# REA Response to Scottish Government consultation: Heat in Buildings Strategy – Achieving Net Zero Emissions

The Association for Renewable Energy & Clean Technology (REA) is pleased to submit this response to the above inquiry. The REA represents a wide variety of organisations, including generators, project developers, fuel and power 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. Of particular relevance to this inquiry are the following Member Forums of the REA: Wood Heat Forum, which includes our biomass heat members; Green Gas Forum, which includes green gases such as biomethane, clean hydrogen and biopropane, as well as our Waste to Energy, Solar and Energy Storage Forums.

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**Answers to specific questions**

**Chapter 2 – A 2045 Pathway for Scotland's Homes and Buildings**

1. To what extent do you support the pathway set out for achieving the 2045 net zero target and the interim 2030 target?

We are very supportive of the ambition to have a zero-emissions heating system in almost all buildings by 2045, as well as the targets around reducing energy use. The interim target, to have a zero-emission source of heat in 50% of homes and 50,000 non-domestic properties by 2030 is also an important step.

The REA, in our recent Strategy for Net Zero, set the ambition that heat demand is entirely renewable by 2050 across the economy, with a 2035 target for renewable and low carbon heat to be the dominant form of heat.

In our view, early action, particularly in the 2020s is vital to achieving this, so we welcome the pathway set out in this document around improving energy efficiency in tandem with encouraging low and zero carbon heat installations.

You can find a copy of our Strategy and key recommendations to reach the above targets for heat in the Annex 1 to this response.

3. **What are your views on our assessment of strategic technologies in low and no regrets areas to 2030?**

The decarbonisation of heat is vital to reaching net zero, through deployment of renewable and clean technologies, in combination with reducing demand through improved energy efficiency.

Decarbonising heat requires a multi-technology approach. As identified within the consultation, electrification will be of strategic importance to decarbonise heat in most situations, but it will not be the only solution given the heterogeneity of dwellings, the infrastructure they rely upon (water, energy, transport, internet) and the diverse needs and behaviours of property owners and users. As such, the Scottish Government Heat in Buildings Strategy must prioritise the best technology for each situation, developing a resilient policy approach that recognises there is no 'one size fits all solution'.

We welcome the further analysis being undertaken by the Scottish Government on solar panels and thermal and battery storage.

A wide variety of factors must be considered when selecting the right technology including, but not limited to:

- levels of energy efficiency,
- energy usage activities within the building (including process heat),
- local infrastructure for that heat source (including power and gas grid and feedstock availability),
- Ability to supply a renewable power supply, either imported from the grid or via on-site generation.
- Ability to store either electrical or thermal energy.
- Further electricity demands being placed on the building, including EV charging.
- the level of carbon savings provided by different solutions
- available indoor and outdoor space constraints
- key technologies expected to play a role in heat decarbonisation Include:

We have listed below the key low-carbon heating technologies that are strategic to decarbonise heat.

**Heat pumps**–The electrification of heat is expected to play a prominent role in new builds, especially in high energy-efficient properties. They may also play an important role in energy-efficient off-gas grid properties. Consideration will, however, need to be given to the increased electricity demand on some localised grid infrastructure, especially when combined with an increasing number of electric vehicles.

**Biomass** –a versatile alternative 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. There is also potential in buildings with larger residential or commercial sites, such as schools, hospitals, and offices or in powering heat networks. Utilising biomass is also particularly efficient where there are significant capacity or grid connection cost constraints. Industrial process heating will also be needed to be considered in the Heat in Buildings strategy, where biomass can provide an immediate solution for decarbonising commercial heat use. As biomass is already the largest current contributor to non-domestic renewable heat it must not be ignored within the strategy.

**On-site biogas/biomethane** - Renewable heat generated from the combustion of biogas or biomethane produced from anaerobic digestion or thermal gasification can also replace the fossil fuel heat required for non-domestic buildings such as farm or food manufacturing buildings, warehouse, commercial dwellings or heat networks, whilst delivering numerous additional environmental and agronomic benefits. There is an opportunity in these sorts of projects in the agricultural and food manufacturing sector where they create added value. This route can be pursued as an option where there is a workable feedstock supply.

