from heating will need to be significantly reduced to meet Government carbon targets. The UK would not be acting alone: Denmark has already enacted a phase-out of oil boilers since 2013 for new buildings and since 2016 for existing buildings, and Norway will ban the use of oil for heating in 2020.

Regulation can help provide a stable pathway for low-carbon heat to become less dependent on subsidy. Over time, regulation will become the key driver for demand, with subsidy aiding compliance rather than incentivise behaviour. In this scenario, lower levels of subsidy may be required. Regulation will also help foster a stable and growing low-carbon heat market, allowing technology costs to fall, further enhancing the potential for lower levels of subsidy.

Only by combining regulations and incentives can Government provide a stable pathway for the low-carbon heat supply chain as it transitions after 2021. The withdrawal of subsidy post April 2021 would likely lead to a collapse in the retrofit market, putting at risk a supply chain in Scotland which employs 3,000 people<sup>5</sup>. Even if a phase out date enters force in 2025, the market will still face several years of uncertainty and low demand, as consumers will have little incentive to make low-carbon heating replacements until the regulations enter force. An incentive is likely to be the most effective way to mitigate this risk. A further measure could be a back-stop date for compliance for all buildings by 2035. This would capture all remaining high-carbon boilers that had yet to be replaced and give consumers an incentive to consider a low-carbon replacement before 2025. It could be enforced via the existing safety inspection regime for oil and LPG boilers.

## Technologies for off-gas grid areas

### **4. What is the potential for non-domestic buildings to transition away from the use of high carbon of fossil fuel heating? Is the use of high carbon forms of fossil fuel driven by process heating requirements, with space and water heating requirements secondary to this? Are different solutions required for different heat uses and are there cleaner alternatives?**

There is good potential for the non-domestic building stock in Scotland to transition away from the use of high-carbon heating. The majority of energy use in these buildings is for space and hot water heating rather than process heat, with a variety of technologies such as biomass boilers, electric

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<sup>5</sup> ONS, UK Environmental Accounts: Low Carbon and Renewable Energy Economy Survey: 2016 final estimates

heat pumps and solar thermal systems suitable to replace existing fossil fuel heating systems. The appropriate technology will depend on many factors specific to a building (occupancy, heating load, location, access to energy networks) and it is likely that a mix of technologies will be required to decarbonise these buildings, alongside some energy efficiency upgrades.

**5. What do you think are the main technology choices for reducing heating emissions from off gas grid households, businesses and public sector organisations (e.g. transitional technologies)?**

We do not believe that transitional technologies like hybrid heat pumps should play a significant role in decarbonise off gas grid buildings. Oil or LPG and heat pump hybrid systems are relatively rare, reflecting the fact that where a heat pump installation is possible, there is little technical or economic rationale for fitting a hybrid system. In some instances, hybrid systems are being installed due to customer unfamiliarity, but this is better addressed by increasing the size of the market with the right mix of policies. Hybrid systems may play a role in facilitating compliance with regulations, by allowing partial decarbonisation in buildings where it is not technically or economically feasible to switch to a fully low-carbon system. The role of such technologies should be carefully managed however. It is likely that incumbent supply chains will prefer to offer such systems, especially at the start of a transition, and if standards are set too low these may effectively capture most of the market, ahead of long-term decarbonisation options like heat pumps and biomass boilers.

**6. What do you think are the main technology choices for achieving near zero emissions from off gas grid heating (technologies which are consistent with our 2050 targets)?**

Biomass, electric heat pumps and solar thermal are the main technologies to reduce emissions to near zero. Scotland has access to a large and growing forestry resource that can provide a domestic low-carbon fuel resource and is already on the way to fully decarbonising its electricity supply, with the potential to generate significantly more electricity from renewable sources<sup>6</sup>.

**Biomass, bioliquids and biopropane**

**7. What evidence is there that bioliquids can provide an affordable and sustainable alternative to fossil fuel heating? What are the technical barriers and what might the impacts on domestic and business consumers be? How scalable are sustainable supply chains and is there a maximum amount of bioliquids which can be supplied?**

We are not aware of bioliquids being used for heating in Scotland. Switching oil and LPG heating over to bioliquids remains untested, and it will likely require a significant amount of time to develop domestic manufacture capable of meeting the UK's oil and LPG heating demand. Such a shift in policy focus would delay the UK's decarbonisation efforts and put existing low-carbon supply chains at risk of collapse. The Committee on Climate Change has made clear that establishing a retrofit electric heat pump market should be a Government priority, to ensure that this technology can be scaled up should low-carbon gases currently being explored for use on the gas grid fail to live up to expectations<sup>7</sup>.

