12/01/2022

REA Response:

Phasing out the installation of fossil fuel heating systems in businesses and public buildings off the gas grid

The Association for Renewable Energy & Clean Technologies (REA) is pleased to submit this response to the above call for evidence. The REA represents industry stakeholders from across the whole heat sector and includes dedicated member forums focused on green gas, biomass heat, biomass power, renewable transport fuels and energy from waste (including advanced conversion technologies). Our members include generators, project developers, heat suppliers, investors, equipment producers and service providers. Members range in size from major multinationals to sole traders. There are over 500 corporate members of the REA, making it the largest renewable energy trade association in the UK.

The proposals

1. **Do you agree with the principle of using the natural replacement cycle to phase out the installation of fossil fuel heating systems in non-domestic buildings off the gas grid? Yes/No. Please explain your response.**

We agree that the natural replacement cycle is in principle a useful method for phasing out the installation of fossil fuel heating, however, we believe it should be combined with a future hard stop date and consideration given to other useful critical points in a buildings life cycle that heating replacement might take place, such as business renovations or refinancing. It must, however, be noted that the natural replacement cycle could prove difficult to enforce: some fossil boilers are able to last 20-30 years, meaning fossil boilers being installed now could last until 2050. Furthermore, fossil boiler breakdowns are likely to be in business stress situations, where the business priority is to get them up and running again as quickly as possible, rather than making the changes that might be needed for installation of the renewable heating system. BEIS needs to consider that the time to replace a fossil heating system with a commercial heat pump may include 3-4 weeks for planning and design and 12-14 weeks for equipment. Additional time and cost should be considered for any energy efficiency upgrades and electrical upgrades required to ensure the heat pump is running efficiently.

Without a hard stop for fossil fuel installations, it will be impossible for the government to meet its proposed 2040 decarbonisation target. Enabling and encouraging business to transition at multiple points in a building life cycle may enable them to plan better for transition to renewable heating systems.

Changing the heating type requires very careful design and planning (not to mention considerable capital investment), and it is not something that should be done in a rush. In the absence of any economic driver for change, a 'hard stop' by when all fossil fuel boilers must have been replaced with low carbon alternatives, combined with earliest phasing out dates in line with the natural replacement cycle, is the only effective policy. It must be published far enough in advance to allow businesses to plan the change.

Along with the introduction of such a principle, the Government must also urgently address the major policy gap around the support for industrial and commercial heat decarbonisation. There has been no equivalent scheme to support business to transition heat systems since the closure of the Non-Domestic RHI in March 2021. While a few specific grant mechanisms exist, they are not appropriate or accessible to most heat decarbonisation projects, as compared to eligibility under the RHI, and whilst grants can help with upfront capital costs, they don't address ongoing operational costs. The REA would like to see the introduction of a fuel switching tariff or heat

related CfD, to enable industrial and commercial sites to take the active choice to change their heating arrangements.

We should also note the REA supports the deployment of energy efficiency improvements to reduce a businesses/home energy demand along with the installation of renewable and clean technology systems. This should also be prioritised within any policy looking at decarbonising off gas grid buildings.

Timelines for implementing the proposals

2. **Do the 2024 and 2026 timescales for introducing this policy provide sufficient lead in time for non-domestic off-gas grid consumers to prepare for their transition to low carbon heat? Yes/No. Please provide evidence to support your response where possible.**

The REA are supportive of seeing the introduction of the principle of natural replacement cycles to phase out fossil heating. However, given the state of industry and the lack of significant policy to help decarbonise commercial and industrial heat, the suggested timescales are seen as highly ambitious, particularly the 2024 date for larger scale businesses. As such, the introduction of these timescales must be accompanied by equally ambitious policy support under which all businesses are supported to make the transition. This will help secure the skills, supply chains and business confidence required to make the suggested timescales implementable.

Despite the support mechanisms listed on page 15 of the consultation, it remains the fact that the vast majority of businesses are not eligible for support following the closure of the non-domestic RHI in March 2021. As such, the non-domestic renewable heat sector is currently stagnating. and in some cases, contracting. This undermines the ability of industry to meet the suggested timescales. The REA favour the introduction of a fuel switching tariff, as recommended by the CCC, in order to enable businesses to commit to renewable heating systems and secure a growing renewable heat industry. The introduction of a heat CfD would also help compliment this and support the decarbonisation of larger industrial heat applications.

