PGES
All-Party Parliamentary Group
for Energy Studies
Founded in 1980

Chairman: Ian Liddell-Grainger
Administrator: Matthew Gordon

PGES
Room 2.2
Speaker's House
House of Commons
London
SW1A 0AA

0797 445 1085
Matthew@PGES.org.uk
PGES.org.uk

SC ESNZ Inquiry 7830 **Heating our homes**
Call for Evidence 3186 Submission reference HBK482358

Response from All-Party Parliamentary Group for Energy Studies (PGES)

The All-Party Parliamentary Group for Energy Studies (PGES) was formed in 1980 with the aim to inform parliamentarians of the day on the energy issues of the day. We have representation of all major parties from Ian Liddell-Grainger MP who is in the Chair and other Council members.

We are the only Parliamentary Group to embrace all areas of the energy industry, providing a forum for high-level discussions of key energy issues facing the country. Our members include Parliamentarians from both Houses, leading academic institutions and industry representatives ranging from SMEs to multi-national corporations.

Unlike other APPGs, we are not a single-issue lobbying group – our purpose is to provide valuable insights into energy markets to inform good policy making without favouring any particular technology or approach.

The new Select Committee has launched four inquiries into the energy sector, presenting an opportunity for PGES to fulfil its objectives. Our Associate Membership, both industrial and academic, has knowledge and experience in all sectors of the Inquiry, which we would like to share.

1) What policy changes are needed to deliver energy efficient homes across the UK?

Different approaches are needed for new versus existing homes to avoid excess burdens on the public and unfairness. Different approaches may be needed for the fuel poor.

Focus on the "Able to Pay" market, not just the Fuel Poor.

To ensure that homes built now have efficient heating systems fit for the future, make immediate changes to Building Regulations (Tertiary Legislation – does not need to go before the House) to ensure all new and extended Homes have:

- Insulated wherever possible to reduce demand;
- Smart meter installation in every new (or extended) building;
- Controls in every room that manage heating/cooling by time and temperature
- Solar generation on every new build (or extended) roof (with sensible exemptions eg thatched roofs, irregular shapes etc);
- Installation of pipework and stored hot water in new buildings to enable heat pump installation (with sensible exemptions eg for tower blocks);
- Require ongoing building performance checks for commercial buildings.
- Retrospective measures are required to improve original structure or controlled services.

Amend legislation, so that Building Regulations apply at every change of occupancy or use, with inclusions of sensible spending caps.

Reform the EPC so that it explicitly measures heat losses, rather than being an estimate of energy costs.

In the UK, it is widely recognised that people do not want the cost and disruption in their homes associated with improving the energy efficiency and this is a big barrier. Often, the cost of changes is large relative to the potential savings.

2) What are the key factors contributing to the under-delivery of the UK's government-backed retrofit schemes?

Overcomplication and continual change of finite grant schemes. Each one distorts the market place for a short period as installers or homeowners seek incentives, then fades away quickly when the fund is exhausted. The installer base has signed up too many different schemes over the years, only to be asked to retrain and sign up for another.

The EPC does not accurately reflect heat losses, so recommended actions to improve the rating rarely actually improve heat losses and more rarely at an acceptable cost.

The disruption and financial cost are the major factors affecting the uptake of heat pumps. Also compared to a boiler, heat pumps are simply not as good, generally delivering less warmth at higher cost. Other barriers for heat pumps are existing radiators too small, pipework diameter too small, no space for a hot water cylinder and no savings in running costs over gas.

The Clean Heat Market Mechanism should not be imposed on manufacturers – the problem is a lack of consumer demand, not of supply.

The technology chosen by the Government as their favoured one is misguided, they could get themselves out of this hole by promoting and part funding hybrid boiler/heat pump systems. MCS only allow hybrids to be registered with them and therefore only obtain the grant if you meet their requirements and are in Scotland.

3) Which standards and assessment frameworks are needed to deliver a reliable, skilled workforce capable of transitioning UK homes to modern heating solutions?