**8. What evidence is there that biopropane can provide an affordable and sustainable alternative to fossil fuel heating? What are the technical barriers and what might impacts**

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<sup>6</sup> WWF Scotland, The Energy of Scotland, 2016

<sup>7</sup> CCC, Next steps for UK heat policy, 2016



**on domestic and business consumers be? How scalable are sustainable supply chains and is there a maximum amount of biopropane which can be supplied?**

Not answered.

**9. Do you have any evidence on the air quality impacts of the use of solid biomass, bioliquids and/or biopropane?**

Not answered.

### **Hybrids**

**10. Are there any oil and heat pump hybrids currently on the market (in the UK or elsewhere), and if so how does the cost compare with conventional systems or with a heat pump? Could they be used with bioliquids? What impacts do they have for domestic and business consumers, for example in terms of ease of use and comfort levels?**

Our members do not report installing such systems.

**11. We understand there are gas heat pump hybrids on the market that can be used with LPG. How widespread are these (in the UK or elsewhere) and how does the cost compare? Could they be used with biopropane or other biogases? What impacts do they have for consumers, for example in terms of ease of use and comfort levels?**

Our members do not report installing such systems.

**12. What role might hybrids have in the short term to facilitate the longer term transition to clean heating off the gas grid?**

Hybrid systems may play a role in facilitating compliance with regulations, by allowing partial decarbonisation in buildings where it is not technically or economically feasible to switch to a fully low-carbon system. The role of such technologies should be carefully managed however. It is likely that incumbent supply chains will prefer to offer such systems, especially at the start of a transition, and if standards are set too low these may effectively capture most of the market, ahead of long-term decarbonisation options like heat pumps and biomass boilers.

### **Electric heat**

**13. To what extent are space requirements an issue during a heat pump installation? How often are heating distribution systems replaced (hot water tanks, radiators and/or pipework)? How often are additional thermal efficiency measures for the building required?**

Space is rarely a limiting factor for heat pump installations in domestic properties off the gas grid, where homes tend to be larger and where oil systems and their large storage tanks mean that utility space is often available. Draught proofing is very often needed although more substantial efficiency upgrades like wall insulation are less common. Heat pumps have been successfully retrofitted to a wide variety of homes that are found in rural Scotland, including older stone walled properties.

**14. What potential is there for heat pump costs to come down (both kit and installation)? How can industry show leadership in making this happen?**

Heat pumps are a mature technology and there is limited scope for retrofit costs to fall other than in installation cost. The retrofit market is small and an increase in market size, encouraged by long-term supportive Government policy, will help decrease installation costs and improve quality. There is also the potential to save costs through the sharing of ground-loop systems for ground source heat pumps.

**15. Are there any drawbacks of smart/more efficient storage heaters, vs other types of electric heating? And, if so, how are these to be overcome? What are the benefits of smart and more efficient storage heater products compared to traditional storage heaters? In which types and tenure of buildings are storage heaters most likely to be useful? Would storage heaters be a likely solution where electric heating is not currently used? How about where electric heating is currently the secondary heating source?**

Not answered.

### Rural heat networks

**16. Is there scope for more use of rural heat networks and communal heating systems? What are the barriers and how might they be overcome?**

There is significant scope for more use of small rural heat networks. Many schemes have already been developed in Scotland, but key barriers remain in identifying opportunities and coordinating different building owners. The best way to support new projects is likely to be funding for project development.

**17. Are there specific ownership and funding models that may be suitable for heat networks and communal heating systems in off gas grid areas?**

Not answered.

### Innovation

**18. What evidence is available about further innovations to improve the performance, efficiency and customer proposition of heat pumps? Are there opportunities for innovation in delivery and installation, particularly those innovations that might reduce kit and installation costs or hassle for consumers?**

Not answered.

**19. What is the role of the heating industry in delivering cost reduction through innovation? What steps is the industry already taking and what more could be done?**

Not answered.

**20. What other innovation opportunities and innovative technologies are available for rural homes off gas grid? At what technology readiness level are they and do they require government support to move them towards the market?**

Not answered.