3. **Would an implementation date of 2024 (for large buildings) and 2026 (for smaller buildings) provide sufficient lead in time for industry to prepare for the increase in demand? Yes/No. Please provide evidence to support your response where possible.**

While agreeing strongly with the principle and aims, some members have raised a concern that large buildings often have complex heating needs, with systems requiring long-lead times for implementation. We support the 2024 date for larger buildings, but we heavily stress this will only be possible if:

1) Government can move quickly to provide industry with enough time to prepare.
2) Supply chains are confident and ready.
3) It is accompanied with ambitious policy support that supports business and industry in decarbonising their heating systems, such as a fuel switching tariff or heat CfD, as previously explained.

4. **Do you agree with our proposal to introduce this policy for the largest buildings first? Yes/No. If not, please explain your reasoning, using evidence to support your response where possible.**

No, as described in answer to question 3, we would support the 2024 date encompassing all properties regardless of size. Following the caveats outlined in question 3.

Proposed low carbon technologies

5. **Do you agree with our proposals to take a heat pump first approach to the replacement of fossil fuel heating systems in off-gas grid non-domestic buildings? Yes/No. Please explain your response.**

No, we believe all renewable heating technologies should be considered, ensuring that the right technology is installed in the right situation. This includes but is not limited to: biomass boilers and CHP plants, boilers that use bioLPG, vegetable oil/biodiesel, HVO or other renewable heating liquid fuels, on-site biogas and on-site biomethane (or supplied by road), geothermal (likely via heat networks), energy from waste, hydrogen, thermal energy storage, heat pumps and hybrid pumps, and also heat networks powered by low carbon heat sources.

The REA strongly supports the roll out of heat pumps, and recognise they are likely to play a critical role in many off-gas grid businesses, however, it is important to recognise they may not be the suitable solution to all situations. Rather than a heat pump first approach, we would prefer to see businesses empowered and informed through independent advisors, able to consider a wide range of factors, to consider what the right technology solution is for them, whether a heat pump or something else.

For example, the history of the Non-Domestic RHI has demonstrated that in many situations where high and varying heat loads are required, such as hospitals, schools, council officers or innovations in district heating, technologies like biomass have proven the most suitable decarbonisation option and providing the best value for money. In other situations, in similar buildings, high heat load heat pumps have also been used successfully. However, a complete range of factors need to be independently considered to ensure the right technology is installed, rather than preferring one technology over others.

It is important consumer choice is respected and consumers have a wide range of renewable heating technologies to choose from. Government should not be forcing people down a particular renewable technology, instead the government should support the right technology for the right situation through a technology agnostic policy.

6. **Do you agree that most non-domestic off-gas grid buildings will be suitable for a heat pump? Yes/No. Please provide evidence to support your response, including examples of situations where the heat and hot water demand could not be met by a heat pump.**

There is no doubt that heat pumps will have a critical role to play in helping to decarbonise a large number of off-gas grid buildings being used in business and industrial sectors. However, a wide variety of factors need to be independently considered in order to ensure that the most efficient and cost-effective solution is installed, whether a heat pump or something else. Aspects property owners should consider in regards to all renewable heating systems include space, power grid connection, availability of local installers, level of insulation and building upgrades required, and the capacity of the property for large electric radiators, amongst other factors.

A high proportion of non-domestic buildings are poorly insulated and their heat demands are extremely varied (not just space heating, but hot water and process heat). Heat pumps operate best with low output temperatures which simply will not be adequate for many existing heating systems. There is also a significant issue with electrical grid capacity in rural areas.

For example, in some situations the retrofitting of the ideal underfloor heating required for heat pumps in large non-domestic buildings may be extremely expensive and alternative technology solutions may prove a better fit to the consumers' needs.

7. **What types of buildings are likely to fall into the 'hard to treat' category? Please provide evidence to support your response.**

Typically, hard to treat buildings include those that require particularly high heat loads and/or irregular heat demands, typically relating to a particular industrial process or consumer need. This may also be the result of the building having poor energy efficiency, which may itself be difficult to treat due to the age or design of the building. They may also be in areas with poor grid capacity, where the additional demand from industrial scale heat pumps may be challenging to meet. A wide variety of external factors, such as local availability of installers or easy access to biogenic feedstocks, also mean that electrification may not immediately be the most suitable solution.