The workforce required to install any form of heating (or cooling) into homes is similar, whether the fuel is oil, gas or electricity, or the technology boilers or heat pumps, but qualifications differ.

MCS Registration is required for any government subsidised heat pump installation but this does not apply to non-government funded installs. All installations should be required to be undertaken by MCS (or equivalent) accredited installer and this would improve customer satisfaction and protection.

Every installer, whether they are the specifier or not should hold the low temperature heating design qualification as well.

To promote STEM education, not as STEM, but as GREEN might encourage more school-leavers to enter the sector.

4) How might the Government support innovation in delivering local solutions?

Local Authorities (LAs) manage planning and building control processes and are the natural means of delivering these solutions. Simple thermal imaging testing can be instigated by LAs to identify the leakiest properties and overlay with poverty data to identify priority properties.

Government should support research to improve understanding of the measures which will deliver the highest reductions in heat losses in different property types eg improving the U-values of walls, windows, glazing ratio etc.

Innovation funding is better than subsidy, innovations are permanent, subsidies need to be continuous to have much effect.

Allow areas where there is availability of hydrogen to offer a hydrogen network and support low carbon gas instead of heat pump technology.

Conduct a hydrogen village trial (as planned) but also a heat pump (electrified) village to get balanced feedback on both technologies.

Energy network funding is set by Ofgem with reference to the national net zero target. However some local and regional authorities have more ambitious targets. We support greater devolution as a means of delivery and where a region has the ability to decarbonise more quickly than 2050 then it should be encouraged. Energy networks are building strategic partnerships with local and regional authorities across the country which should be supported by ensuring whole systems planning is at both the national and regional level.

5) What role should customer choice play in the future planning of energy networks for home heating?

Consumer choice is essential to successfully decarbonise heat. Changes will affect every home so customers will expect to have choice and will need to be involved– not seeing Net Zero as something that is being done to them.

Government should support free market choice for the end user by making low carbon fuel choices available to them – electricity, blended hydrogen, hydrogen (H_2), biogas, rDME and HVO all have a part to play. Appliances do not create CO_2, fuels do.

Allow consumers to choose the changes they want for technology in homes (eg wet or dry heating systems, boilers or heat pumps), but enforce how those are controlled to eliminate waste. Let Government change the carbon content of fuel provided to homes to maximise the benefit of technology installed (eg low carbon electricity, low carbon gas)

Consumer and installer choice is everything. One manufacturer (of both heat pumps and boilers) commented 'In all my years in this industry I have never persuaded a customer who wanted a new boiler to have a heat pump instead, yet this is what DESNZ believe we can do. Take away the grant and it's only eco minded people who want one. In summary most heat pumps are bought rather than sold. Basically, the people who want one are choosing them and that is very few, mostly middle class to wealthy households.

6) Does the current state of consumer protections for low-carbon home technologies represent a barrier to uptake of these products?

It does not appear to hinder the take up or demand, but it might scare installers from fitting heat pumps though as boilers don't give them any trouble. Many installers start a heat pump training course at a major manufacturer but after one day say "it's not for me, there's plenty of gas and oil to see out my time".

Yes. There are insufficient protections to both ensure installations are completed to the required standard and that the claims made by some installers are realistic.

Also not enough protection against unsuitable installations such as spray foam insulation onto the underside of roofs, (condensation issues and expensive to remedy).

On installation quality, the performance of heat pumps is far more dependent on the design and installation process than alternatives such as electric and hydrogen boilers. Accreditation of installers is currently voluntary, meaning anyone can install heat pumps with little controls over the quality of work completed. Universally applicable standards must be developed to define what good looks like, with customers able to hold installers to account should installations not meet those standards. Whilst MCS provide standards today, but only around half of all heat pump installers are currently MCS accredited.

Many marketing claims made by suppliers and installers of low carbon technologies are either questionable or misleading. A recent report from the Competition & Markets Authority (CMA) found concern with the marketing of a wide variety of low carbon products. Customers are vulnerable to such misleading claims. This is likely to undermine confidence in and support for the transition. We support the CMA's proposals for addressing this, for example, the role of quality assurance schemes.

