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Home energy information, advice, and guidance
Research report

Completed by Energy Systems Catapult for the Department for Business, Energy & Industrial Strategy prior to the general election in the United Kingdom in July 2024. As such, any references to government policies, commitments, or initiatives may reflect the stance of the previous administration and were accurate at the time of fieldwork and writing.

Energy Systems Catapult (2021)

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Glossary

- **BIT:** Behavioural Insights Team.
- **CSE:** Centre for Sustainable Energy.
- **CORGI:** Council for Registered Gas Installers (replaced in 2009 with the Gas Safe Register).
- **Digitally excluded:** having little or no access to, or confidence in using, the internet.
- **EPC:** Energy Performance Certificate.
- **ESC:** Energy Systems Catapult.
- **EV:** electric vehicle.

Executive summary

To achieve the UK's net zero target, virtually all homes need to be decarbonised by 2050. A critical part of delivering this will be ensuring homeowners have access to information, advice, and guidance to help them improve the energy performance of their home and transition to low-carbon technology. Qualitative research with industry experts and homeowners (including a sub-sample of digitally excluded homeowners) explored:

- Perceptions of the information, advice, and guidance currently available, including:
    - Which sources homeowners find, use and view as trustworthy.
    - What information, advice, and guidance are perceived as most important.
    - Gaps in the information, advice, and guidance available.
- The customer journey of searching for information, advice, and guidance and how experiences during this journey impact behaviour.
- What types of information, advice and guidance would encourage homeowners to decide to invest in energy efficiency measures and low-carbon technology, and their openness to paying for that advice.

Findings from interviews with digitally excluded homeowners were largely similar to findings from discussions with other homeowners. Results from these two samples have been combined in this report, unless otherwise stated.

Homeowners felt that for them to research and consider installing energy efficiency measures and low-carbon technology, they would first need to be aware of the general need to decarbonise homes. Although they felt that environmental benefits alone would not drive a purchase, understanding the contribution that home energy use makes to carbon emissions would help them appreciate the need for action and encourage them to consider when and how they could take steps to decarbonise their homes. They also felt that without such a change being mandated, people would not act. They felt a visible date for banning high-carbon heating systems would help homeowners prepare for a transition in advance, reflecting on the perceived effectiveness of extensive media coverage of the upcoming ban on petrol and diesel cars in raising awareness of how polluting these vehicles are[1]. Industry experts elaborated that clear messaging and policies would be needed from the government to prompt industry and consumer action.

When looking for information about energy efficiency measures and low-carbon technology, participants in the online discussions reported that they typically found information from two types of online source: energy advice websites and companies who made or installed energy efficiency measures and low-carbon technology. Generally, energy advice sites were trusted as they were perceived as *"not trying to sell anything"* and offering advice for a societal benefit. On the other hand, manufacturers' and installers' websites were not trusted as homeowners felt these companies would have a vested interest in trying to sell something

[1] Participants referred to the 2030 phase-out date for the sale of new petrol and diesel cars and vans, i.e. Step 1 of transitioning to zero emission cars and vans.

which may or may not be suitable for their homes.

While homeowners felt that online searching highlighted abundant information, they felt it focused on explaining what different energy efficiency measures and low-carbon technologies are. They found little, if any, explanation of how homeowners might benefit directly, nor did they find guidance on what is needed for an individual's home and circumstances.
Homeowners felt unable to build much understanding about the available measures and technology beyond the environmental benefits and the financial costs.

Energy efficiency measures and low-carbon technology were often felt to be prohibitively expensive and participants in the online discussions wanted to understand how long it would take them to recoup the upfront cost. Raising awareness of the availability and suitability of financial support could help reduce the size of the barrier that upfront cost represents.
Currently, some assume - perhaps incorrectly - that they would not be eligible for this kind of support. Others are deterred by the perceived complexity of the application processes.

Homeowners wanted easy-to-understand, relevant information that they could trust. They suggested the government could provide such information, though some also suggested it could be provided by charities, non-profits or organisations jointly supported by industry (where they felt expertise lies) and the government (where they felt motive lies).