Please see attached case studies (annex 1), for examples of where alternative bioenergy renewable heating solutions are used to address hard- to -treat business and industrial heat applications.

8. **What low carbon heating systems do you foresee being used as alternatives to heat pumps in 'hard to treat' buildings? Please provide evidence to support your response.**

There are a wide range of technologies that might well have a role to play in hard-to-treat buildings, especially those associated with industrial or commercial applications requiring high heat loads or variable demand. Further technologies that can play a significant role:

- ***Biomass Heat***

Biomass boilers provide the largest contribution under the RHI to heat decarbonisation in the UK today. They are effective in replacing oil boilers in existing buildings and are a crucial technology for powering heat networks. In Sweden over 40% of heat is met via biomass [1]. Biomass is a versatile alternative where electrification may not be possible, they are particularly suited to contexts where a high heat load is required and/or where levels of energy efficiency are low, typically in off-gas grid rural areas and certain on-grid urban areas (e.g. district heating). There is also potential in urban areas with larger residential or commercial sites, such as schools and hospitals or in new developments combined with heat networks.

- **Deep Geothermal**

Deep Geothermal provides baseload dispatchable green heat perfectly suited to powering renewable heat networks, as is the case elsewhere in Europe where it is seen as a key technology for decarbonising large conurbation of domestic buildings. For example, the Paris basin region has over 40 geothermal plants feeding district heating networks across the city [2]. While the Non-Domestic Renewable Heat Incentive (ND RHI) has brought geothermal projects close to successful deployment in the UK, Covid-19 related delays means there is now a group of projects that are shovel ready but have not been able to deploy under the RHI.

- **BioLPG**

Biopropane (sold as bioLPG) is already available in the GB market. Biopropane is chemically identical to conventional propane (LPG) so can be blended in any ratio with conventional LPG, allowing a transition to a 100% renewable product. An existing LPG boiler is also a biopropane boiler: minimising infrastructure change requirements, especially in domestic situations. The UK's liquid gas industry has committed to a 2040 100% renewable target.

Sustainability of BioLPG feedstocks

Analysis undertaken by NNFCC [1] demonstrates that a deployment pathway for a full switch from fossil LPG to bioLPG in the UK by 2040 is a feasible solution to support the Government in its ambition to move towards a low carbon economy. NNFCC found that there is significant potential for rapid scale-up of indigenous bioLPG production in the UK, as a co-product of sustainable aviation fuel production at new HVO plants or from establishing gasification and fischer tropsch synthesis facilities. Examples of feedstock which will be available to support UK production of bioLPG include used cooking oil, animal fat, vegetable oil, waste, plant dry matter, sugar and starch. [1]

Hydrogenation of bio-oils can play a critical role in the short term, displacing fossil LPG. Using NESTE's plant in Rotterdam as an example, BioLPG is captured as a by-product. An HVO facility of this size could provide adequate quantities for meeting nearly 5% of the total LPG demand in the UK alone. NNFCC [2] found that a moderate sized HVO site in the UK could be developed utilising circa 540,000 tonnes of UCO and tallow– providing a drop-in solution for kerosene (to use in aviation) and LPG (to use in off-grid heat).

We are also aware that further R&D is being carried out to explore alternative pathways to produce biopropane in a sustainable way. This scientific article [3], recently published, includes

promising results on the production of biopropane from the Decarboxylation of butyric acid, which can be obtained from biomass.

[1] NNFCC, Biopropane: Feedstock's, Feasibility & our Future Pathway (2019)

[2] NNFCC, A business case for an indigenous BioLPG supply chain in the UK (2021)

[3] Jude A. Onwudili et al. Optimisation of Propane Production from Hydrothermal Decarboxylation of Butyric Acid Using Pt/C Catalyst: Influence of Gaseous Reaction Atmospheres (2022).

- **Renewable DME**

rDME is a sustainable, ultra-low carbon fuel and energy carrier produced from a variety of renewable sources, including municipal solid waste, forest residues, sewage waste and animal waste. It offers simple and significant opportunities across many industries to enable a partial or complete transition to sustainable, low-carbon, low-emission energy by itself, blended with LPG, or to carry energy from other sources. The LPG industry is investing heavily to bring more rDME to market including constructing new advanced gasification plants in the UK, using UK patented technology.