7) How will the public be able to afford the switch to decarbonised heating?

Reduce demand. If home insulation is ineffective, improve it. Improving insulation reduces energy demand. This applies equally to a gas boiler heated home as a heat pump. Indeed, the return on investment re CO_2 savings is higher with a boiler where any % reduction in demand equals the same percentage reduction in CO_2.

Add a requirement so heating appliances are capable of providing balancing services to the grid. For both heat pumps and boilers this will reduce waste and therefore demand.

Focus on reducing waste. This does not only mean insulation, as that merely provides the potential to reduce waste.

Controls must be mandated for every heated or cooled room, so that overheating/cooling does not occur. If both heating and cooling are available, ensure they cannot operate in conflict.

EPC reform is needed to ensure the quality and condition of materials is maintained eg broken windows are replaced, something the EPC currently ignores.

There is a misconception that heat pumps will become the same price as a boiler installation One major manufacturer commented. "I don't see any chance of heat pumps coming down much in price, in fact they are going up in price. According to the BUS the average cost of a Heat pump installation is £13,400, that's an increase from the £12,700 6 months ago".

The UK market for heat pumps may not be mature, but the global market is, so there is no basis for assuming a reduction in unit costs as the UK market matures. Most of the heat pump cost is in the installation.

Customers can currently put a new boiler installation on a credit card, for a heat pump they'll need a bank loan or extension to their mortgage.

Heat as a service isn't working as it leaves a charge on the property when you come to sell it, a charge that any new buyer may not want to take on.

The public will need support to implement a change, regardless of the technology chosen. There will be a balance between Capex and OpEx. A heat pump installation costs an average of £13k compared to a natural gas or hydrogen boiler installation expected to be £3k.

Currently the operating cost of a heat pump is higher than a natural gas boiler, but may be lower than a hydrogen boiler, at least initially.

8) How will decarbonisation plans be drawn up in each area?

Government is more effective making changes that affect the whole country, network and supply, but encouraging more regional or local champions and businesses to speed decarbonising.

Hydrogen could be introduced locally around the industrial clusters.

Electricity, HVO or rDME are the only option in rural, off gas grid areas.

In Germany, energy policy is being delegated to city level where planners have to match the demand with available supply. In areas where carbon free gas is available this allows the local area to incentivise gas and vice versa. A similar model could be considered here, or at east on a regional basis.

Most boiler replacements are distress purchases when the boiler breaks down in winter. Given the time taken to install a heat pump plus the availability of installers and a suitable power supply this makes planning difficult, although hydrogen ready boilers would provide a seamless solution.

9) Do the current EPC frameworks help consumers make informed decisions on transition?

Most consumers don't know what an EPC is, but they would soon take an interest if they got a lower council tax if they had a high rating, A, B To make them make changes that improve their rating there needs to be a reward for doing so, however it is vital the EPC is reformed before it is used as the basis for wider charging.

We at PGES are concerned about the prospect of unfairness and inefficiency that will arise should the system continue in its current form.

9i Purpose: the EPC is often described as an "energy efficiency" measure. This is incorrect. The EPC explicitly measures energy cost. There is also a general misconception that "we wish to improve the energy efficiency of buildings". This is also incorrect – the idea a building is efficient has no real meaning – appliances are efficient, buildings are effective eg well-insulated buildings are effective at retaining heat.

We recommend that correct and meaningful terminology is used to avoid confusion. We also recommend that the EPC is used solely for the purpose of measuring the amount of energy losses a building has, and as a secondary point, the amount of input energy required for comfort. This second aspect is by its nature subjective, but a standard could be set to quantify the energy necessary to maintain a set temperature and humidity for example 20°C and 40% humidity. The EPC report could inform the householder of the cost of maintaining this comfort level based on the current default energy tariffs or similar benchmarks.

9ii Subjectivity: nothing is measured: the EPC is purely based on the subjective opinion of the assessor and their assumptions about the construction methods employed in the property. Different assessors can and do give different ratings to the same property.

