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CAS Response to Low Carbon Heat Networks (March 2019)

Who we are:

The policy teams at Citizens Advice Scotland use research and evidence to put people at the heart of policy and regulation in the energy, post and water sectors in Scotland. We work with government, regulators and business to put consumers first, designing policy and practice around their needs and aspirations. We aim to represent the views of different consumer groups using evidence of consumer views and supporting research wherever possible.

Citizens Advice Network in Scotland

Citizens Advice Scotland (CAS), our 60 member Citizen Advice Bureaux (CAB) and the Extra Help Unit, form Scotland's largest independent advice network. Advice provided by our service is free, independent, confidential, impartial and available to everyone. Our self-help website Advice for Scotland provides information on rights and helps people solve their problems.

In 2017-18 the Citizens Advice Service network helped over 295,100 clients and dealt with almost 800,000 advice issues for clients living in Scotland. With support from the network clients had financial gains of almost £142.2 million and our self-help website Advice in Scotland received approximately 3.2 million page views. On energy consumers issues in particular, we advised on over 41,000 energy-related issues in 2017-18, generating over £1.8m in client financial gain.

Our extensive footprint is important in helping us understand how issues impact locally and nationally across the country and the different impacts that policies can have in different areas.

General comments and key points:

- Any policy framework for decarbonisation of heat proposed by the Scottish Government should be clear and consistent in the long term to encourage consumer confidence and investment.
- For all low carbon heat technologies we have provided evidence on in this consultation, cost, lack of confidence, inconsistent signals from government, and lack of regulation are significant barriers to uptake. Financial support, sound advice, clear

and consistent signalling and regulation, and access to swift and fair redress are essential for Scotland to transition to low carbon heating.

- Behavioural change is essential to the long term success of low carbon heating systems in increasing energy efficiency and reducing fuel poverty. Consumers should be offered pre and post installation support to help them make the most of their new system.
- Heat networks are unlikely to be an attractive choice without consumer confidence, which is best secured by installing mandatory consumer protections and adopting a strategic approach to planning, providing reliable funding, improving skills and training, stimulating investment, and giving reliable advice to developers. The best way to secure certainty for investors, developers, and consumers alike is to introduce regulation.
- A balance must be struck between long term and short term affordability of low carbon technologies in order to avoid a sharp increase in consumer bills, particularly for those least able to pay.
- Financial support for the decarbonisation of heating should be made an infrastructure priority. We support an area based, phased approach that will target fuel poor homes first, ensure high quality standards, and avoid premium pricing in rural areas like the Highlands and Islands.
- Reliable, accessible, and easy to understand information and advice should be made available throughout the entire process from decision making to post-installation support and maintenance.
- The development of a robust consumer protection framework and Quality Mark through Energy Efficient Scotland should cover both energy efficiency and low carbon heat. We have previously called¹ for the Scottish Government to put in place a statutory licence which should include Fair Heat Contracts, providing clear information on a range of consumer protections including joining and leaving rights.²

Responses to Specific Questions:

CAS offers evidence and research based information and in this capacity will respond to only the questions in this consultation for which we have evidence to contribute. We do not have a view on all issues raised in this call for evidence.

1. What evidence can you provide of low carbon heat technologies being taken up without government support?

2. What other barriers may impede the uptake of low carbon heat in buildings not currently using mains gas?

3. What could we do to remove these barriers and support the uptake of low carbon heat? Can you give examples of successful low carbon heat implementation?

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https://www.cas.org.uk/system/files/publications/cfu_response_scottish_government_lhees_and_district_heating_consultation_2_final_190218.pdf

² Consumer Futures Unit, *Different Rules for Different Fuels: Insight Report*, [link](#), p. 16.

- 4. How can complementary systems, such as solar PV and heat pump systems be deployed to overcome such barriers?**
- 5. What do you consider to be the principal building-specific constraints on low carbon heat?**
- 6. What can be done to overcome these constraints?**
- 7. What evidence can you provide on the limitations of low carbon heat technologies (e.g. heat pumps) in buildings with poor energy efficiency?**
- 8. What low carbon heat solutions are appropriate for hard-to-treat properties where there are limited opportunities to improve energy efficiency of the building fabric?**
- 9. Please specify whether your evidence relates to domestic or non-domestic systems.**

Regarding ground source, air source and water source heat pumps, what evidence can you provide on:

- a) the cost of the technology, including installation, maintenance and running costs and alignment with costs related in the RHI data in tables 2 and 3**
- b) customer satisfaction with the system**
- c) lifecycle and overall efficiency of the technology**

10. What factors might inhibit uptake of heat pumps?

- 10.1** The largest barriers to consumer uptake of heat pumps are cost – both the high initial cost of installation and high potential running costs – lack of confidence in new technologies and the regulations surrounding them, inconsistent signals from government, limited public awareness, and the “hassle factor” of having new heating systems installed³. Evidence from our bureaux suggests that poor installation, incorrect use, and a failure of installers and energy companies to inform consumers that a change in meter is necessary has, in many cases, led to higher fuel bills for the consumer.

Case study: Client visited the bureau about a very high electricity bill following the installation by her council (prior to her moving in) of an air source heat pump in her flat. She asked Home Energy Scotland to come out and investigate her heating situation, and they found that she had a three rate meter, instead of the single rate meter a heat pump requires. When the Client tried to get her energy company to replace the meter, they repeatedly cancelled the appointment with no explanation.

11. What do you propose as solutions to overcome any barriers to uptake?

³ Community Energy Plus & Eaga Charitable Trust (2017). Pg. 8
<https://www.eagacharitabletrust.org/app/uploads/2017/11/CEP-final-report.pdf>

- 11.1** Financial support, sound advice, and access to swift and fair redress are integral to the widespread uptake of heat pumps and other low carbon heat technologies in Scotland. Support and practical advice should be readily available throughout the decision making, installation, and post-installation processes and should include advice about available grants and other funding where applicable.
- 11.2** Especially important for the long-term success of heat pumps and other low-carbon heat sources is support for behavioral changes. As stated in [our response](#) to the 2017 draft Scottish Energy Strategy,

"Consumer behavior has a vital role to play in both helping to reduce energy demand, which can help to reduce fuel poverty, and to enable the successful uptake and delivery of new technologies⁴."

Consumers should be offered pre and post-installation support to help them make the best use of their new heat pump technology. A manual, written in plain and easy to understand English, should be provided and explained at the time of installation, as should the necessary meter type for the heat pump. Our *Hot off the Grid* report recommended that landlords give in home demonstrations and explanations of new heating systems to each new tenant⁵.

- 11.3** Clarity and consensus from the Scottish Government about policy frameworks will help nurture consumer confidence and investment. As Community Energy Plus and the Eaga Charitable Trust found,

"Countries showing the highest deployment of low carbon heat are also characterized by long-term government support and policy stability⁶."

CAS strongly recommends that the government set out a clear, consumer driven policy that offers consistency and familiarity for consumers in the long term. This policy should include a mixture of easy to access funding mechanisms, subsidized incentives, clear regulation about pricing, and robust support throughout.

12. What innovations could reduce the operational cost of heat pumps, i.e. higher performing heat pumps, new refrigerants, and 'time-of-use' tariffs coupled with thermal storage, 'heat-as-a-service' business models, etc.

13. Please specify whether your evidence relates to domestic or non-domestic systems.

⁴ Draft Scottish Energy Strategy (2017) Pg. 3.

<https://www.cas.org.uk/publications/consumer-futures-unit-response-scottish-government-draft-energy-strategy>

⁵ CAS (2016) *Hot off the Grid*.

https://www.cas.org.uk/system/files/publications/hot_off_the_grid_delivering_energy_efficiency_to_ural_off-gas_scotland_final.pdf

⁶ Community Energy Plus & Eaga Charitable Trust. Pg. 7.