- **Thermal Heat Storage Batteries**

BEIS must also consider the role of thermal battery energy storage which can be used to efficiently store waste heat from industrial processes, shifting and reducing demand in commercial heat uses, as well as helping make district heating projects more energy efficient. They can be charged using excess process heat, or directly from heat pumps, ground-source heat pumps, biomass boilers and photovoltaics. At the domestic scale, up to ~12kWh, they can be used to make buildings on a heat network more energy-efficient, sustainable, and self-sufficient. At the utility-scale, large scale static or transportable heat storage (200 kWh to multiple MWh) is also possible, helping to use heat where, and when, it is most needed. With the transition to a greater decentralised energy system and a need to spread out heat demand, especially on the electricity grid, thermal storage is likely to play a crucial role in enabling heat decarbonisation both in the domestic and non-domestic sector.

- **Biogas, Syngas and Biomethane**

Anaerobic digestion has been successful in replacing the fossil fuel heat required in commercial and farming operations that already have access to significant levels of biogenic materials, typical as a waste by-product of another industrial process or farm residues. The use of onsite biogas, or biomethane (either produced on site or delivered by road to farms or factories that don't have access to the gas grid) is effective in decarbonising farm buildings, onsite drying or other manufacturing processes (such as in food and drink manufacturing). It can also meet the households, neighbours and agricultural workforce's own households' demand for renewable heat (as both, heating and hot water supply), whilst delivering numerous additional environmental and agronomic benefits, such as the application of biofertilisers to agricultural land to replace chemical fertilisers. Similar potential is also seen in the use of on-site syngas generation where gasification and pyrolysis systems are used on waste or biomass feedstocks. There is an opportunity, and significant interest, in AD and advanced conversion technology projects, especially in the agricultural and food manufacturing sectors where it is in creating added value.

Where individual farms or food factories have no access to the gas grid, they are not being incentivised to invest in converting their process residues into bioenergy (as is being done by Brewdog).

The food and beverage sector has typically significant volumes of on-site residues / effluents that need treating, and also significant requirements for process heat (and in some cases power), as

well as haulage fleets for materials supplies and product distribution all of which need decarbonising (including diesel HGVs). An on-site anaerobic digestion system deployed at these factory or farm processing sites could make use of these residues / effluents, whilst providing part of the heat and power requirements for the beverage or food manufacturing process - especially within processes that have a significant heat requirement (distilleries, breweries etc.). It can also produce biomethane to fuel their fleet (both for product haulage and delivering inputs and raw materials).

WRAP (2018) estimates that food manufacturing produces 1.5 Mt of food waste per year, with 6,700 SME's accounting for 97% of businesses. Members of the REA estimate that 100 of these (1.5%) with on-site AD producing 100 m3 of biogas, each generating circa 4 GW of heat per year (or 1.8 GW electric and 2.2 GW heat in a CHP), could supply 400 GW per annum of clean heat or over 30,000 tonnes of low emissions, decarbonised HGV fuel.

A source of funding becomes essential to support the business case for an on-site biogas/biomethane plant. Significant capital investment is needed up front to build the AD plant, the biogas CHP/boiler and/or the biogas upgrade equipment, biomethane fuel utilisation and potential CO_2 capturing infrastructure. The Green Gas Support Scheme (GGSS) does not support these types of projects and should be addressed by the Government policy to incentivise industrial decarbonisation.

- **Hydrogen (onsite or delivered by road)**

Hydrogen is a carbon free energy carrier with the potential to decarbonise challenging sectors (e.g. industrial clusters, heating and transport - in particular aviation, marine and heavy freight). It can also be used for large scale energy storage. Hydrogen has zero emissions at the point of use, but its upstream or "well to tank" (WtT) emissions vary considerably, depending on how it is made.

Industrial users are likely to be early adopters of hydrogen for a number of reasons, including but not limited to the following: industrial end users are likely to have fewer cost-effective alternative decarbonisation options. In addition, it is also easier to convert to hydrogen a large appliance (e.g. a large boiler) than many small appliances, and the transportation of hydrogen is also easier to address (e.g. when the SMR plant can be built next to the industrial user).