**21. What can government do to ensure that future policy encourages and supports future innovations and cost reductions in technologies?**



Installation costs have the most potential for cost reduction and education and skills in the supply chain are therefore the critical. The retrofit off gas grid market has contracted in recent years, leading to fewer installers and fewer training opportunities. It will be vital that resources are made available to incumbent and low-carbon heating installers to improve skills and awareness should the rate of low-carbon uptake be substantially increased.

## Enabling uptake

### **22. Please provide views and evidence on how different obligation approaches could be used to drive the transition to clean heating during the early 2020s? Are there any areas worth specifically targeting? Are there situations in which obligations would be counter-productive? Do you have any views on other short term regulatory options that could be pursued, besides those considered above?**

Obligations could have a role to play alongside regulation of end-users. We recommend that high-carbon heating be phased out in existing buildings from 2025; after this date no new installations of coal, oil and LPG boilers would be permitted in buildings where mains gas is not available. This could be accompanied by an obligation on oil and LPG suppliers, with the required proportion of low-carbon heating installations increasing year on year leading up to the start of the regulations (see our answer to Q23 below).

Similarly, biomethane production for heat purposes (biogas combustion or grid injection) could be funded through an obligation on gas suppliers, rather than funding projects via general taxation as is currently the case with the RHI. This would replicate the successful model of the renewables obligation, where large utilities were obligated to adopt new renewable technologies. It would also ensure that some decarbonisation costs are levied on natural gas, which in the UK faces some of the lowest taxes found in the EU<sup>8</sup>. At present the majority of decarbonisation costs are levied on electricity users, including those for energy efficiency programmes which have a greater impact on gas rather than electricity consumption.

### **23. What do you think about the options set out above for an obligation? Do you have any evidence as to potential impacts, burdens or unintended consequences?**

**Information provision obligation on fossil fuel boiler installers:** although there is a need to raise general consumer awareness of low-carbon heating options, we do not believe that this proposal would drive the change required in a post RHI market. Without a regulatory requirement to comply with, those high carbon heating installers who do not currently offer low-carbon alternatives will have very little incentive or ability to provide meaningful advice. This option would need to be complemented with regulation of end-users or the supply chain to specify low-carbon heating.

**Funding for energy efficiency of homes:** we support the opening up of fuel poverty schemes such as ECO to provide low-carbon heating replacements as well as energy efficiency upgrades. To date the scheme has largely focussed on urban areas, given the higher density of potential clients and economies of scale, and it will need to increasingly operate in rural areas to cover all remaining fuel poor homes. It makes no sense to continue to publicly fund high-carbon heating replacements (as has been the case with ECO) if the intention is to phase these out during the 2020s. Making

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<sup>8</sup> [http://ec.europa.eu/eurostat/statistics-explained/index.php/Natural\\_gas\\_price\\_statistics](http://ec.europa.eu/eurostat/statistics-explained/index.php/Natural_gas_price_statistics)

ECO funding available to fuel poor households would ensure that lower income consumers are able to afford heating system replacements after our suggested phase out date in 2025.

**A role for Distribution Network Operators (DNOs) or Gas Distribution Networks (GDNs) in supporting the take-up of clean heating:** DNOs may have a role to play in supporting the take-up of clean heating by identifying opportunities where energy efficiency or heating demand management can free up grid capacity at lower cost than physical upgrades. On the Scottish Island of Mull, the ACCESS project has allowed the addition of a new hydro generating station to a constrained network by linking the generator to a system of active network management, where storage heaters are remotely turned up to absorb generation when the network is saturated<sup>9</sup>.

Although an obligation on DNOs could be a useful supporting policy, there are a number of challenges that could mean that this is a complex policy relative to the potential benefits. There is not as yet a clear and transparent process to identify opportunities where energy efficiency and heating upgrades can help prevent network upgrades. Whilst this may arise from the transition from DNOs to DSOs (where operators contract for local network management services) the future regulatory framework for this is still evolving (see the ENA's Open Networks project) and is driven by the need to provide a variety of electricity system services rather than external assets to the networks. There is little consideration of this approach at present in the process. Similarly, even if a market evolves in future, it is not clear that the network savings would sufficiently fund the upgrades required. Lastly, distribution network upgrades are primarily driven by the need to connect new generation assets, rather than new demand. This will make it hard to predict where opportunities may arise as well as their volume.