<https://www.eagacharitabletrust.org/app/uploads/2017/11/CEP-final-report.pdf>

Regarding hybrid heat pumps, what evidence can you provide on:

- a) the cost of the technology, including installation, maintenance and running costs
- b) customer satisfaction with the system
- c) lifecycle and overall efficiency of the technology
- d) the ability of hybrid heat pumps to reduce peak demand for electricity whilst also reducing carbon emissions

This evidence relates to domestic heat systems.

13.1 Our [Hot off the Grid](#) report found that the average cost of installation was £10,272 for air source heat pumps, and £16,192 for ground source heat pumps⁷. Modeled running costs vary thereafter based the type of home (see figure 1). Scottish Enterprise notes that only gas driven heat pumps are estimated to deliver substantial operating cost savings when compared to a new, efficient gas boiler⁸.

Heating system		Detached solid stone	Semi-detached cavity	Detached timber frame
Existing	Open coal fire & portable heaters	£4,784	£1,565	£1,763
	Electric storage heaters	£3,330	£1,019	£1,149
	Bulk LPG boiler	£3,401	£1,135	£1,327
	Auto feed solid fuel floor mounted boiler system	£2,037	£665	£766
	Solid fuel open fire back boiler system	£2,852	£953	£1,038
	Aga/ rayburn solid fuel boiler system	£3,124	£948	£1,090
Improvements	Smart storage heaters	£2,331	£769	£894
	Air source heat pump	£2,176	£731	£869
	Ground source heat pump	£1,701	£573	£681
	Biomass boiler	£1,750	£542	£628
	Electric boiler	£2,227	£696	£805
	Oil boiler	£1,664	£539	£629

Key

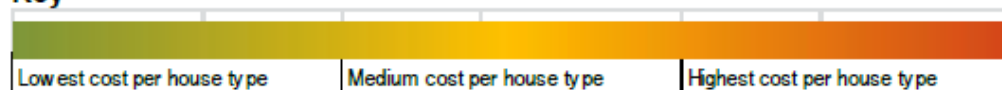


Figure 1: Estimated (theoretical) annual heating system running costs (Not inclusive of DHW)

⁷ CAS (2016) *Hot off the Grid*. Pg. 29

⁸ Scottish Enterprise, Energy Efficiency Discussion Paper (2019) Pg. 25

- 13.2** Consumer satisfaction with heat pumps varies based on how well the pump was installed, the suitability to the home, and how effectively the client knows how to use their new heating system. Support and advice throughout every stage of the process, from decision making to post-installation maintenance is essential for good customer satisfaction and trust of the new technologies.
- 13.3** The lifecycle and overall efficiency of heat pumps depends on the type of property it is installed in, the energy needs of a property's occupants, and what other systems and energy efficiency measures are installed in the property. According to the Pebbles Trust,

"House type is particularly relevant to heat pumps. Heat pumps work best when asked to do as little as possible. Installing them in poorly insulated and draughty houses with conventional radiators means they are being asked to deliver water at the higher temperatures required by radiators, and these radiators are losing that heat quickly. Heat pumps installed in these situations are unlikely to reach the levels of efficiency quoted. Conversely in a well-insulated and airtight home, with underfloor heating delivering heat at lower temperatures without great losses, heat pumps are more likely to be as effective as claimed.⁹"

To achieve maximum efficiency from hybrid heat pumps, they should only be installed in properly insulated properties for clients that understand and are effectively taught how to use them successfully.

14. What factors might inhibit uptake of hybrid heat pumps?

15. What do you propose as solutions to overcome any barriers to uptake?

16. Can you share any evidence on the types of buildings where hybrid heat pumps may best be deployed?

17. Please specify whether your evidence relates to domestic or non-domestic systems. Regarding electric storage heating, what evidence can you provide on:

a) The cost of the technology, including installation, maintenance and running costs

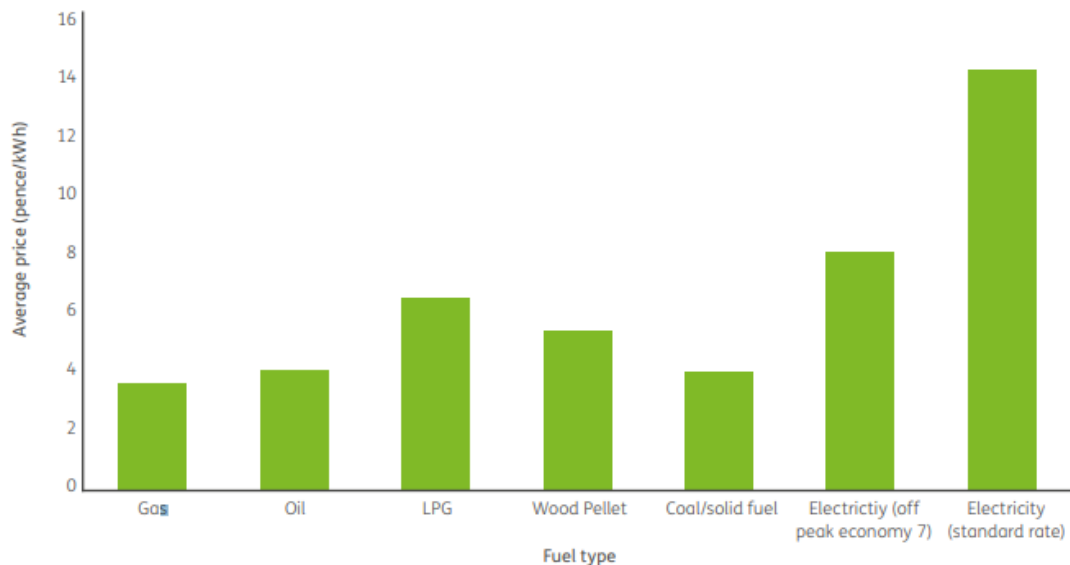
This response concerns domestic systems.

- 17.1** Electric heating has consistently been the most expensive way in Great Britain and the unit cost of electricity is almost 3 times that of mains gas, as shown in the graph

⁹ Pebbles Trust (2018)
file:///P:/01_Energy/02_BAU%20Work/01_Consultations/Energy%20Efficient%20Scotland%20accelerated%20targets%20May%202019/[digitalv3]guide-to-domestic-retrofit-compressed.pdf

below¹⁰. Electric heating users commonly use storage heaters and many consumers find the costs unaffordable. Research carried out by CAS in 2017 found that households using electric heating were twice as likely to say their heating was unaffordable as those using mains gas¹¹. This is also reflected in fuel poverty figures; 52% of those using electric heating were in fuel poverty in 2017, compared with 19% of those using gas¹².

Average GB Heating Fuel Price per kWh, March 2018*



* Energy Saving Trust, based on average unit cost over 12 months to March 2018

17.2 CAS' *Hard Wired Problems* report (2018) found that the high cost of electric heating is consistently one of the most pressing concerns of households that rely on it, and there is a perception that high costs are unavoidable and inevitable. Evidence gathered from consumers during the *Hard-Wired* research, and from our CABs since, shows heating costs eating into a large proportion of consumers' income – a problem exacerbated by price increases and an inability to switch where restricted meters have been installed. We have seen cases of consumers accumulating thousands of pounds in debt, self-disconnecting or going without heat due to high costs.

Consumer comments gathered in surveys and workshops during the research included:

- “[It is] discouraging to learn [the] only option is the most expensive!”
- “Electric heating [is the] system from hell due to the excessive cost.” >
- “[The] variation between customers’ experience and the amounts of money they are spending for energy is staggering.”