Hydrogen is likely to play a key role in decarbonising hard-to-abate industrial sectors such as steel, ammonia, refineries and chemical plants, where other decarbonisation options such as electrification or bioenergy are not available. Hydrogen can either be used as a fuel to produce industrial high temperature process heat (e.g. in cement production), as a feedstock/chemical reagent (e.g. in ammonia or methanol production) or as a reducing agent in the production of direct reduced iron (DRI) (steel).

[1] Werner (2017) District heating and cooling in Sweden, https://www.sciencedirect.com/science/article/pii/S0360544217304140?via%3Dihub

[2] EGEC Geothermal (2019) Geothermal Energy Use, Country Update for France, http://www.afpg.asso.fr/wp-content/uploads/2019/06/EGC-2019-Country-Update-For-France.pdf

[3] Frontier Economics (2020) Business models for low-carbon hydrogen production, https://www.frontier-economics.com/media/4157/business-models-for-low-carbon-hydrogen-production.pdf

9. **Will these alternative low carbon heating systems align with the net zero, sustainability, air quality and consumer experience criteria set out as bullet points in the 'Alternative low carbon systems' section? Please provide evidence to support your response.**

Yes, these are recognised as renewable heating technologies under existing policies such as the RHI. Biomass Heat, for example. is already done in accordance with strong sustainability governance arrangements.

The UK's bioenergy sustainability governance arrangements are regarded as one of the most comprehensive frameworks in the world. All government bioenergy support schemes have associated regulations and reporting requirements that must be fulfilled. This includes considering land use change, biodiversity, and overall lifecycle GHG emission calculations. Use of virgin biomass is also subject to The UK Timber Standard[5] which sets criteria across a range of social, economic and environmental metrics, reflecting proper forestry practice and are based on internationally agreed principles.

Biomass fuels used for heat production under the RHI must be registered against the Biomass Suppliers list or Sustainable Fuel Register. Much of the industry uses independent voluntary certification schemes, such as EN Plus or Woodsure, to audit and assess supply chain practices to ensure they not only meet, but go beyond, national sustainability requirements.

The REA recognises the importance of strong air quality controls. In relation to biomass boilers these are best implemented through strong fuel and maintenance standards along with the mandating of high-quality flue gas filters. These are mature technologies that are readily available. Where tighter emission and maintenance standards are put in place, biomass boilers meet emission levels that cause no issues for urban air quality. It is also important that the government doesn't treat all rural areas as the same, and recognises there are some rural areas where air quality can become a real issue, where it is just as important that standards are maintained.

That being said, if the government believes it too difficult to mandate such standards on domestic properties, and decide an urban ban is appropriate, then this must not set a precedent for all biomass installations. Biomass, due to its ability to meet higher and varying heat loads, has a particularly strong role to play in commercial applications, including public sector buildings such as hospitals, schools, public swimming pools, council offices and innovation in district heating schemes. The RHI has also demonstrated that biomass provides the best value for money of any technology at these scales, averaging £463/ kW across the range of biomass tariffs in the Non-Domestic RHI - half that of any other technology. Such buildings are, however, commonly located within on-gas grid areas where an urban ban would unnecessarily block a vital decarbonisation option for such commercial operations.

BioLPG boilers produce low levels of SOx, NOx and particulates and therefore meet high standards for air quality. Sustainability of BioLPG has been assured for the transport sector, where it is currently supported under the RTFO scheme. BioLPG also benefits from being a drop in fuel for existing LPG customers so there is a low disruption transition for businesses.

10. **Are there instances where both heat pumps and alternative low carbon heating technologies will be unsuitable for meeting a building's space heating and hot water demands – i.e., 'untreatable buildings'? Yes/No. If yes, how and when do you foresee low carbon heating technologies developing to overcome these challenges? Please provide evidence to support your response.**

No, there are no instances where a building is untreatable by any low carbon technology. If a building is untreatable by both heat pumps and alternate low carbon technologies. This is most likely a severe energy efficiency or cost issue. Examples could include heritage buildings, but often these buildings can't be made treatable without significant upgrades. The government should be taking steps to ensure all buildings are treatable by some form of low carbon heat. Bio-LPGs are one technology that could be used as a tool to make untreatable buildings treatable.