**Directly piped or tracked biomethan**e – Projects that use a 'private-pipe'/direct connection or tracking by road of biomethane to buildings, where the gases supplied are 100% biomethane, should also be an option.

**Hybrid systems** - green gases or renewable heating fuels combined with heat pumps also allow for the installation of lower powered heat pumps in localities where there are constraints on the electricity network (where grid connection costs prove to be high) and switching to green gas when electricity prices are high.

**Hydrogen** - Hydrogen has a role to play in decarbonising heat, though should target dwellings and buildings where electrification or already established bioenergy options are not possible or cost-effective. Hydrogen should only be supported if the production pathway is sustainable, such as produced from electrolysis powered by renewables sources and biohydrogen. We also recognise that Blue Hydrogen may have a role but only where carbon capture and storage is used and the carbon fully captured.

It is also important that an appropriate tracking methodology is adopted to ensure each unit of clean hydrogen can be tracked from its point of injection to the point of its sale to a customer. Guarantees of Origin (GoO) or other similar certificates can provide tracking of green gases according to either a book and claim or mass balance methodology.

**Direct electric heating** - A building developer may consider direct electric heating where overall heat demand is so low that the cost of installation of an alternative renewable heat system would be prohibitive compared to demand and resulting bills.

**Biopropane - Biopropane (sold as bioLPG)** is already available in the GB market and, like biomass provides an alternative where electrification isn't possible. Biopropane is chemically identical to conventional propane (LPG) so can be blended in any ratio with conventional LPG, allowing a smooth transition to a 100% renewable product. The UK's liquid gas industry has committed to a 2040 100% renewable target.

As the draft strategy outlines, there are 167,000 off-gas grid properties in Scotland and a technical feasibility study commissioned by the Scottish Government and undertaken by Element Energy has assessed that approximately 60,000 off-gas grid properties are not suitable for electrification via heat pumps, requiring a bioenergy solution, such as

bioLPG. It's important there are affordable low carbon options for all properties, especially given the UK government's policy to regulate for low carbon heating in homes off the gas grid before homes on grid.

**Deep Geothermal** - Deep Geothermal provides baseload dispatchable green heat perfectly suited to powering renewable heat networks, as it does in the Paris basin region which has over 40 geothermal plants feeding district heating networks.

**Solar thermal** - Solar Thermal provides baseload water heating which may be most suited to domestic or commercial settings with high energy efficiency levels, or low heating requirements.

**Heat Batteries** – provide thermal energy storage for industrial & commercial buildings, social housing and private homes. They can be charged off the grid or used in conjunction with technologies green heat technologies, to prevent heat loss and enable heat to be saved, stored and reused. These can help to minimise peak energy usage, reduce demand charges and generate new revenue streams from DSR programmes.

**Grid delivery of biomethane** - Sourcing green gas from the grid should also be included as an option to decarbonise existing buildings where other solutions are not viable. Under this scenario, it is also important that an appropriate tracking methodology is adopted to ensure each unit of biomethane can be tracked from its point of injection to the point of its sale to a customer. Guarantees of Origin (GoO) or other similar certificates can provide tracking of green gases according to either a book and claim or mass balance methodology.

6. Do you agree that a new heat target should apply to heat in buildings, distinct from industrial heat?

We do not have a firm view on them being separate – but would stress that whether they are or not, industrial heat should be given support and inventions to aid in its decarbonisation. Where there are natural synergies between the two, and mechanisms could apply to both, they should do so.

**Chapter 5 – Preparing our Energy Networks**

28. In your view, is there further action that can be taken to ensure that our electricity systems are ready for heat decarbonisation? If yes, please provide further information.