¹⁰ https://www.cas.org.uk/system/files/publications/2018-08-15_off-gas_report_final_0.pdf

¹¹ CAS Consumer Futures Unit, Consumer Tracker Survey, 2017

¹² <https://www.gov.scot/binaries/content/documents/govscot/publications/statistics-publication/2018/12/scottish-house-condition-survey-2017-key-findings/documents/tables-figures/tables-figures/govscot%3Adocument>

Consumer helpline¹ case: The client has been exchanging emails with the supplier. The client lives in a flat and does not have gas. The client has night storage heaters and is on comfort plus tariff/meter. This means that the client is virtually trapped with the their supplier. The price appears to be increasing by nearly 100%. The client and 2 other neighbours are shocked about the increase. The client is finding it difficult to switch with their current meters.

Case Study: The client, in common with others in the homeless accommodation, finds that the storage heaters installed in the flat consume so much electricity that almost his entire benefit payment is needed to keep them running. Even though it is summer time the flats are cold and need to be heated. Currently he estimates that he is paying £60-70 every week on electricity, which was manageable when he was receiving Employment and Support Allowance (ESA), but now that he is receiving the single person Universal Credit (UC) payment his income has effectively halved and he can no longer afford to heat and eat and will be unable to pay any other bills or his mobile phone top ups. There is a problem with expensive heating in homeless accommodation, making it impossible for vulnerable people to keep themselves warm and the problem of income reduction for clients moving from ESA to UC.

b) Customer satisfaction with the system?

17.3 Research by Consumer Focus¹³ in 2013 found that 25 per cent of consumers using storage heaters were dissatisfied with their heating system, compared with just 9% of those using gas central heating¹⁴. CAS' *Hard-Wired* research found that a common consumer complaint was about storage heaters failing to retain heat correctly or being difficult to control, potentially causing higher costs due to inefficient use and problems controlling the heating system¹⁵. The report also noted that this lack of control may also contribute to increased stress and a mistrust of, and reluctance to engage in, the market.

17.4 Consumer comments gathered during the research included:

¹³ Consumer Focus were our predecessors as the statutory advocate for energy consumers in Scotland

¹⁴ <https://webarchive.nationalarchives.gov.uk/20140408193106/http://www.consumerfutures.org.uk/reports/from-devotees-to-the-disengaged-time-of-use-tariffs>

¹⁵ https://www.cas.org.uk/system/files/publications/hard-wired_problems_-_delivering_effective_support_-_11-10-2018_0.pdf

- “Lack of control with much electric heating is a difficulty e.g. storage heaters aren’t always controllable”
- “[The heating system is] a waste of money because the heating is coming on during the day when most people are out at work.”
- “[The resident] doesn’t dare to touch the controls.”

Also in the *Residents of Glasgow’s High-Rise Dwellings Report*, cited in Down to the Wire report by EAS and Glasgow Caledonian University¹⁶ a consumer commented:

- “I moved here in 2010 but have never used them – no one showed me and I am frightened they will be expensive to run.”

17.5 There are also specific barriers to switching supplier for consumers on restricted meter, such as DTS (almost all of which use storage heating). Although a remedy by the Competition and Markets Authority is trying to address such barriers our evidence indicates that energy suppliers, advice providers and consumers appear to have limited awareness of it. Prior to the remedy, Ofgem found some consumers were so frustrated at the lack of alternative offers that they paid for their storage heaters to be removed and replaced with a gas central heating system¹⁷. Overall, customer dissatisfaction with storage heating is largely caused by difficult to understand systems, high costs, limits to controllability, and barriers to switching for some.

c) lifecycle and overall efficiency of the technology

17.6 CAS has seen many cases of storage heaters being used inefficiently due to controls that are hard to understand, resulting in colder homes, higher bills, and less confidence in the heating system. Academic studies have also shown that storage heating systems frequently operate inefficiently despite more efficient usage, and this is a particular issue among older systems¹⁸. To combat this, our *Hard-Wired Problems* report called for targeted support for upgrades to electric heating systems to be explored¹⁹. Some systems could be beneficially upgraded to high-retention storage heaters to improve efficiency, and new technologies related to electric heating, beyond traditional energy efficiency improvements, should also be reviewed.

One support organisation surveyed during the *Hard-Wired Problems* research stated:

¹⁶ https://www.cas.org.uk/system/files/publications/down_to_the_wire_-_technical_report_-_eas_gcu_dr_fraser_stewart.pdf

¹⁷ <https://www.ofgem.gov.uk/ofgem-publications/82288/state-market-customers-dynamically-teleswitched-meters.pdf>

¹⁸ De Haro, TM and Koslowski, A, Fuel Poverty and High Rise Living: Using community-based interviewers to investigate tenants’ inability to keep warm in their homes, in *Journal of Poverty and Social Justice*, 21:2, June 2013

¹⁹ https://www.cas.org.uk/system/files/publications/hard-wired_problems_-_delivering_effective_support_-_11-10-2018_0.pdf

- “It is the lack of support available to households that is the biggest problem. Numerous people talked about ‘getting lost’ using the manual controls, and the handbooks that come with the heaters just make things more confusing.”

In the Residents of Glasgow’s High-Rise Dwellings Report, cited in Down to the Wire report by EAS and Glasgow Caledonian University²⁰ a consumer commented:

- “I try not to use them [storage heaters] because daytime electricity is expensive and they seem to be warm during the day.”

Case study: The client has been receiving very large electricity bills. She had two meters and storage heating. She did not have gas but considering she was only in a one bedroom flat, the amounts were very high, averaging out around £124pm. She had sought advice from her energy provider, who had broken down her bills to equate £8 per day for heating and £3 for everything else. She had tried to reduce the use of her appliances but this did not seem to make much difference. The client detailed that the meters were inside her house. There was a box that she did not know anything about outside her house but all she knew, was that she had secured it shut with a screw to prevent it blowing in the wind. The client admitted she knew nothing of how her storage heaters worked and had never been shown how to use them.

18. What factors might inhibit uptake of electric storage heating?

18.1 As mentioned in response to question 17 (a), many consumers find electric heating, including storage heating, unaffordable, and there are associated problems with debt, an inability to switch supplier, self-disconnection, or going without heat. Similarly, our response to question 17 (b) details problems with consumer understanding and control of storage heaters, leading to inefficient usage, higher costs, difficulty budgeting, and disengagement. These problems can be compounded where consumers are in vulnerable situations. They can also be exacerbated by poor customer service by suppliers; where appointments are cancelled, calls are not returned or erratic bills are issued, debt can accumulate, often at a fast rate due to the high costs of electric heating.

²⁰ https://www.cas.org.uk/system/files/publications/down_to_the_wire_-_technical_report_-_eas_gcu_dr_fraser_stewart.pdf

Consumer helpline case: “The client has been in dispute with supplier D for 6 months. The client moved into the property in October 2014. The client set up a direct debit (DD) of £80 a month. The client then got a bill of £26,000. The client has storage heaters. Nobody could explain to the client why the bills were so high. In April 2016, the supplier was told to cancel her direct debit until they could find out why her bills are so high. The supplier said they would send someone out to have a look at the meter. This appointment was cancelled 4 times. The supplier has said they won’t send anyone else out, to look anymore to find out why her bills are so high. The client won’t even put her heaters anymore.”

18.2 Furthermore, those using storage heaters, and particularly those also on restricted meters, often have more complex advice needs than those using gas central heating. CAS’ *Hard-Wired Problems* research found that some consumers are receiving mixed messages from organisations such as energy suppliers, installers of energy efficiency measures, governments, the regulator and support agencies in relation to their electric heating. Many organisations providing advice and support also cited a lack of information on electricity only tariffs such as time-of-use tariffs as a barrier to delivering effective support. Comparing prices can be difficult for those on restricted meters, and despite the CMA remedy, it is still not always clear whether they will save money by switching.

19. What do you propose as solutions to overcome any barriers to uptake?

19.1 There are clear gaps in consumer understanding of storage heaters which effective advice provision can help to bridge; allowing for more efficient usage, more informed decisions about switching supplier and system upgrades, and helping consumers engage with suppliers.