**Obligation on manufacturers or suppliers of oil systems:** this proposal could function if coupled with a phase out date for high-carbon heating in 2025, with the obligation increasing from 10% in 2021 to 100% by 2025. This would help drive the market during the critical period when the RHI ends in 2021 to regulations entering force in 2025, particularly if incentives are no longer available. Any such scheme would need to be met through tradeable certificates, to ensure that existing low-carbon installers are able to benefit from this policy.

**Obligation on suppliers of oil:** as outlined in our response to question 7, we do not believe that there is a market for biofuels in the current heating market, nor should efforts be made to create one. Suppliers of oil could be obligated to deliver alternative clean heating systems, or pay into a fund to do so, but would likely struggle given the differences with their current business models.

**24. What further options for short term regulation exist that we have not considered in this call for evidence? Do you have any evidence as to the associated impacts or burdens of any further options suggested?**

We recommend that the installation of high-carbon fossil fuel heating should be phased out from 2025, and after this date no new installations of coal, oil and LPG boilers should be permitted.

Alternative approaches could include carbon taxation on fossil fuels, to reduce the cost gap with low-carbon alternatives. Other options for incentives include council tax and stamp duty incentives for buildings that meet proposed heating and carbon requirements.

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<sup>9</sup> <http://www.accessproject.org.uk/news/>

## **25. How can DNOs or GDNs take a leading role in deploying clean heating?**

We do not believe that DNOs or GDNs should be relied upon to take a leading role in deploying clean heating. As outlined in our response to question 23, there are significant challenges to creating a regulatory environment that would incentivise these organisations to make significant investment in energy efficiency and clean heating. Similarly, experience to date has been that opportunities to channel funding from network operators to these upgrades have been limited.

### **Financing**

## **26. How can we encourage and unlock private sector finance in the absence of a subsidy?**

Regulation is the best tool to unlock private sector finance in the absence of subsidy. The retrofit low-carbon heating market suffers from low demand, despite the presence of incentives. Only a strong near and long-term regulatory driver can create the market demand that will see private investment by households and businesses. However, the economics of low-carbon alternatives are such that subsidy will still be required to help consumers manage the higher upfront costs of these technologies.

## **27. If there was some targeted subsidy, such as for low income or vulnerable households or for building local supply chains, what would this need to look like? Do you have any evidence that subsidy is necessary?**

We believe that there is a strong case for targeted subsidy for retrofit installations in off-gas grid buildings, and for low-carbon heat generators feeding district heat networks.

### **Retrofit installations**

Subsidy will continue to be required for retrofit installations in off-gas grid buildings to ensure that off-gas grid areas, that already face higher heating costs than those on gas and have higher instances of fuel poverty<sup>10</sup>, are not financially disadvantaged by a switch to cleaner heating. Low-carbon heating systems have higher upfront costs which can make technologies harder to finance. Some, but not all, of these costs can be recovered through lower running costs for electric heat pumps and biomass systems, and subsidy will therefore be required to facilitate and encourage compliance with regulation.

Fuel poor households should be supported with the majority of the cost of heating system replacements and this should be delivered through existing schemes such as ECO. Support should also be made available to building owners in the domestic and commercial sectors, ideally using the existing RHI framework. Although upfront payments (such as a scrappage scheme) could be an alternative for the domestic sector, this creates risks of a boom and bust cycle for the supply chain and removes the ongoing incentive for consumers to keep and maintain their low-carbon heating system. The cost effectiveness of future subsidies could be improved by benchmarking them against the price of the fossil fuel that is replaced. RHI payments would adjust to prevent over-compensation in the event that the reference fossil fuel decreases in price (in a similar manner that Contracts for Difference work in the electricity sector).

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<sup>10</sup> Scottish Rural Fuel Poverty Taskforce, Action Plan to Deliver Affordable Warmth, 2016

Coupling incentives with long term regulation to phase out high-carbon heating should also ensure a larger and more predictable volume of future work, enabling improved quality and lower installation costs, allowing levels of subsidy support to be reduced over time and eventually phased out.