A significant drive towards the electrification of heating will put more strain on the electricity grid. In order to manage this, any new demand for electricity driven by electrification of heating should be matched with new low carbon generation. Upgrades to the electricity grid must be made to ensure increased power demand from individual households is met.

We would also encourage the Scottish Government to look at other upgrades that may need to be made to existing infrastructure, for instance three phase electricity supply in homes, which may be a necessary upgrade. There is work ongoing by the DNOs on this, including UK Power Networks who are working with customers to make it easier to let the operators know that if they have installed a heat pump that may increase the electricity need.

There could also be a strong role for hybrid systems, which use a heat pump most of the time, but then switch to gas or other fuels during stress periods.

Grid delivery of renewable gas should be recognised by policy makers as a route for decarbonising gas consumption in both the voluntary and regulated sectors, especially where other low-carbon options are not viable. In this scenario, the chain of custody between producer and consumer must be tracked through a robust methodology, such as Guarantees of Origin.

There is a large amount of work still to be done in this area so we are supportive of the Scottish Government's commitment to undertake more work in 2021-22 into network investment costs on greater electrification of heat and impact on the grid.

31. What are your views on the changes set out above for the gas networks?

We are broadly supportive of the changes set out by the Scottish Government for the gas networks and we would be happy to engage with the Scottish Government and help inform these changes. Our Green Gas Forum represents around 200 companies involved in the development and operation of biogas and biomethane plants in the UK, and companies in the biogas/biomethane supply chain. On behalf of our members, we have been closely involved with BEIS on the development of the Green Gas Support Scheme (GGSS) and are very supportive of this scheme, which will support further decarbonisation of the gas grid. We are also planning to engage on discussions with BEIS around a longer-term mechanism for green gases following the closure of the GGSS.

We have recently formed a Hydrogen working group to play a more active role in shaping the near-term and long-term future of low-carbon hydrogen in the UK and we have several members involved in the development of low-carbon hydrogen projects or the hydrogen supply chain.

It is worth noticing that we have recently submitted to BEIS some initial policy recommendations to help kick start the development of clean hydrogen in the UK.

We note the consultation refers to 'clean' hydrogen and 'green' hydrogen. It is important that the Scottish Government does not only focus on blue and green (electrolytic) hydrogen but that a technology neutral approach is taken, as long as the hydrogen meets high carbon standards. The production of biohydrogen – either from steam

methane reforming of biomethane or from thermal gasification of biomass – should not be overlooked as it can deliver zero or even negative GHG emissions.

The REA has already approached BEIS officials to organise a roundtable with members to discuss future support for biohydrogen. We would also be happy to engage with the Scottish Government on these hydrogen production pathways which can deliver negative greenhouse gases emissions.

32. Are there further actions that could be taken by government or industry that you think would make the changes set out more cost effective? Please provide evidence to support any suggestions.

Government, with Ofgem and the gas networks, must accelerate the adoption of a revised Billing Methodology that enables biomethane injection into the grid without the need for propanation, which is a substantial cost for the biomethane sector. The adoption of a revised methodology would also facilitate injection of other low-carbon gases into the grid, like clean hydrogen and help hydrogen blending in the network.

The requirement to add propane is estimated to add cost of £150,000 per year for a 500 m3 /hour capacity plant. In addition, propane is fossil based so it increases greenhouse gas emissions of the biomethane.

There is currently lack of focus on the Cadent NIC Future Billing project which would address this issue. This project aims to unlock the gas energy billing framework to deliver all safe low carbon gases without needing to add in costly, high carbon treatments. It aims to continue billing gas customers on the energy that they use. Provided the billing mechanism takes proper account of the day-to-day changes in the Calorific Value (CV) of the gas, the customer should not be adversely impacted.

Government, Ofgem, and the networks should work together in one single project to accelerate the reforming of the Gas (Calculation of Thermal Energy) Regulations (CoTER) and address once for all the propanation issue across all green gases. This should be done as a matter of urgency.