19.2 CAS’ *Hard-Wired Problems* report recommended that additional advice for electric heat users should be developed, including a helpline for complex electric heating issues. To help to address this, the Scottish Government has since announced that Home Energy Scotland will include a new advice service for electric heat users which will be managed by the Energy Saving Trust – a decision we welcome.

19.3 We also recommend steps to ensure consistency of messaging across organisations, greater promotion of national advice and referral mechanisms, more widely available training for advisers, longer term funding for holistic support services, and support for heating upgrades. Better publicising the CMA Restricted Meters Remedy among consumers, support providers and energy suppliers would also be beneficial, and providers need to be clear about what the remedy can and cannot do for consumers. We have recently been encouraging Ofgem to investigate whether suppliers are complying with the CMA remedy for restricted meters, and take action where they are not.

19.4 Although advisers can provide budgeting and income maximisation guidance, there are limits to their capacity to combat the inherent expense of electric heating. Doing so would include structural changes to the efficiency of heating systems, metering and tariffs, and decreasing generation and transmission costs

20. Can you provide any evidence of electric heating technologies not already described that should be considered as potential future heating solution?

21. Can you comment on the comparative installation, operating and maintenance costs of these technologies in relation to other electric heating sources? As well as their lifetime and efficiency?

22. Can you provide evidence on the performance of integrated systems such as heat pumps used in conjunction with battery storage and solar PV?

23. How could locally integrated systems, such as those mentioned above, help to overcome electrical grid constraints and what market mechanisms could be used to promote on site generation and use for low carbon heat?

24. Please specify whether your evidence relates to domestic or non-domestic systems.

Regarding Bioenergy technologies, what evidence can you provide on:

a) the cost of the technology, including installation, maintenance, fuel and other running costs, and the extent to which costs of biomass boilers are in line with those in tables 2 and 3 above

b) customer satisfaction with the system

c) lifecycle and overall efficiency of the technology

d) type of feedstock used, and whether this is grown in Scotland or imported

25. What factors might inhibit uptake of bioenergy technology?

26. What do you propose as solutions to overcome any barriers to uptake?

27. What evidence can you provide to show whether there is a strong potential for growth of the biogas supply?

28. Can you provide evidence on the relative cost of using Scottish produced bioenergy feedstocks compared with conventional fossil fuels?

29. Can you provide any evidence on the potential to supply bio liquid fuels sustainably at reasonable cost? With reference to specific fuels such as bio-LPG and different types of bio-diesel.

30. Please specify whether your evidence relates to domestic or non-domestic systems;

Regarding heat networks, what evidence can you provide on:

a) the cost of the technology, including installation, maintenance, fuel and other

running costs

b) customer satisfaction with the system

c) lifecycle and overall efficiency of the technology

- 30.1** Heat networks vary depending on scale, the efficiency of the energy centre, quality of service, and technical abilities of the heat network operator. Fuel costs also vary by fuel type.
- 30.2** Comparing servicing costs for district heating with individual gas boilers is difficult: communal boiler servicing costs are included in a heat network's costs, while similar costs are borne separately by those with their own individual gas boiler. BEIS concluded in 2017 that 'there is evidence of relatively poor transparency in the heat network sector' and found significant variation in costs²¹. While some consumers in England and Wales paid more than £1,000 or even £2,000 a year under district heating schemes, median prices were lower. Similarly, the CMA found that the total operating costs varied significantly; across nine heat networks the total annualised OPEX ranged from £300 to £650 per customer²². The need to cover the capital costs of building a district heating scheme means that contracts tend to be long (up to 20 years) prohibiting switching and, if prices are high, locking consumers into high costs²³.
- 30.3** Prices can also vary depending on a scheme's ownership model. The CMA found that higher prices and charges were associated with private networks and individually meters schemes, although it is also worth noting that privately operated networks often also tend to be individually metered²⁴. In social housing the overall cost of district heating can be under-reported due to local authorities absorbing maintenance costs, making potentially inefficient schemes seem more viable²⁵. Inefficient schemes increase costs and reduce trust in heat network technology, which is why CAS has called for robust technical standards to be in place to decrease such problems.
- 30.4** CAS' [Different Rules for Different Fuels](#) report suggested publishing prices, the development of price setting criteria, and a detailed review of the suitability of a price cap model in the district heat market²⁶. The CMA's investigation similarly recommended that a regulator considers publishing prices and that prices should be referenced against an appropriate price benchmark or at cost plus a reasonable profit margin, although it did not support price capping.

²¹https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/665444/HNCS_Executive_Summary_-_FINAL.pdf

²²https://assets.publishing.service.gov.uk/media/5af31b9640f0b622d18b2d3f/Update_paper_heat_networks.pdf

²³ Citizens Advice, District Heat Networks 2: Analysis of responses from private heat suppliers, link, p.5.

²⁴https://assets.publishing.service.gov.uk/media/5af31b9640f0b622d18b2d3f/Update_paper_heat_networks.pdf

²⁵ <https://www.staticwhich.co.uk/documents/pdf/turning-up-the-heat-getting-a-fair-deal-for-district-heating-users---which-report-399546.pdf>

²⁶ https://www.cas.org.uk/system/files/publications/different_rules_for_different_fuels_-_cfu_insight_report.pdf

b) Customer satisfaction with the system

- 30.5** In a district heating scheme, supply, distribution and generation are all often owned by the same organisation, meaning that once built, a scheme operates as an effective monopoly. This means that if a customer on a heat network is dissatisfied, they do not have the ability to switch supplier like gas and electricity consumers can, underlining the need for robust consumer protections.
- 30.6** Which?'s [Turning up the Heat report](#) in 2015 found that satisfaction varied significantly between schemes and that many felt prices were unfair, bills confusing, information insufficient, system performance unreliable, and the complaints process poor²⁷. [A survey](#) by BEIS in England and Wales in 2017 found that heat network consumers were, on average, as satisfied with their heating system as non-heat network consumers, but that some were more likely to lose heating or less likely to receive a bill²⁸. The CMA's investigation [concluded](#) that customers of private and local authority operated schemes appear most likely to experience a loss of heating. It also identified concerns relating to customer access to information about heating, and the frequency and content of bills²⁹. The Association for Decentralised Energy identified supplier reliability, supplier accountability, and the cost of heating as the main risks to customer satisfaction³⁰. [Research](#) by Citizens Advice found some owner occupiers were particularly dissatisfied with a lack of choice over their heating system, despite owning their property, and prepayment customers felt it was unfair to accumulate standing charges even in summer months³¹.

c) Lifecycle and overall efficiency of the technology

- 30.7** The CMA's market study identified two forms of misaligned incentives: where a heat network is the most cost effective way to meet planning requirements, but not the cheapest way to provide heating and hot water; and where developers try to cut upfront costs, resulting in higher ongoing operating and maintenance costs being passed on to consumers³². These can lead to poor choice and design of heat networks and a failure to consider its whole life costs. Older networks may also incur higher operating costs and be run less efficiently.
- 30.8** BEIS' research indicated that heat network consumers are more likely to experience over-heating than those not on heat networks³³. This can lead to energy inefficient

²⁷ <https://www.staticwhich.co.uk/documents/pdf/turning-up-the-heat-getting-a-fair-deal-for-district-heating-users---which-report-399546.pdf>

²⁸ <https://www.gov.uk/government/publications/heat-networks-consumer-survey-consumer-experiences-on-heat-networks-and-other-heating-systems>

²⁹ https://assets.publishing.service.gov.uk/media/5b55965740f0b6338218d6a4/heat_networks_final_report.pdf

³⁰

https://www.theade.co.uk/assets/docs/resources/Task%20force%20report_v7_web%20single%20pages.pdf

³¹ <https://wearecitizensadvice.org.uk/taking-the-temperature-on-heat-networks-cdcd7cbd61c1>

³² https://assets.publishing.service.gov.uk/media/5b55965740f0b6338218d6a4/heat_networks_final_report.pdf

³³ BEIS, Heat Network Consumer Survey, link, p.3.

behaviour, such as the opening of windows or use of electric fans. CAS' research recommended technical standards such as minimum and maximum temperatures, pressure controls, and annual reporting on the efficiency of schemes as measures which could help to minimise inefficient use³⁴.