### **Low-carbon heat networks**

We also believe that there is a strong case to continue subsidy support for low-carbon heat generation where this is feeding district heat networks. This will allow the decarbonisation of district heat networks by supporting emerging UK markets for technologies like large scale ground, water and air source heat pumps, geothermal and waste heat recovery. Most heat networks are constructed in on-gas areas and to be viable must sell heat at least at the same rate as heat from mains gas. Without a continued subsidy to close the gap between low-carbon heat generation and gas, the installation of low-carbon heat generation into heat networks will be severely limited. Gas CHP is the technology of choice for larger heat networks and although this provides some primary energy saving over separate heat and electricity generation, the rapid decarbonisation of electricity is reducing the benefits that CHP provides to that system. CHP systems installed today will still be operational in 2040, by which point emissions from heating will have to had reduced significantly.

Large scale electric heat pumps drawing energy from the ground, water or sources of waste heat have a large potential to help decarbonise heat networks. However, their economics versus heat from mains gas is deteriorating as the costs of electricity rise. There are a number of additional policy costs levied on electricity that are not applied to gas and supporting large scale electric heating will help level the playing field.

Recent major reforms to the RHI (pre-accreditation for larger schemes, third party assignment of rights) have created a strong framework that will provide for further investment in large-scale low-carbon heat generation. The UK Government should look to retain the expertise developed in administering the scheme and deploying new innovative financing solutions.

### **Novel approaches**

#### **28. Novel business models for selling clean heating have not taken off in the UK market, why is this? What is needed to stimulate the development of this market in the UK?**

The retrofit low-carbon heating market is too small at present to support such business models. Consumer awareness of low-carbon heating is low, and future growth of the market remains uncertain. Energy markets are also highly regulated, creating high barriers to entry for new market entrants and business models. Recent changes to the RHI allowing the assignment of rights to a third party are already supporting the development of innovative new business models. This is creating new opportunities for businesses to offer low-carbon heat as a service, with the RHI serving as both an inducement and a mechanism by which large scale projects serving district heat networks can compete with heat from gas<sup>11</sup>. However, with just three years left before the proposed end of the RHI scheme, there is little incentive for businesses to continue to invest in such approaches.

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<sup>11</sup> See Star Renewables' proposed project in the Gorbals: <http://www.neatpumps.com/news/the-uks-first-water-source-heat-pump-for-district-heating-unveiled-at-euroheat-power-congress.aspx>

**28. What could be done, apart from subsidies, to encourage new approaches? Are there any approaches that have worked particularly well in other countries and that could be replicated in the UK?**

Not answered.

**30. What could be done to support a whole-house approach of combining interventions and technologies?**

The Government should set a long-term target for emissions from buildings, similar to the EPC C by 2035 ambition set out in the Clean Growth Strategy. A carbon standard, perhaps based on an EPC's Environmental Impact Rating, would complement the energy efficiency target and give consumers a better idea of the long-term improvements they should be aiming for. The Scottish Government is following suit with a proposal to legislate a target that all households reach EPC C by 2040, which could then be communicated to consumers through the various aspects of the Energy Efficient Scotland programme, including building energy audits.

**Local communities**

**31. How can government best tap into and support community and local authority efforts? Are there any successful examples that can be built upon?**

We believe that local authorities will have a key role to play in raising awareness of clean heating and bringing together consumers and the supply chain in off-gas grid areas. There continues to be low awareness in off-gas grid areas of low-carbon heating. Local Authorities are often viewed as a trusted source of information, and can use this to raise awareness amongst consumers of future changes to their heating systems. Engaging at a community level can help foster acceptance and understanding of future changes. It can also help identify opportunities for cost saving, either through shared systems (like shared ground loops or small heat networks) or bulk buying and installation. A recent pilot funded by the Scottish Government has demonstrated the success of this approach, with 36 privately owned homes and businesses on the island of Iona agreeing to invest in a shared ground source heat pump system. Here, the role of a trusted intermediary and local authority have helped secure greater buy-in from the community, and a community level approach will secure economies of scale<sup>12</sup>. We believe that the Scottish Government's proposal to require local authorities to produce local heat and energy efficiency strategies (LHEES) will create a suitable platform to identify and implement such strategies. Local Authorities will be required to zone areas by suitable low-carbon technology; 'oil-free' zones could therefore be designated within which community engagement programmes could be run to support uptake.