33. What evidence can you provide on the potential for heat networks in Scotland that can help inform a new ambition for deployment within the final Heat in Buildings Strategy?

We believe there are further opportunities for development of heat networks in off-gas-grid areas. There are many towns, villages, and business parks where heat networks would be an effective method of decarbonising heating.

Biomass

One opportunity area is using biomass as the fuel source for heat networks in Scotland.

Rural areas have a far higher rate of fuel poverty than urban areas and so, if given the chance to reduce their heating bills, residents could be very willing to support the installation of heat networks. Northern areas of the UK, such as the highlands, have been identified as potential locations for heat networks as they have a higher base heat load due to colder temperatures. Also, with Scotland dominating the UK's forestry marketplace, there is a clear supply-chain for the woodfuel, with biomass being a key renewable heating technology for running heat networks.

Heat networks fuelled by biomass can provide both a short-term boost to the local economy by providing jobs in the construction of the plant/network and installation of HIUs/heat meters. It can also provide more jobs in operation and maintenance of the network. The need for local woodfuel production retains money spent on energy within the local economy. This, in turn, results in important employment opportunities in local forestry, fuel processing and transport. Also, local woodland is likely to be better managed if it is of increased economic value.

Other opportunities in terms of low carbon fuels for heat networks are biogas, energy from waste and geothermal, as well as clean hydrogen.

Biogas

The renewable heat generated from anaerobic digestion can replace the fossil fuel heat required for farm buildings, onsite drying processes (such as in food production) and the households, neighbours and agricultural workforce's own households heat demand (as both, heating and hot water supply). This has been demonstrated for remote distilleries off the gas grid in Scotland, previously using heavy oil for boilers.

Support for such projects has the additional advantage of providing upstream environmental benefits in terms of waste management and benefits downstream associated with digestate application to agricultural land. Supporting biogas schemes should be considered the optimal use for biogenic wastes, particularly where there has been a separate collection of municipal biodegradable waste that is suitable for recycling or recovery using a managed biological treatment process.

There is an opportunity, and significant interest, in AD and ACT projects, especially in the agricultural and food manufacturing sectors where it is in creating added value. They can also be widely applied as a heat source for a heat network, either through on-site CHP or as biomethane delivered through the gas grid. Again, a local approach should be utilised here and these technologies pursued as an option where there is a workable supply or possibility to develop one near to a proposed heat networks site.

Also, it should be noted that when existing heat network schemes fuelled by natural gas already exist, the options available to decarbonise them are very limited. Where other onsite renewable heat solutions are not possible, UK policy and regulatory framework for heat networks should recognise grid delivery of renewable gas tracked by a

Guarantee of Origin (GoO ) as a method to deliver renewable gas and make progress towards decarbonising communal and district heat networks. Or if Government decided that adaptations to a GoO system were needed, or alternative tracking mechanisms such as a mass balance system were necessary, then they should set out the evidence and reporting requirements that CHP plants / district heating schemes would be expected to follow and give the industry time to develop those tracking methods.

Deep Geothermal

Deep Geothermal provides baseload dispatchable green heat perfectly suited to powering renewable heat networks, as it does in the Paris basin region which has over 40 geothermal plants feeding district heating networks. Whilst there may not be active projects in Scotland, it is certainly an area of interest.

34. What evidence can you provide on the potential for heat derived from energy from waste to qualify as low or zero emissions?

Compared to other European countries, the UK has not yet managed to capture the heat potential of EfW. This is due to several reasons which need to be addressed in future strategies focused on delivering CHP. This includes:

Lack of incentive to develop CHP compared to just doing power. The price of gas and heat compared to electricity is low, making it difficult to build a business case around CHP with public sector support for the 'main' hot water pipeline, prior to spurring off for more local end users.