31. What factors might inhibit uptake of the installation of heat networks?

31.1 [Research](#) by BRE, the University of Edinburgh and Centre for Sustainable Energy identified a wide range of barriers to the deployment of district heating networks³⁵. Barriers to local authority led schemes include customer scepticism, securing capital funding, inconsistent pricing, unreliable heat sources, upskilling procurement teams, and obtaining sufficiently skilled and affordable legal advisors and consultants. Many of these challenges are present in private sector led schemes, where securing customer acceptability and understanding, non-standardised contracts, and uncertainty of heat demand in new buildings, are additional challenges.

31.2 The Energy Technologies Institute also [highlighted](#) the need to attract investors who may choose other, more attractive options, the ability of consumers or other stakeholders to block a development during the consultation phase, the expectation that the new heat source will need to match or exceed existing heating systems, and the need to minimise negative consumer experiences³⁶. District heating is less common in Scotland than other heating sources, but the sector is expected to grow in line with UK and Scottish Governments targets. Without consumer trust and acceptance, consumers will have negative experiences, the technology will receive negative publicity, and meeting these targets will be more difficult. To forestall such problems CAS' [Different Rules for Different Fuels](#) report called for mandatory consumer protections for Scottish district heating consumers under a licensing system³⁷.

32. What could be done to further encourage the development of heat networks?

32.2 The various barriers inhibiting heat network development are set out in question 31 and steps to overcome them would include adopting a strategic approach to planning, providing reliable funding, improving skills and training, stimulating investment, and giving reliable advice to developers. However, the best way to secure certainty for investors, developers, and consumers alike is to introduce regulation. Heat networks are unlikely to be seen as an attractive development without consumer confidence, and this can best be secured by introducing mandatory consumer protections.

³⁴ https://www.cas.org.uk/system/files/publications/different_rules_for_different_fuels_-_cfu_insight_report.pdf

³⁵ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/191542/Barriers_to_deployment_of_district_heating_networks_2204.pdf

³⁶ <https://d2umxnkyjne36n.cloudfront.net/insightReports/District-Heat-Networks-in-the-UK-Final.pdf?mtime=20181105145836>

³⁷ https://www.cas.org.uk/system/files/publications/different_rules_for_different_fuels_-_cfu_insight_report.pdf

32.3 CAS' [Different Rules for Different Fuels](#) report sets out the protections we would like to see for Scottish heat networks consumers: the publishing and benchmarking of prices; minimum standards of regularity and accuracy for billing; support for vulnerable consumers and consumers in debt; access to redress; compensation for interrupted supply; rules around fault handling; technical standards to ensure efficient schemes; and clear, fair contracts³⁸. As it is not clear whether or how price controls could be implemented in Scotland, we would also welcome exploration of the viability of price controls, such as a price cap, and price setting criteria. Setting these standards is crucial to ensure the success and development of existing and new schemes, and suppliers should be supported to meet them.

33. Where and in which circumstances are heat networks the most appropriate low carbon solution in areas not using mains gas?

33.1 CAS' Off-Gas [research](#) found that in 2012-14, 90% of communal heating schemes in Scotland were in urban areas, compared to 10% in rural areas³⁹. While district heating schemes are generally powered by gas, in more rural areas further from the gas grid, alternative fuels such as biomass can be used. However, it is worth noting that the term 'off-gas' does not exclusively refer to rural areas, but also covers high-rise flats, dependent on electric heating, but not connected to the gas grid. Electric heating can be as much as three times more expensive than heating provided by an individual gas boiler⁴⁰. In 2017, 52% of those using electric heating were in fuel poverty, compared with 25% in Scotland as a whole⁴¹. Therefore, where electric heating is expensive, district heating can be considered as a potentially cheaper alternative. Where this is pursued, thorough analysis of prices should be conducted in the project design process to ensure it delivers cost savings and decreases fuel poverty.

33.2 Those on heat networks in 2012-14 were overwhelmingly in rented accommodation: 48% rented from housing associations; 32% from local authorities; 12% rented privately; and only 8% owned their property⁴². It is important to note, however, that in heat networks operated by housing associations or local authorities, the cost of maintenance and/or standing charges associated with heat networks may not be reflected in the fuel costs recorded in this data set or in EPC calculations. Therefore, direct price comparisons are difficult, although the Heat Trust is [working on](#) a heat

³⁸ https://www.cas.org.uk/system/files/publications/different_rules_for_different_fuels_-_cfu_insight_report.pdf

³⁹ https://www.cas.org.uk/system/files/publications/off-gas_consumers_methodology_cas.pdf

⁴⁰ https://www.cas.org.uk/system/files/publications/hard-wired_problems_-_delivering_effective_support_-_11-10-2018_0.pdf

⁴¹ <https://www.gov.scot/publications/scottish-house-condition-survey-2017-key-findings/>

⁴² https://www.cas.org.uk/system/files/publications/off-gas_consumers_methodology_cas.pdf

cost calculator to compare heat networks and electric heating costs, similar to its gas cost calculator⁴³.

34. What examples can be provided to show how readily heat networks can be moved to renewables – especially in those buildings with a high peak heat load?

34.1 Heat networks fuelled by low carbon sources are seen by the UK and Scottish Governments, the Climate Change Committee, and the Energy Technologies Institute as a key component of a cost-effective approach to decarbonising the UK's heat supply⁴⁴. Heat networks have the capacity to draw on a wide variety of low carbon or waste heating sources including: large biomass; municipal waste; waste heat from industrial activities; geothermal energy; latent heat e.g. from rivers and lakes; solar thermal; sewage networks; and waste heat from CHP plants fuelled by gas or renewables⁴⁵.

34.2 However, as yet most heat networks are not fuelled by low carbon sources. In 2017 around 7% of all heat networks used a low carbon primary fuel source, so there are still significant steps to be made to fully decarbonise⁴⁶. The Association for Decentralised Energy notes a possible tension between decarbonising heat and tackling fuel poverty⁴⁷. However, it noted that in the power sector low carbon options became cheaper when scaled up, and the same could happen with heat networks. There are also concerns about air quality where biomass is deployed, and the disruption of retrofitting low carbon technologies,⁴⁸ which will need to be addressed in the decarbonisation process.

35. What is your view on the continued extension of gas networks before low carbon alternatives to natural gas (e.g. hydrogen) are proven?

35.1 CAS support Ofgem's approach to continue with the Fuel Poverty Network Extension Scheme (FPNES) – a scheme created to help off-grid households (within 23m of the current gas grid) connect to the gas network by providing funding towards the cost of the connection- for the next regulatory period (2021-26). As recent CAS publications show consumers who rely on off-gas heating sources often face particular issues. In Scotland the latest figures show that 24.9% of all Scots are in fuel poverty, while rates for properties off the gas grid are higher at 38%. The fuel

⁴³ https://heattrust.org/images/docs/Heat-Trust-Annual-Report-Year-2-Folder_Heat-Trust-Annual-Report-Year-2_Final-Digital-v1.pdf

⁴⁴ DECC (2013) The Future of Heating: Meeting the Challenge ([link](#)); UK Committee on Climate Change (2016) Next Steps for UK Heat Policy ([link](#)); Energy Technologies Institute (2016) UK Networks Transition Challenges: Heat ([link](#))

⁴⁵ https://www.theade.co.uk/assets/docs/resources/Heat%20Networks%20in%20the%20UK_v5%20web%20single%20pages.pdf

⁴⁶ This was said at the Westminster conference – I can't find it anywhere else - see p.7 - [\\casdata\consumerfutures\01_Energy\00_Management\Marcus_Handover\District_Heating\Westminster_Transcript_2.pdf](https://casdata\consumerfutures\01_Energy\00_Management\Marcus_Handover\District_Heating\Westminster_Transcript_2.pdf)

⁴⁷ https://www.theade.co.uk/assets/docs/resources/Heat%20Networks%20in%20the%20UK_v5%20web%20single%20pages.pdf

⁴⁸ http://erpuk.org/wp-content/uploads/2017/10/ERP_heat_transition-Oct-2017.pdf

poverty rate for households with electric heating is at 51%⁴⁹. Our report *Hard-Wired Problems*⁵⁰ highlighted that the 11% of Scottish households using electric heating can pay up to three times as much as gas central heating for a whole house heating solution. For this reason and while gas remains the lowest cost heating option for households we support the connecting homes to the gas network where it is within the footprint of the current network.