We recommend that the EPC includes actual, objective and measurable data such as thermal imaging and air flow testing.

9iii Condition and quality of materials: currently the EPC does not differentiate between high and low quality materials, or their condition. A property with smashed windows has the same EPC as a property with perfect windows despite obviously suffering from higher heat losses.

9iv Lack of realism: EPCs often include recommendations to guide the building owner as to the ways in which the EPC could be improved. These often involve very high upfront costs and long pay-back periods.

We recommend changing the recommendations element of the EPC to ensure they are achievable and evidence-based.

9v The Performance Gap: the difference between the actual energy consumption of a new building once completed is often an order of magnitude larger than that anticipated in the design phase – Studies by the University of Bath demonstrated that the modellers responsible for calculating expected energy use pre-construction lack the knowledge required to specify the most effective energy reduction measures – their professional certifications relate to ability to run the models rather than knowing what inputs to use.

The certification scheme for building designers should be updated to require them to better understand which measures are effective in reducing energy losses. Post Occupancy Testing should be mandated for all new-build properties, and that building designers are held accountable for the energy performance of buildings once built, so the Performance Gap is reduced .

We also recommend that the purpose of the EPC is separated from other Government policy. It is designed to measure the energy cost of a property – to the extent that energy waste is bad for the environment, but there is a conflict where more environmentally forms of heating are more expensive, creating conflicts with climate policies.

The EPC should be agnostic as to the choice of heating in a home – it should measure the extent to which input energy is retained, and the degree to which additional input energy is required for purposes other than heating, such as ventilation. Other policy levers should be used to incentivise more sustainable heating choices, noting that the solutions are likely to differ depending on location and property type, as well as technology availability. Currently no homes have the option of switching to hydrogen for example, but this might be a more efficient choice than a heat pump – such households should not be penalised in the interim for retaining methane as their fuel of choice.

Any building could in theory achieve a cheaper cost of energy by changing the source of that energy, for example by installing a wind turbine or solar panels, but this does not consider the issue of energy waste, practicality or capital cost. However, the same property might have lower energy costs at a lower capital cost if sensible waste reduction measures were implemented. The EPC should identify the extent to which such improvements could be realised, irrespective of the source of the input energy.

10) Do standards need to differ for different types of housing?

The standard of performance should be the same, but the means to achieve them will differ – research is needed to better understand which measures would be most effective at reducing heat losses without creating moisture bridging and other issues in different types of properties / buildings using different construction methods.

Yes, there needs to be some context given to property size, age and the financial position the owner is in. Where a heat pump is intended, there should be an exemption permitted, similar to the introduction of condensing boilers. A points system could be used to define when an exemption applies.

11) What is the role of different levels of government in developing, funding and implementing schemes?

Governments are ineffective when encouraging decisions in individual voters' homes, but can have a huge effect by making the big national decision. For example, many millions of homes will make decisions regarding the equipment installed in their homes, but the Government can affect millions of homes at a single stroke by decarbonising the fuel they use – this applies equally to gas, oil or electrical heating.

The Government departments need to be aligned - DESNZ set a target but then there is no enforcement from DLUC happening. They seem to be pushing it onto manufacturers with schemes like the misguided Clean Heat Market Mechanism. They also use the ERP directive to try and implement the EPBD requirements.

The government must not force people into making expensive investments which leave them with a lower comfort level, hence there needs to be a level of certainty in predictions and marketing claims.

Make firm announcements to confirm the introduction of H_2 into the gas mains up to 20% by volume, as well as a changeover date for 100% H_2. This will add confidence to the public regarding the sustainability of gas in the move to Net Zero and ensure the introduction of hydrogen ready condensing boilers. As people replace their old boiler cost effectively, household efficiencies will increase.

Government must not make the British public feel that they are paying a disproportionate price compared with the rest of the world. Government must encourage the whole world to proceed towards Net Zero on a similar timeline. If the UK only produces 2% of the worlds CO_2 emissions we could put ourselves out of business without any significant effect on the climate.