EfW sites are not typically near residential areas or lack a nearby industrial heat offtake, so potential heat demand is too far away to make it worth transporting, unless Government support is provided for more innovative uses of waste heat. It is worth noting that Defra's Resources & Waste Strategy states under Section 3.2.1 that it wants to see more EfW operate in CHP mode. Many local authorities typically lack the resources to broker and manage the infrastructure development required to facilitate EfW CHP or to deliver local heat networks/main distribution pipes. Current Government support, or further grants, may help address this situation if appropriately focused.

Scottish Government should also be aware of increased interests in Advanced Conversion Technologies, particularly following the introduction of the development fuel sub target within the renewable transport fuel obligation, that utilises gasification and pyrolysis systems with biomass and waste feedstock to produce renewable transport fuels, green chemicals, or further heat and power. Such sites tend to be smaller and more modular than full scale energy from waste plants, so could be better sized to efficiently power smaller district heating systems.

Heat derived from energy from waste facilities are widely regarded as low carbon. On average around 50% of waste arising is biogenic in nature, meaning that when converted to energy it is considered a form of bioenergy with carbon being released as

part of the carbon cycle. Equally further environmental benefits are realised when compared to the counterfactual of seeing waste sent to landfill, where the predominant gas emitted is methane, a green house gas many times worse then carbon dioxide. In addition, energy from waste offers a pathway to bioenergy carbon capture and storage – delivering negative emissions which are identified by the Climate Change Committee and IPCC as necessary for getting to net-zero by 2050.

**Chapter 6 – Kick-starting the Investment in the Transition**

41. What are your views on the role of government funding over the next five years? For example, should it be focused towards significant increases in the volume of renewable heat and energy efficiency measures installed or more targeted at specific priority groups or technologies?

As identified by the Climate Change Committee, heat pumps are of high strategic importance to the decarbonisation of homes. They are a versatile technology and will have a crucial role to play in both on gas grid and off-gas heat decarbonisation.

Similarly, hydrogen has a role to play in decarbonising heat, though should target dwellings and buildings where electrification or already established bioenergy options are not possible or cost-effective. Hydrogen should only be supported if the production pathway is sustainable, such as produced from electrolysis powered by renewables sources and biohydrogen. We also recognise that Blue Hydrogen may have a role but only where carbon capture and storage is used and the carbon fully captured.

However, we would reiterate the point that heat decarbonisation will require a multi-technology approach. The Scottish Government should be strategic in how it allocates its funding, but in doing so it should make sure it still supports the technologies that have helped deliver progress to heat decarbonisation today. Bioenergy is a strong example of this.

43. What are your views on the effectiveness of our existing delivery programmes in supporting different client journeys, including for those in or at risk of fuel poverty? (for example, landlords, home owners, non-domestic building owners – public and private, domestic and non-domestic tenants). In your opinion, are there any gaps in support?

As recognised in this strategy, there are specific challenges for the decarbonisation of the non-domestic and industrial sectors.

With the Non-Domestic RHI having closed on the 31st March 2021, there is a large policy gap for industrial and commercial heat decarbonisation on a UK-wide scale. We are concerned about the 'squeezed middle' that will be created by this policy gap.

For these businesses, they will be faced with strong cost differences between a fossil system and a renewable heat system, both in terms of capex and opex. As this strategy

points out, some businesses will be driven by Corporate Social Responsibility and company policies to decarbonise, yet we urge the Scottish Government to consider broader options to support these sectors.

Scotland has a strong history of providing interest free loans, which is something that could again be applied to the Non-Domestic sector to provide capital for businesses who may otherwise struggle with the capital cost.

We are supportive of the Scottish Green Public Estate Scheme, particularly its intention to provide grants, loans and other revenue funding mechanisms to support heat decarbonisation in the public sector.

**Chapter 10 – Working with the UK Government**

60. To what extent do you agree that the issues identified must be addressed jointly by the UK and Scottish governments to unlock delivery in Scotland?

We broadly agree that the identified issues should be addressed jointly with the UK Government and the Scottish Government can play a crucial role to push the solutions for these issues forward.