The cost of transitioning

11. **How do you foresee the costs associated with installing a heat pump in non-domestic buildings changing over the next 10 years? Please consider a range of system sizes in your response and provide evidence to support your answer.**

12. **How do you foresee the costs associated with installing alternative low carbon heating systems in non-domestic buildings changing over the next 10 years (i.e., other than heat pumps)? Please consider a range of system sizes in your response and provide evidence to support your answer.**

Given the size of the renewable heat market it is difficult to bring costs down at this time, however it should be noted renewable heating has been on a downwards trend in regard to cost. CAPEX prices will decrease once technologies have had time to get established and build expertise. In relation to bioenergy heat technologies, the opportunities for cost reductions are likely to come from development of innovative domestic feedstocks which will both increase availability and reduce reliance on imports. Whilst costs will reduce some members believe the government is being rather optimistic in renewable heat price reduction in this consultation document. Global commodity prices are a key driver of equipment price and retrofit of alternative heating systems is, inevitably, a bespoke business incurring significant labour costs. We do not anticipate labour or commodity prices falling significantly and, therefore, we do not see installation costs falling significantly even if the volume of work rises. The sort of economies of scale envisaged, and which were seen in the solar PV market, are unlikely to be realised.

13. **How can the government support cost reductions in low carbon heating technologies suitable for non-domestic buildings, particularly heat pumps? Please consider buildings of differing sizes and energy use.**

Introducing a technology neutral policy framework for bringing multiple renewable heat technologies to market. This would include Research and Development support, similar to the government's Heat Pump Ready Programme. A technology agnostic research and development grant would be strongly welcomed. Members have also raised that fuel costs remain one of the greatest challenges for renewable heat technologies. Any support government can give in reducing fuel costs would be very welcome, for example through the Net Zero Innovation Portfolio.

14. **How accurate is our indicative modelling for the cost of transitioning to low carbon heat? Please provide evidence to support your response. This should include details on the types of buildings the costs are associated with, including its floor area (m2), energy use (kWh) and the type of heating system it currently uses.**

No comment.

15. **How can we support the green finance market to develop the products and investor demand that businesses will need to fund their transition to low carbon heat?**

Currently, running costs of low carbon heating systems are higher than or equal to running costs of conventional heating systems so there is very little private investment in low carbon heating systems. If a mechanism were put in place to make low carbon heat significantly cheaper than conventional heat, private investment would flow into low carbon heat projects. The non-domestic RHI achieved this in one way – by paying for the heat produced – but this has been ruled out in future so if capital grants are also to be avoided, then some sort of running cost adjustment is needed.

Back-up systems

16. **In what situations are fossil fuel back-up systems common and how frequently are they used? Please provide evidence to support your response.**

A backup heating system of some kind can be common in public sector and community buildings. In many commercial applications, a back-up system is essential e.g. hotels, chicken farms, factories, shops etc. Heating is an enabler for their principal business, not an end in itself. The reason that, to date, many low carbon heating systems have fossil fuel back-up systems is that they are the cheapest form of heating to install (and in many cases, pre-existing fossil fuel systems are retained as back-ups). If running costs of fossil fuel heating systems are lower than the 'low-carbon' alternative then, very quickly, the 'back-up' system will become the primary

system. It is therefore more important than ever that, if fossil fuel back-up systems are allowed, the running costs of fossil fuel systems must be higher than those of the low carbon 'primary' heat source.

In the agricultural sector, for example in poultry farming and animal rearing, maintaining the correct temperature is important for animal welfare so back-up systems may be needed. This isn't usually the case for LPG and BioLPG systems, which are sometimes used to back up less reliable systems.

As back-up systems are used infrequently, we question the need for them to be subject to the same stringent emissions standards as the principal heating system, as this would impose undue costs on businesses and the public sector.

17. **What low carbon back-up solutions are available for buildings with a heat pump as their primary system? Please provide evidence to support your response.**

In some cases alternative renewable heating systems could be used as an alternative to a heat pump through a hybrid system. This could include a biomass boiler running from wood chips, or a solar panel leading to a solar thermal network within the property.

The use of bioLPG in a hybrid heat pump set up can significantly reduce the size of the heat pump required as the heat pump does not need to meet peak energy demand. This has additional benefits of reducing the strain on the electricity grid during times of national peak heat demand and providing 2 systems to help with back up.