Homeowners felt that online research would not provide sufficient information to help them decide which energy efficiency measures and low-carbon technology would be suitable for them. They wanted an expert—someone who does this *"as their craft"*—to visit their home and advise on a package of upgrades suitable for their household and circumstances. Homeowners suggested this bespoke advice would give them the confidence they need to invest in and commit to these changes.

Homeowners wanted to see positive case studies of energy efficiency measures and low-carbon technology installed and working well in homes like theirs. They felt this would give them confidence that the measures and technology could give them the outcomes they want.

Some would be willing to pay for a bespoke, detailed plan, feeling it would give them confidence that the recommended energy efficiency measures and low-carbon technology would be suitable for their homes and give them the output their household needed. Others opposed the idea of homeowners paying for this advice, feeling that if the government were to require homeowners to make changes then it should provide homeowners with advice free of charge. There was also some acknowledgement that not all homeowners would be able to afford such advice.

Recommendations put forward by homeowners include:

- Encourage homeowners to consider installing energy efficiency measures and low-carbon technology at relevant touchpoints, for example when they are considering other home renovations.

- Make it easy for homeowners to find clear, relevant information.
- Make it easy for homeowners to understand what financial support is available and access that support.
- Reassure homeowners of support in the event of issues with installation and performance.

Introduction

To achieve the UK's net zero target, virtually all homes need to be decarbonised by 2050. A critical part of delivering this will be ensuring homeowners have access to information, advice, and guidance to help them improve the energy performance of their home and transition to low-carbon technology. Participants in the UK Climate Assembly felt that in decarbonising homes, it would be important for householders to choose the solutions best suited to them[2]. In order to do that, householders need to understand the benefits and costs that different measures and technology might represent.

Previous consumer research has indicated that people struggle to find the information and advice they need when looking into energy efficiency measures and low-carbon technology. Citizens Advice found that when they start to explore these measures and technologies, many people struggle to find relevant information about what is available and find it difficult to work out which technologies to install[3]. It also reported that a lack of relevant and useful information from trusted sources meant that people could feel that they are *"left to their own devices to become experts"*. Feeling unable to navigate the information available could lead people to drop out of the process of looking for these measures or installing something that is not suitable for their home and household.[4]

Industry research has previously recommended bespoke advice, tailored to individual households, to encourage householders to embark on retrofit journeys. The Green Finance Institute recommended the provision of Building Renovation Passports, a tool for delivering bespoke roadmaps outlining individual homes' retrofit pathways. Such a tool could be supported with connections to relevant contractors who could install energy efficiency measures and low-carbon technology and information about funding sources to help people identify types of suitable financial support.[5] The MCS Charitable Foundation also reported the need for advice tailored to individual homes and households and highlighted that the factors driving individual households to make such changes to their home are varied.[6] MCS recommended a one-stop-shop that, among other things, could provide home energy assessors who could advise on and develop a plan for the installation of relevant measures and technology for individual homes. Such a one-stop-shop could also help connect householders with installers and suppliers and find suitable finance options.

The current research sought to explore homeowners' experiences of searching for information, advice, and guidance; their perceptions of what was available; and how well they felt what was available would equip them in deciding what energy efficiency measures and low-carbon technology would be suitable for them and their homes.

[2] Energy Efficiency of Existing Homes: Fourth Report of Session 2019-2021 (2021); *House of Commons Environmental Audit Committee*
[3] Home Truths (2021); *Citizens Advice*
[4] Navigating Net Zero (2021); *Citizens Advice*
[5] Building Renovation Passports: Creating the pathway to zero carbon homes (2021); *Green Finance Institute*
[6] Energising Advice (2020); *MCS Charitable Foundation*

Qualitative research was conducted with industry experts and homeowners, including a subset of digitally excluded homeowners, to explore:

- Perceptions of the information, advice, and guidance currently available, including:
    - Which sources homeowners find, use and view as trustworthy.
    - What information, advice, and guidance are perceived as most important.
    - Gaps in the information, advice, and guidance available.
- The customer journey of searching for information, advice, and guidance and how experiences during this journey impact behaviour.
- What types of information, advice, and guidance would encourage homeowners to decide to invest in energy efficiency measures and low-carbon technology, and their openness to paying for that advice.

Method

Qualitative research methods were used to explore the perspectives of industry experts and homeowners. These methods were chosen to allow for the exploration of individuals' motivations, attitudes, and experiences, and the extent to which these influenced their needs and behaviours when searching for and using information, advice, and guidance.