We particularly welcome the Strategy emphasis on the role that bioenergy can play in the 'hard to treat' markets and the fact that this represents the only practicable option for certain buildings where electrification is not possible. It is very important that Government clearly recognizes this role.

We also agree with the Scottish Government plan to urge the UK Government to increase the level of funding provided under the Clean Heat Grant. At the moment, this is the only scheme replacing the Renewable Heat Incentive that applies to biomass heat, albeit to a limited extent. This, however, has a budget 30-times less than the Green Homes Grant (which has recently been scrapped) and due to the sizing requirements will limit installations to domestic scale, with some small non-domestic.

As the REA, we always stand firm that we should use the right technology in the right place. We fully recognise some technologies may be more deployable on a mass scale than others, but this mustn't be used as a reason to not support other technologies can also play a critical role and are already deployable.

If these technologies are not supported, houses and buildings that do not meet the norm will be unable to decarbonise, and will have less incentive to do so as they will fall out of funding.

The idea of best-use for biomass

Whilst we understand that biomass will not be an infinite resource, we don't think there is clear, up-to-date and reliable data on how much feedstock production could grow.

We would also highlight that the idea of 'best-use' as championed by the CCC, is not widely agreed with by the biomass heat sector, who view it as all eyes on the future, rather than looking at progress today.

We will closely engage with BEIS team leading on the Biomass Strategy to feed these concerns and provide more evidence and data to back future policy decisions on biomass and we invite the Scottish Government to also play an active role in shaping the strategy.

As stated above, our key policy recommendations to the UK Government on heat are set out in our Strategy document, which can be found in the Annex 1 to this response.

# Annex 1 – Key recommendations to decarbonise heat from the REA Strategy

## Energy System Infrastructure

**Problem:** *Local gas networks have low capacity available due to low downstream demand*

**Identified solutions:**

- Solutions like in-grid compression need to be more widely adopted and supported by the gas networks (GDNs)
- More dynamic capacity studies needed from GDNs.
- Live data needed through metering and sensors around network.
- Bureaucratic and regulatory barriers from the network operators and Ofgem need to be removed to allow proven technologies to be adopted.
- Socialisation of costs must be included in the review of the gas distributed entry pricing framework to enable any costs from proven solutions like in-grid compression to be socialised.

**Problem:** *Deployment of hydrogen ($H_2$) at scale will require substantial changes to pipelines, storage, appliances, safety and technical trials, and significant new low carbon $H_2$ production. $H_2$ injection at distribution level will require propane because of impact on Flow Weighed Average CV, unless Future Billing methodology addresses this issue.*

*Electrolysers that want to take electricity from the grid currently pay green levies and system fees. This makes green $H_2$ expensive.*

**Identified solutions:**

- Clear strategy and policy framework required urgently to support investment and mass deployment of low-carbon hydrogen.
- Progress must be made by the network operators to complete and implement the Future Billing Methodology. In the near term, to maximise hydrogen in the

grid it is likely hydrogen production may need to be large and near NTS offtakes to avoid billing issue (Calorific Values) and price fluctuation.

- A holistic view of network charges is needed.
- Electricity sourced from the grid to generate green hydrogen should be exempt from green levies and system charges. This could follow the approach to energy storage messaging on final consumption levy double charging.
- Collaboration and a joined-up approach between BEIS and DfT around hydrogen should be encouraged to better understand where the greatest demand for hydrogen will come first.
- Government must adopt a technology neutral approach to support clean hydrogen and must not only focus on blue and green (electrolytic) Hydrogen. Biohydrogen has significant potential to deliver zero or negative GHG emissions and must not be overlooked.
- Further REA's recommendations on $H_2$ can be found here.