- 35.2** While the FPNEs is focussed on individual connections for properties within the footprint of the gas network we think a more robust approach to testing whether lower carbon alternatives to gas grid extension is needed for beyond 2026 and for properties and towns beyond 23m from the current network. Solutions such as connection to a district heat scheme (with low carbon source such as a medium to large scale heat pump), through connection to individual heat pumps (with the appropriate grant support for low income households) or through Special Independent Undertaking (SIUs) should all be tested. Robust evidence would be needed on a case by case basis to understand the best option – both in relation to delivering a low cost and low carbon heat option.

It is also important to consider running costs as well as capital costs for any proposal for new heat solutions. Evidence from our CAB network has shown that in some district heat schemes where electric systems have been replaced by a communal boiler, the cost of paying for whole house heating delivered through the new scheme may be unaffordable for low income households who may have previously under heated their homes. Again financial support will be needed for some to ensure they can live in a warm home.

- 35.3** As noted in our *Pylons, pipes and People*⁵¹ report while the future of the gas network is debated and alternative gas sources researched (hydrogen) we think it is important that off-gas households receive the appropriate support. This should be targeted at fuel poor households. As stated in our report we recommend that:

"Fuel poor consumers who are off the gas grid and rely on expensive heating systems, such as electric heating, should be supported while decisions around the future of the gas network are deliberated. This could be achieved by providing financial support for the installation of lower cost heating systems or through energy efficiency measures."

⁴⁹ <https://www.gov.scot/binaries/content/documents/govscot/publications/statistics-publication/2018/12/scottish-house-condition-survey-2017-key-findings/documents/scottish-house-condition-survey-2017-key-findings/scottish-house-condition-survey-2017-key-findings/govscot%3Adocument>

⁵⁰ <https://www.cas.org.uk/publications/hard-wired-problems>

⁵¹ https://www.cas.org.uk/system/files/publications/cas_pylons_pipes_and_people_energy_networks_in_scotland_august_2018.pdf

36. How should wider decarbonisation demands, including for industrial processes, be factored in when considering gas grid extension?

37. What evidence can you provide on the economic and technical viability of the existing gas grid if it was maintained and operated with low gas flows?

38. What evidence can you provide on the further developments needed for future market readiness and deployment of the low carbon technologies covered above?

39. What evidence can you provide to show potential economies of scale and unit cost reductions that could be achieved through increases in annual levels of deployment of the low carbon heat technologies covered in this call for evidence?

40. What evidence can you provide of instances where installing a modern low carbon heating systems has also lifted households out of fuel poverty?

40.1 Low carbon heating may help reduce fuel bills in fuel poor homes, provided they are installed in well-suited properties, installed correctly, and paired with financial support and clear, easy to understand advice. CAS agrees with Community Energy Plus and the Eaga Charitable Trust that

"Low carbon heat cannot be a solution in its own right and needs to be part of an integrated agenda to tackle fuel poverty and wider poverty issues"⁵²

40.2 There are several schemes in Scotland that have installed low carbon heating systems in community buildings and households. Many of them are still in their infancy and have not been in operation long enough to yield reliable results. The village of Flintry in Stirlingshire is a particularly interesting case; in addition to a biomass district heating system that included a "wood fuel bulk scheme" that offered price secure sustainable fuel, the village has seen 89 renewable or low carbon heat installations, 27 of which were air source heat pumps and 18 of which were ground source heat pumps.

40.3 A [housing association project](#) in Cornwall installed heat pumps in off grid bungalows that were previously heated by electric heaters or oil boilers. Residents saved, on average, £188 per annum⁵³.

40.4 In our consultation response to Energy Efficient Scotland (June 2019), we laid out evidence that installing energy efficiency measures does not, on its own, significantly reduce fuel bills in most cases. Behavioural change is necessary to reduce energy use, and in most cases bills. A 2006 study of English households participating in the UK government's "Warm Front" initiative, which installed energy efficiency measures,

⁵² Community Energy Plus & Eaga Charitable Trust. *Low Carbon Heat and Rural Fuel Poverty: Lessons from Across Europe*. Pg. 8

⁵³ Kensa Contracting, Case Studies. Webpage. Available at: <https://www.kensacontracting.com/ground-source-review-coastline-wheal-vyvan/>

found that there was no reduction in fuel consumption in the homes after installation. The study attributed the lack of change to the “take back factor,” also known as the “rebound effect,” in which home holders use more energy after energy efficiency measures are installed because energy is predicted to cost less. Other contributing behavioural factors included opening windows more often or continuing to use the old heating system even after the new one was introduced, and overly simplistic modelling of energy efficiency in homes (the SAP methodology)⁵⁴ .

40.5 As noted in our [consultation response](#) to the Scottish Government’s second consultation on Local Heat and Energy Efficiency Strategies,

“There is a potential tension between decarbonising heat on the one hand and trying to tackle fuel poverty on the other... In decarbonising heat it is therefore important to strike the right balance between short-term and long term affordability to avoid any rapid increase in consumer bills in line with technological changes, particularly amongst those least able to pay.”⁵⁵

Any strategy to use installation of low carbon heating systems to alleviate fuel poverty should take these concerns into consideration.

41. How should we phase in the policy framework in order to better support the decarbonisation of heat supply to off gas buildings? Please reflect on whether or not a similar approach to that proposed for energy efficiency remains the best option.

41.1 CAS believes that financial support for the decarbonisation of heating should be made an infrastructure priority. We support an area based, phased approach that will target fuel poor homes first, ensure high quality standards, and avoid premium pricing in rural areas like the Highlands and Islands. Any policy framework proposed by the Scottish Government should be clear and consistent in the long term to encourage consumer confidence and investment. Funding for decarbonisation of heat supply should be offered first through targeted support to the least (un)able to pay and the most vulnerable.

41.2 1.6 million homes in Scotland that are off grid are within 23 meters of the gas grid, making it technically feasible for them to be connected. The Scottish Government should give a clear route map that will lay out what the future of the energy network and the gas grid will be - does the UK Government intend to expand the reach of the existing gas network, or will the Scottish Government focus investment on a greener electricity grid and infrastructure for hydrogen (instead of conventional gas)? Should off grid properties invest in electric heating, connect to the grid in anticipation of

⁵⁴ Hong, S., Oreszczyn, T., Ridley, I. (2006). The impact of energy efficient refurbishment on the space heating fuel consumption in English Dwellings. *Energy and Buildings*. 38. Pp. 1171-1181. <https://www.sciencedirect-com.ezproxy.is.ed.ac.uk/science/article/pii/S0378778806000399>

⁵⁵ Citizens Advice Scotland (2018) pg. 5

<https://www.cas.org.uk/publications/cfu-respond-scottish-government-consultation-scotland%E2%80%99s-energy-efficiency-programme>

hydrogen, or invest in biomass, betting that biomass fuel will remain readily available and locally affordable in the future? These as yet unanswered questions have a bearing on what type of heating system is the cheapest to run and the best overall investment for off-gas properties.