Consumer protection

18. **Taking into consideration existing certification schemes, are businesses adequately protected when installing a low carbon heating system up to 45-kilowatts? Please provide evidence to support your response.**

Yes, existing renewable heating certification schemes and regulators such as Ofgem, MCS, and REAL provide adequate protection for businesses when installing low carbon heating under existing support schemes. However, the regulations must continue to require certification to protect consumers in new support schemes and regulations, as if this is not enshrined in legislation it may open the door to less reputable, new entrants.

19. **Do businesses that install low carbon heating systems with a capacity over 45-kilowatts require consumer protection? Yes/No. If Yes, how should this differ from standards available for installations up to 45-kilowatts?**

No comment.

Managing compliance

20. **Do you have any views on how best to ensure compliance with the proposed regulations laid out through this consultation? Please provide evidence to support your answer.**

It will be very difficult to police individual businesses. Members are concerned around relying on Councils' Building Controls to enforce this, as in reality it becomes a self-enforcement mechanism. Members believe that a system can rely on individual self-enforcement to a certain extent but local authorities are too overstretched and under-funded to ensure proper compliance. Our members would support compliance via positive enforcement such as a grant towards low carbon heating that increases the more efficient the technology you use. This would incentivise businesses to put in the best possible low-carbon heating technology.

Important lessons were learnt during the Non-Domestic RHI, which over time saw standards slowly tightened around installation, fuel and maintenance practices across all sizes of project. It is critical that these lessons are taken forward and maintained for all forms of renewable heating technology to avoid poor consumer installation which could undermine public confidence in heat decarbonisation technologies. It is worth noting that there is serious industry concern that so far these lessons are not being maintained, as demonstrated by the design of the Boiler Upgrade Scheme, which provided no ongoing requirements around standards.

Other trigger points to reinforce the policy

21. **What is the typical lifespan of a non-domestic heating system used in an off-gas grid building? How does this vary by system capacity? Please provide evidence to support your response, which should include the type and size of heating systems.**

An average lifespan would be 10-15 years but systems have operated for over 30 years in exceptional cases. Lifespans can vary by a number of years depending on size, complexity, availability of spare parts and maintenance, so this average could change wildly from case to case.

22. **What are the potential implications for businesses of introducing an end date by which all buildings must have transitioned to low carbon heating (e.g. in the early 2040s)?**

Implications could include costs related to not only upgrading the heating system but making the necessary refurbishments to make said system effective. Other implications could be training staff in safely operating the new heating system.

However, overall, the REA are in favour of a clear market signal being given through a strong end -date that makes clear when business will have been expected to have made the transition. This will focus minds and, provided it is far enough in advance, should give businesses time to plan the transition. Without a 'hard stop' on fossil fuel heating systems, many will never make the change.

23. **What are the potential implications for businesses of introducing trigger points for installing a low carbon heating system, in addition to the natural replacement cycle, such as at the point of let or sale?**

Implications could include additional costs at the point of sale as well as other general inconveniences coming with heating upgrades. There is a risk that without a backstop businesses replace their fossil heating system with a new cheap fossil fuel heating system to avoid being caught in the policy. A trigger point at an inconvenient time could also bring a lack of activity and competitiveness for the business. There are also concerns around the welfare of livestock on farms should heating fail suddenly and farms have to engage in a lengthy heat retrofit.

Equality Act 2010

24. **Do you have any evidence on how groups protected under the Public Sector Equality Duty may be affected by our proposals to phase out high carbon fossil fuel heating in nondomestic buildings off the gas grid?**

No comment.

25. **Do you have any views on what more could be done to ensure businesses and communities affected by our proposals experience a smooth transition to low carbon heat? Please provide evidence to support your answer.**

No comment.

Other

26. **Please use this space to provide any further views not already captured in your responses to the previous consultation questions**

It is clear that some form of grant or low cost funding will be needed to deliver this policy whether at property trigger point or at a backstop date, given the other strains on businesses at this time, so this policy can only work in conjunction with effective financing options. Without a mechanism to make low carbon heating financially attractive, no targets will be hit and businesses will leave everything to the last possible moment leading to some sort of crisis and, most importantly, failing to abate carbon emissions early.