**Problem:** *Heat pumps are efficient and a strategic technology for decarbonising heat, but in some cases they may place new loads on the network, for examples where homes are poorly insulated, and where flexibility cannot play a significant role. There is a need to ensure heat security on winter half-hour demand peaks. Additional low carbon generation and network reinforcement likely to be needed to meet increased demand following electrification of heat and transport.*

**Identified solutions:**

- Upgrades to the electricity grid must be made to ensure increased power demand from individual households is met.
- Any new demand for electricity driven by electrification of heating should be matched with new low carbon generation.
- Three phase electricity supply should be considered in domestic properties to meet increased demand.
- Smart charges and other measures such as heat storage will need to be utilised to counter this challenge.
- Concerns over insufficient generation can be reduced by fitting PV technology alongside heat pumps as part of distributed energy, when this is feasible.
- The role of heat pumps can play in providing cooling during summer should be stressed.
- There could be a strong role for hybrid systems, which use a heat pump most of the time, but then switch to gas during stress periods.
- Grid delivery of renewable gas should be recognised by policy makers as a route for decarbonising gas consumption in both the voluntary and regulated sectors, especially where other low-carbon options are not viable. In this scenario, the chain of custody between producer and consumer must be tracked through a robust methodology, such as Guarantees of Origin.

**Problem:** *The UK's household stock is old, a large proportion is also deemed 'hard to treat' – meaning lower-cost measures such as cavity wall insulation may be less effective. They may also be off gas and relying on heating fuels. Heat pump technology relies on good insulation rates.*

**Identified solutions:**

- This will slow down electrification of heating in some properties. In these cases other solutions are available.
- Clear, long term policy support and regulatory framework for energy efficiency measures must be adopted without further delays.
- Where energy efficiency and electrification are not viable, other available low carbon solutions such as bioenergy, which are already established, must be encouraged by Government.
- Decision making on appropriate solutions may need to be decided at the community/local level. We need a clear, national framework (and a national budget), supported and coupled with local decision making.

## The Energy Systems (the markets)

**Problem:**

*Due to higher operational costs, there is not a significant commercial incentive to switch to low-carbon heating. Abundance of natural gas in UK leads to complacency. Historic low prices for oil and gas makes competition harder. Green levies and system charges currently put exclusively on electricity bills. Lack of support for operational costs in industrial context. Running costs of low carbon fuels are generally greater than costs of fossil gas (gas and oil).*

**Identified solutions:**

- The price differential between low-carbon systems and fossil fuels must be narrowed to encourage uptake of low-carbon solutions. This could be done by:
- Carbon taxation on fossil fuels used for heat, an increase to fuel duty – but only with mitigation measures in place to protect the fuel poor.
- Government needs to signal that carbon taxes will increase steadily over time, allowing a planned shift and giving industry time to adjust.
- Gradual increase to VAT on gas over a number of years. Alongside decrease to VAT on renewable heat.
- Transition of heat needs socialisation of costs across electricity and gas.
- Plans and frameworks have to be all-encompassing.
- Moving the cost of green levies (LCF, ECO, etc) from electricity bills to general taxation to incentivise the electrification of heating.

**Problem:** *Capex cost a considerable barrier for domestic installations in particular – as identified by BEIS research and supported by members. High upfront costs discourage consumers to take up low carbon heat solutions.*

**Identified solutions:**

- A bold policy is needed from Treasury: e.g. a mechanism like the Enterprise Investment Scheme (EIS), offering tax reliefs to individual investors. It can offset 30 – 50% of the investment against income tax and gives an exemption from capital gains tax payment if the investment is successful.
- Encourage changes in attitudes to low-carbon heat.
- Homes with low-carbon heat, entail no stamp duty when sold.
- Zero interest loans for low-carbon heat installations in homes.
- To decarbonise at residential property level it is important to engage and incentivise property owners (commercial and individual). Government needs to reduce the barriers to property owner investment.