This research collected the views of both industry experts and homeowners. The latter included a subset of digitally excluded homeowners. Expert interviews offered an opportunity to gather industry perspectives on the availability and suitability of current information, advice, and guidance and to understand the evidence driving these views. Discussions with homeowners sought to understand individuals' experiences of searching for information, advice, and guidance, providing an opportunity to explore and illustrate the extent to which expert interviews reflect real-life experiences.

Expert interviews

Expert interviews were conducted with specialists working in areas relating to consumer advice on home retrofit. These interviews gathered views on:

- Homeowners' retrofit journeys.
- Perceived opportunities to maximise the impact of information, advice, and guidance on consumer behaviour.
- The role of different sources of information, advice, and guidance.
- Discussions also explored why experts held these views and asked experts to highlight relevant evidence that they were aware of.

Ten experts with knowledge and experience of the home retrofit area were invited to take part in interviews. These experts spanned different areas of expertise, including the following:

- Customer advice and policy.
- Heating engineers and installers.
- Building science.
- Local authority energy strategy.
- Energy standards/policy.
- Landlord association.

Experts were identified through the Department for Business, Energy and Industrial Strategy and Energy Systems Catapult (ESC) networks. They were invited to take part in one-to-one phone interviews, each lasting 45–60 minutes.

Homeowners

Three online discussions were run with homeowners, each lasting two hours and attended by between 5 and 9 owner-occupiers (total *n*=22; each participant attended one discussion). Participants were selected from a pool who had registered interest in discussing home retrofit measures. An initial 15 participants were selected at random, and the remaining participants were then selected to ensure a mix across different criteria:

- Age.
- Gender.
- Income.
- House type (e.g. detached, mid-terrace).
- House location (e.g. suburban, rural).
- House age.
- House size.
- Household composition.

It is important to point out that the participants in this research were recruited from a pool of people who had registered interest in taking part in discussions about home energy advice. They may be more motivated by the environment and more engaged in the topic of home energy use than the general population. Their understanding of the link between home energy use and carbon emissions may be better-established than among the general population.

As the exploration of energy efficiency measures and low-carbon technology is not something everyone has experience in, participants were asked to spend about an hour on a pre- discussion task. They were asked to imagine they had an unspecified sum of money to spend on energy efficiency measures and low-carbon technology, and to look for information, advice, and guidance that they felt would help them make decisions about the options available to them. The brief shared with participants can be found in Appendix 1.

The discussion guide, based on a ‘deliberative discussion’ approach often used for citizens’ juries and assemblies, encouraged participants to:

- Reflect on the available information, advice, and guidance they had found during the pre-discussion task and the extent to which they felt it would enable them to make good decisions.
- Consider the gaps in the available information, advice, and guidance; and consider who they felt could fill these and how, and the implications of that on how they might perceive the information.
- Deliberate between themselves about the available and required information, advice, and guidance and its impact on their behaviour.
- Reflect on how the landscape of information, advice, and guidance could be improved and the implication of their suggestions on how they might use it.

Follow-up interviews

Six of the participants from the online discussions were invited to take part in an hour-long follow-up interview. Again, participants represented different ages, genders, house types, incomes, and household compositions. The purpose of these interviews was to gather more detail about participants' experiences of looking for information, advice, and guidance to refine and illustrate the customer journey.

Digitally excluded homeowners

Five further homeowners were recruited to represent the experiences of those who are digitally excluded. These homeowners were recruited on the basis of self-reporting as 'not at all confident' or 'not very confident' using the internet.

It should be noted that due to the low incidence rate of digitally excluded individuals, the ambition to recruit participants across a mix of ages and incomes were relaxed: all had a total household income below £40,000 and were aged 55 or over.

Participants took part in interviews individually, over the phone, with each interview lasting approximately one hour. They were asked to complete the same pre-discussion task as participants in the online discussions, though online sources were not signposted (see Appendix 2).

Results

The findings from the interviews with digitally excluded participants were largely similar to the findings from the online discussions. To this end, the results from these two samples have been combined for reporting and are referred to as findings from homeowners.

Where findings relating specifically to one or other sample are reported, the participant group is specified.