41.3 We believe that many of the recommendations we made regarding consumer protections in our Energy Efficient Scotland Accelerated Targets consultation response (2019) would be beneficial in building a low carbon heat policy framework. Namely: a procurement process that identifies a framework of several local contractors able to install low carbon heat systems, which can pool resources and create economies of scale. This would serve multiple purposes:

- First, to give householders reassurance that a local installer could more readily attend to future maintenance issues;
- Secondly, one might assume that people have more trust in local installers; and
- Thirdly, it could help to boost local economies and employment levels

42. How could Local Heat & Energy Efficiency Strategies (LHEES) help to prioritise early phasing of uptake of low carbon heat in areas not currently using mains gas?

42.1 Phasing in decarbonisation of heat supply to off grid buildings as a part of the Local Heat and Energy Efficiency Strategy (LHEES) would allow a local approach, creating economies of scale and establishing networks that could identify and connect interested consumers. We have [previously recommended](#) that LHEES have clear national targets for both energy efficiency and low carbon heat that are easily translated into a local approach⁵⁶. Prioritising off gas homes as part of LHEES would be in line with fuel poverty and energy efficiency goals, as off gas homes are more likely to be energy efficient and less likely to have had energy efficient improvements made⁵⁷.

42.2 The Energy Efficient Scotland LHEES pilot program evaluation found that long term (multi-year) funding for area based programs helps support uptake of domestic energy efficiency measures through building a positive reputation in communities. Programs like LHEES could provide improve consumer knowledge and attitudes towards low carbon heat technologies, low levels of which currently represent a significant barrier to consumer uptake.

42.3 Energy efficiency works offer an opportunity to install low carbon heating systems without significantly adding to the disruption. Our *Hot off the Grid* report found that most landlords make improvements to heating systems as part of a cyclical repair

⁵⁶ Citizens Advice Scotland, (2018) Consultation Response, LHEES and District Heating <https://www.cas.org.uk/publications/cfu-respond-scottish-government-consultation-scotland%E2%80%99s-energy-efficiency-programme>

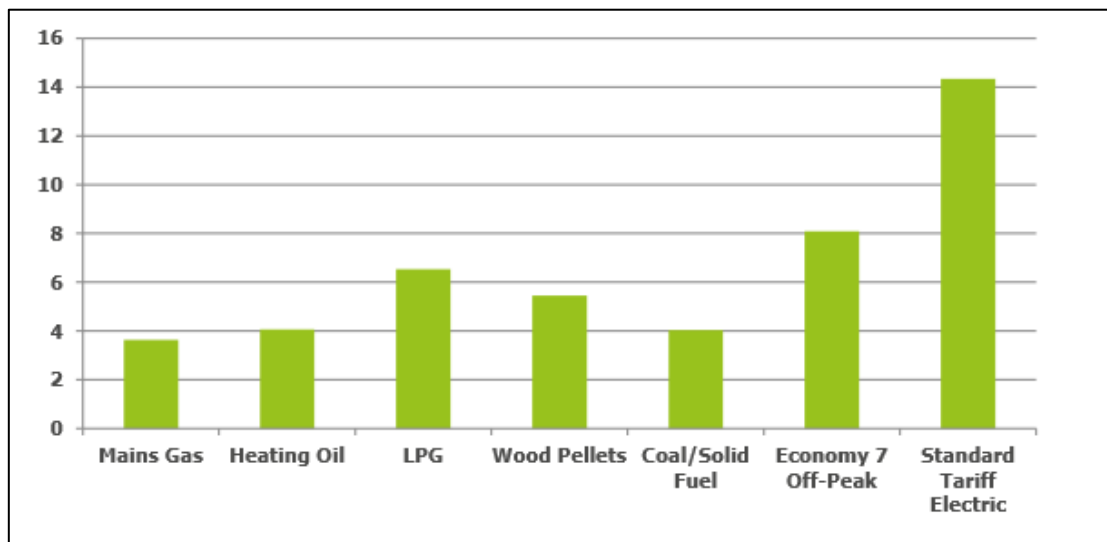
⁵⁷ Citizens Advice Scotland (2018) *Off Gas: Updated information on Consumers without mains gas heating*. https://www.cas.org.uk/system/files/publications/2018-08-15_off-gas_report_final_0.pdf

process when an old system reaches end of life or they are required to comply with regulation like EESSH. When selecting technologies, landlords consider installation costs, maintenance, and tenant interaction⁵⁸. Creating a procurement process that makes identifying a quality assured local contractor who would also be available to carry out maintenance would make installing low carbon heat a more attractive proposal to landlords, and presumably owner occupiers, especially if a low carbon heating system could be installed at the same time as any required energy efficiency upgrades.

43. How should the deployment of low carbon heat be funded? I.e. what relative contribution should come from central public funding, energy consumer's bills and private recipient funding?

43.1 A range of grants, tax incentives, and public funding should be offered to support the wide scale deployment of low carbon heat. Grants and tax incentives should be made available to owner occupiers as well as social and private landlords to encourage uptake, while public funding should be made available to low income households and those least (un)able to pay. Currently, levies on energy bills are only on electricity bills. There is a strong correlation between fuel poverty and electric heating, and as electric heating currently costs, on average, three times the cost per unit as mains gas (see figure 2)⁵⁹, it would be unfair to put an additional levy onto consumers that already pay higher bills.

Figure 2: Average heating fuel cost per kWh, March 2018⁶⁰



43.2 Our recent omnibus survey on Scottish Consumer attitudes to EPCS and energy efficiency regulations found that the most popular incentives for Scottish owner

⁵⁸ <https://www.cas.org.uk/publications/hot-grid>

⁵⁹ https://www.cas.org.uk/system/files/publications/hard-wired_problems_-_delivering_effective_support_-_11-10-2018_0.pdf

⁶⁰ Data from Energy Savings Trust – average cost over twelve months. Graphic from CAS report *Hard Wired Problems* available at https://www.cas.org.uk/system/files/publications/hard-wired_problems_-_delivering_effective_support_-_11-10-2018_0.pdf

occupiers (n=593 weighted base) to upgrade the energy efficiency of their home were grants from the Scottish government to cover part of the cost of the measure (62%), a council tax rebate of £500 in the first year following the upgrade (49%) and knowing how much could be saved on fuel bills (42%)⁶¹. Further research would be required to know for sure if the same incentives would be as motivating for low carbon heat, but it would be logical to assume that they could be.

44. What is needed to encourage private investment in low carbon heat?

45. Of the current sources of finance which are currently available for low carbon heat, which are working well and which are not? Are there successful examples of attracting private sector finance to support low carbon heat deployment that should be explored?

46. How should off gas buildings be assessed for their suitability for low carbon heat technologies?

47. To what extent should the assessment of suitability for low carbon heat relate to the proposed Energy Efficient Scotland assessment?

47.1 CAS welcomes a “whole home” assessment approach encompassing both energy efficiency measures and low carbon heating systems. To reiterate points made in our EES Accelerated Targets consultation response, we would like to see a one-stop-shop for EES to provide advice, assessments, directory of installers, to report complaints and to look for redress. As part of this “one-stop-shop,” the suitability of low carbon heat for a property could be provided as part of impartial advice about the entire home offered by independent, accredited consultants

47.2 It will be important under EES that heat pumps and other low carbon technologies are only installed in suitable, insulated properties using accurate heat loss calculations by accredited, quality marked installers. We believe that it is more beneficial for Scottish homeowners to install energy efficiency measures before or at the same time as a new heating system:

“A ‘fabric-first’ approach is a well-established view: improve the insulation of a property first before changing the heating system to avoid wasted heat and associated carbon emissions, and effectively future-proof a property.”⁶²”

47.3 Our *Hot off the Grid* report performed energy modelling (using RdSAP) before and after the installation of low carbon heating to determine potential energy bill savings

⁶¹ Respondents could select multiple answers. The question was: As a reminder, by ‘upgrade the energy efficiency’, we mean reduce the amount of energy required for your home...Still thinking about your MAIN home (i.e. the one you spend most of your time in) which, if any, of the following forms of support would motivate you to further upgrade the energy efficiency of your home? (Please select all that apply. If nothing in particular would motivate you to upgrade the energy efficiency of your home, please select the “not applicable” option)

⁶² CAS response, Energy Efficient Scotland Accelerated Target consultation

for three property archetypes most common in rural off-grid areas: 4-bed detached stone house (pre 1919), 3-bed semi-detached cavity wall house (1965-75), and 4-bed detached timber frame house (2003-07) (see figure 3)⁶³. The modelling took into account how changing the size, location, and level of insulation of each property would affect the costs of each technology. Including a similar service in the Scottish Assessment would allow homeowners to estimate fuel bill savings and incentivize them to see low carbon heat technologies as viable options. Required behaviour changes could also be outlined as part of the model explanation.