## Political Systems

**Problem:** *Fallout from closing of Domestic and Non-Domestic RHI with no replacement on the same scale. Lack of a coordinated/joined-up framework to decarbonise heat. Government's patchwork approach to heat policy does not provide the scale or predictability of previous support systems.*

**Identified solutions:**

- A co-ordinated, long term policy framework for heat decarbonisation is urgently needed to achieve the pace of progress required.
- Industrial and commercial sector decarbonisation challenges: Government must not see hydrogen as the silver bullet.
- For biomass in particular, Government thinking that biomass is a niche solution and a focus on domestic has hampered the sector.
- Green Heat Grant, the Clean Heat Grant and Green Gas Support Scheme do not cover industry and commercial. Particular lack of provision for industrial heat decarbonisation, where technologies that are suited to provide high heat loads like biomass boilers and ground source heat pumps have seen the most application etc.

**Problem:** *Particular lack of provision for commercial heat decarbonisation, causing a 'squeezed middle' of large business properties like leisure facilities, care homes, hospitals. A tough job to persuade projects to install low-carbon heat measures for commercial and industrial use where the Govt support is not there and fossil alternatives are cheaper.*

**Identified solutions:**

- A step-change in heat decarbonisation policy is urgently needed. This needs to close the significant policy gap around business and industrial heat use.
- Tariff support for the replacement of fossil fuels within industrial heat applications and fuel switching, as recommended by the CCC. Grants don't work at industrial level.
- Funded CfD for industrial heat decarbonisation as mooted by Government. This should include biomass, heat pumps, biogas, green gas, biofuels and low carbon heat technologies in addition to hydrogen.
- Tax benefits can be helpful for developers to build the business case (eg EIS support), ensuring there is a cost saving element for people installing renewable heat systems.

**Problem:**

*BEIS's Green Gas Support Scheme (GGSS) proposals (an additional 2.8 TWh/annum of biomethane in the grid by 2030) are very limited compared to the sector potential and the scheme is likely not to include plant conversions or expansions of existing assets and biomethane from thermal gasification and pyrolysis.*

*There is also a significant policy gap around biogas or biomethane applications off the gas grid. The Green Gas Support Scheme proposals are not sufficiently ambitious, are limited to biomethane from AD and may not include existing assets.*

*The Green Gas Support Scheme may only result in limited volumes of green gas injected in the grid.*

**Identified solutions:**

- The Budget allocated to Green Gas Support Scheme should be increased to reflect the volumes of sustainable biomass other than food wastes that is available.
- Existing plants should be in scope as these provide an opportunity to quickly boost green volumes in the network and deliver immediate GHG savings. Biomethane from gasification and pyrolysis should also be in scope. Government should also consider adapting the scheme to include clean hydrogen.
- Government should also consider how they can support on-site biogas/bio methane applications for factory and farm sites that are off the gas grid which will not be supported under the GGSS.
- In the longer term, move to a market-based, technology neutral mechanism, such as a green gas obligation on gas suppliers to meet a gradually increasing GHG reduction target over a period of time (this would reward technologies that deliver the largest carbon savings, whilst driving best practice and innovation).

**Problem:**

Standard Assessment Procedure (SAP), which is used to calculate EPC, does not use up to date figures on cost, efficiency and carbon intensity. Out of date calculations for renewable heat technologies regularly produce results that favour fossil fuel heating systems and fail to reward flexibility. SAP is not seen as a useful tool for measuring carbon savings from different solutions, as it combines carbon assessment with energy cost. BioLPG is not specifically included in SAP.

**Identified solutions:**

- SAP should be updated to use up to date assumptions about renewables.
- The methodology should be updated as soon as possible so that renewable heat Is the primary focus within the SAP calculation whilst taking into account the loss of generated heat.
- For it to be a direct helpful tool for Government to reach net zero, changes should be made to SAP to unpick the costs from the emissions.
- The SAP methodology should be reviewed more frequently, and the reviewed methodology implemented within the review of building regulations.
- A separate line items for bioLPG (100% bioLPG as well as 60/40 conventional/bioLPG blend) must be included.
- The Simplified Building Energy Model (SBEM) should also be reviewed to ensure low carbon systems are appropriately recognised and rewarded within the calculation for non-domestic buildings, with the link between carbon emissions and energy use being made stronger in SBEM results.