**32. What could be done to drive action from local planning? What are the pros and cons of approaches that rely on local planning? What evidence is there that such approaches produce desired outcomes?**

There is limited evidence that local planning can drive the switch to low-carbon heating in off-gas grid areas. Although local authorities in Scotland can make requirements of new developments, in practise few do due to a lack of any over-arching target or requirement to ensure that new buildings are low-carbon. Even where more stringent requirements are in place, local authorities report that

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<sup>12</sup> <http://scene.community/blog2/iona-6-hats-workshop>

they will come under pressure from developers to lower these or face losing out to jurisdictions with lower regulations.

**33. Do local approaches provide a possible model for delivering a firm end to fossil fuel installations through regulation? For example, by establishing oil free zones starting where it is most deliverable, and joining them up over time.**

Yes – we believe that the Scottish Government has an opportunity to test the establishment of oil-free zones with the introduction of LHEES (see our answer to question 31).

#### **Consumer awareness**

**34. How can we increase consumer awareness and interest in clean heating technologies?**

Consumers must be targeted in a number of ways: general advertising at a national level; local authority level interventions (as suggested in our answer to question 31), obligations on suppliers and installers of high-carbon heat to offer information about low-carbon alternatives. A strong regulatory driver will also help drive awareness.

**35. What are the best methods of engaging directly affected consumers?**

Not answered.

**36. How can we best work with heating engineers to benefit from their knowledge and experience, and their access to customers?**

#### **Sector skills**

**37. What steps are needed to ensure installers, manufacturers and the entire supply chain have access to new skills frameworks?**

The market for training in low-carbon heat has shrunk over the last few years as the market has slowed. Increased uptake will require additional training resource, and should come with a level of demand certainty. Some smaller installers have had negative experiences after seeing little new work from low-carbon heat after following training.

**38. What should the respective roles be for the fossil fuel market and the low carbon heating market in ensuring installers have the skills they need for the future?**

Not answered.

#### **Other questions**

**39. What other options should we be considering to target key barriers to taking up clean heating?**

**40. What intervention would make the biggest difference ahead of any regulation?**

Incentives and subsidy will ensure that the retrofit low-carbon heat market continues to operate. The higher capital costs of clean heating systems puts off many consumers and therefore some financial help in through an incentive or access to finance remains key to unlocking private investment.



## New build

### **41. Why is oil being installed in some new buildings currently? Are there particular factors or characteristics that are leading to oil being chosen over lower carbon alternatives? What are the barriers to installing a clean heating technology in these buildings?**

It is cheapest and easiest to install low-carbon heat in new buildings and today roughly 20% of new buildings are fitted with low-carbon heat in Scotland each year. To ensure that the market continues to grow and to provide opportunities for cost reduction and supply chain expansion, building regulations in Scotland and the UK should be further tightened to ensure that no new buildings are built with fossil fuel heating systems. In off-gas grid areas this would drive the adoption of heat pumps and biomass boilers and in on-gas areas heat pumps or district heat networks could be specified (or where not available, homes could be made district heat ready). This should enter force by 2021 to provide some long-term certainty of volume to the supply chain as the RHI comes to an end that same year. Such standards should be set at a national level rather than relying on local planning authorities, as otherwise in practise developers will seek out lower regulation jurisdictions, encouraging a race to the bottom.

### **42. Do you have any evidence of the cost of retrofitting clean heating in current new build, compared to the cost of building to that standard now?**

Evidence from our members indicates that it is significantly cheaper to install low-carbon heating in new buildings than to retrofit to existing buildings. The thermal performance of new buildings makes them highly suitable for heat pumps and low temperature heat networks, which could help drive down the cost of district heating. The market for low-carbon heat in Scotland has begun to grow following 2015 updates to building standards, and it is estimated that around 20% of new homes are built with heat pump systems. Developers also report that for larger new build housing developments it is possible to engineer district heating systems that provide heat at a competitive cost; these have often not been taken up due to reluctance on the part of housing developers to install an unfamiliar technology.

### **43. What are the relative costs and benefits of installing clean heating systems in new build compared to installing futureproofing measures?**

Not answered.

### **44. What would be the most cost-effective and affordable measures to decarbonise new buildings? Please make reference to specific forms of clean heating or futureproofing measures.**

In off-gas grid areas the most cost effective measure to new buildings will likely be electric heat pumps, biomass boilers and solar thermal. In on-gas grid areas, electric heat pumps and district heat networks will be lowest cost.