48. What wider information and advice should be supplied to inform consumers seeking to install low carbon heat supply in buildings that are off gas?

- 48.1** Reliable, accessible, and easy to understand information and advice should be made available throughout the entire process from decision making to post-installation support and maintenance. An independent organization such as HES should be available to interested householders to offer guidance, in home if necessary, about available financial mechanisms that can help offset cost, installation and running costs, suitability of each technology to the property, and system use.
- 48.2** Guidance on system use and behaviour is essential to build consumer trust and confidence in low carbon heat systems. Systems like heat pumps that are sensitive to drops in temperature from an open window or draughty house could result in high electricity bills for off gas consumers unaware of how to use their new system. Many off gas consumers have two or three rate electricity meters, which are unusable for heat pumps, but do not know to have their meter replaced, resulting in erratic and costly electricity bills.

Case Study: In 2017, a Local Authority installed more air source heat pumps than any other council (1,483). The heat pumps were installed in properties that had previously used storage heaters and two or three rate meters. The Council did not inform clients that a new meter capable of supporting the air source heat pump would need to be installed. Clients were not shown how to use their heat pumps, which meant many of them were not using the technology efficiently and were driving up their fuel bills. One Client was topping up her prepayment meter more than £100 a week.

49. What evidence can you provide on the role that regulation could play in helping to support uptake of low carbon heat in existing buildings (domestic and non-domestic)? What form should this regulation take?

50. To what extent could any regulation to support uptake of low carbon heat in existing buildings link to the already-proposed Energy Efficient Scotland energy performance standards? How could a link be made?

⁶³ <https://www.cas.org.uk/publications?title=Hot+off+the+grid&spotlight=12&type=All&=Search>

50.1 While CAS supports the uptake of low carbon heat technologies, especially as low carbon heat systems have the potential to reduce fuel poverty in off gas areas, we do not support any regulation requiring action without the necessary financial support, education, and advice. Additionally, as we outlined in our first and second EES consultations,

"any new regulation of homeowners to implement minimum standards of energy efficiency would need to be preceded, or at least accompanied by, substantial efforts to lead and transform public opinion – whether through education, communications and marketing, or awareness-raising⁶⁴."

The same caveat applies to low carbon heating systems.

50.2 We hold many of the same reservations about regulating uptake of low carbon heating for owner occupiers as we do for regulating minimum energy efficiency standards for owner occupiers; details of these stipulations can be found in our response to the EES accelerated targets consultation. Briefly, CAS believes any regulation should be accompanied by:

- A third category of exemption beyond "technically feasible" or "cost effective" on compassionate grounds. The wording could be something along the lines of "where it is inappropriate to enforce regulation for compassionate social reasons." The exemption would be verified by an independent third party and would apply to those who are elderly and/or with mental health issues who may find it incredibly stressful to prepare for and witness disruption to their home
- The Scottish Government may wish to consider a hand-holding service to effectively project manage the works, and take account of these sensitivities
- An expansion of the role of Home Energy Scotland, above and beyond a national advice service, to include accreditation of DEAs and installers, source of quotes, project management of jobs for vulnerable householders, and the central point of contact for complaints and redress

51. How should the Scottish Government respond to the CCC's advice and the UK Government announcement in the Spring Statement that new buildings constructed now should "accommodate low carbon heating from the start"?

52. Have you encountered any specific examples of barriers to the installation of low carbon heating systems in new buildings?

53. Can you provide evidence on the comparative cost of installing low carbon heat solutions in new buildings rather than high carbon systems?

⁶⁴ https://www.cas.org.uk/system/files/publications/cfu_submission_to_sg_consultation_on_seep_-_may_2017.pdf

54. Can you provide evidence on the comparative cost of installing low carbon heat solutions in new buildings compared to retrofitting to install low carbon heat at a later date?

55. Are there particular actions that you would identify for consideration as part of any action to 'future proof' new buildings for low carbon heat retrofit?

56. In light of the reservation of consumer protection powers, how else could the Scottish Government ensure consumer protection on a robust basis? For example, through commercial agreements.

56.1 We support the approach to developing regulation of heat networks across the UK and whilst consumer protection is reserved we support the Scottish Government's intention to continue to engage with the UK Government about how best to protect Scottish consumers. A solution may be to work with the UK Government to establish a UK framework that would then enable the Scottish Government to include comprehensive consumer protection measures within a licensing scheme.⁶⁵

56.2 The Scottish Government does not have the power to legislate for any new consumer protections, but has proposed to codify protections that exist in UK and EU law under guidance alongside a licence, and we continue to support this.

56.3 The development of a robust consumer protection framework and Quality Mark through Energy Efficient Scotland should cover both energy efficiency and low carbon heat. We have previously called⁶⁶ for the Scottish Government to put in place a statutory licence which should include Fair Heat Contracts, providing clear information on a range of consumer protections including joining and leaving rights.⁶⁷

56.4 Any new proposals should build on the work of groups such as the Heat Trust to strengthen consumer protections and ensure that standards are at least on a par with electricity or gas sectors.

56.5 With the exception of community-owned district heating schemes, such as that at St Bride's Community Centre in Douglas, South Lanarkshire, the decision to build a district heating scheme is not normally directly taken by the consumers who will use the scheme. Similarly, investors, local authorities, housing associations, private developers, or operators tend to dictate investment in, building and operation of a scheme. The way schemes are incentivised should therefore be clearly linked to improved consumer outcomes from their inception, such as alleviating fuel poverty and meeting high technical standards. Improving consumer engagement and advocacy at all stages of development and operation would help to ensure schemes

⁶⁵ Consumer Futures Unit, *Different Rules for Different Fuels*, [link](#).

⁶⁶

https://www.cas.org.uk/system/files/publications/cfu_response_scottish_government_lhees_and_district_heating_consultation_2_final_190218.pdf

⁶⁷ Consumer Futures Unit, *Different Rules for Different Fuels: Insight Report*, [link](#), p. 16.

are designed around the users of district heat. This would help to meet the Scottish Government's Energy Strategy aim to prioritise consumer engagement and protection.⁶⁸

56.6 For a licensing scheme to be effective it should be designed around consumers, and the way they will understand and engage with it. We note the Scottish Government's proposal to draw together existing UK consumer protections into guidance and the expectation that this framework will be complied with. However, in the case of district heat we have come to the view that a mandatory licence would be more likely to be effective. We reach this view for two main reasons. Firstly, there is an existing voluntary scheme operated by the Heat Trust, which has only had low take up in Scotland. Secondly, because of the disparate nature of the organisations supplying district heat. It is important that, whatever the nature of their supplier, consumers know that they have the same rights across Scotland. Our legal opinion suggested that it is within the Scottish Government's devolved competency to go further than setting out voluntary guidance and to enshrine consumer protection in a formal, compulsory, enforceable, statutory licence including measures around areas like billing.

57. What actions should we undertake to ensure the Scottish supply chain has the skills and capacity to capitalise on the future increase in demand for the installation of low carbon heat?

⁶⁸ Scottish Government, *Energy Strategy*, [link](#).