Homeowners felt that awareness and understanding of the carbon emissions context would prompt them to act

Homeowners felt that information about the carbon emissions context was important to prompt them to consider energy efficiency measures and low-carbon technology in the first place. Without this prompt, they felt they would be unlikely to explore or consider the changes they could make to their home until another trigger, such as the decision to renovate their home, prompted them to do so. Some did not understand the link between home energy use and carbon emissions. Others who did understand the link did not necessarily realise the need for individual action, and would expect to hear this from the government. The example of the ban on petrol and diesel cars was frequently referred to, with need to switch to an electric vehicle (EV) at some point; some had already done so, while others had considered it but decided against an EV for now. It was agreed that if an equivalent transition was needed in terms of home heating systems, then a similar policy change and communication would be needed from the government. Homeowners also felt that the government should be leading by example, with some suggesting that new builds should be built with these measures and technology installed—this not being the case now was interpreted as reflecting a lack of urgency in the need to decarbonise homes and a lack of confidence in the measures and technology.

> *"If you take the example of the car: we've now been told that the petrol or diesel car are useless and they're going out and the electric car is the way to go. So it's been that simple and a lot of people are going to electric cars. But with the home heating we're not being told this is what to do so we're all skirting around outside thinking we don't know what to do."—online discussion participant*

Industry experts consulted in the research also felt the government should drive the net zero transition with clear messaging and policies, emphasising that it would not happen if left to the market or consumers.

> *"I can't see how […] market mechanisms are going to provide what's needed, because of the need for impartiality and trust and coordination and alignment with government policy, priorities, and targets."—industry expert*

Homeowners felt they would prioritise their own needs over environmental benefits

When first asked what would prompt them to look at energy efficiency measures and low-carbon technology, many homeowners initially mentioned concern about the environment and climate change. After further reflection, several homeowners said that while they wanted to do things that were good for the planet – and indeed awareness of the need to decarbonise homes might prompt them to *consider* making changes to their home - doing what was right for them was more important. They felt they would not install energy efficiency measures and low-carbon technology unless they would benefit directly. This is consistent with robust quantitative research that found that 90% of renovations were conducted to improve homes, not to improve energy efficiency or reduce carbon emissions.[7]

> *"As much as I can reduce some things to reduce my carbon footprint for the world, it's not stopping all the other things that are happening around me. So therefore, my focus has to shift on what's immediately important to us as a family."—online discussion participant*

Homeowners explained they would not want to be left 'worse off' for having installed these measures or technology for an environmental benefit, with 'worse off' meaning experiencing financial and/or other losses, such as having a less comfortable or less attractive home. Upon reflection, others agreed that while they wanted to do things that would benefit the environment, their priority was doing what was best for them and their loved ones.

> *"I think you should highlight the individual benefits as the thing and then 'and you also save the planet' at the end"—online discussion participant*

A few homeowners had little awareness of the contribution of home energy use to carbon emissions and felt that this would be essential to understand before they would even consider what energy efficiency measures and low-carbon technology to install.

> *"I wasn't really aware that homes were such polluters […] I'd be interested to know what specifically it would be, is it gas heating, is it electricity, you know, what causes this issue? As you assume it's big factories and aeroplanes which are the polluters rather than houses."—online discussion participant*

Home renovation could prompt homeowners to consider energy efficiency measures and low-carbon technology

Having acknowledged that concern for the environment alone would not prompt them to install energy efficiency measures and low-carbon technology, almost all homeowners agreed that they would consider making these changes as part of a home renovation project. Some elaborated that these projects - and the life events that can trigger them, such as buying a new house or having a baby - are often approached with energy and enthusiasm as

[7] Wilson, C., Chryssochoidis, G. & Pettifor, H. (2013) Understanding Homeowner's Renovation Decisions: Findings of the VERD Project. *UK Energy Research Centre*

people look forward to improving the space, function, appearance, and comfort of their home. This, coupled with the financial means to do the work and willingness to accept some disruption in the home, could facilitate the installation of energy efficiency measures and low-carbon technology.

This was also reflected in the expert interviews. Among the things that experts were aware triggered people to look for information, advice, and guidance were moving into a new home and/or making renovations and thinking about what else they could do at the same time. They also highlighted that changes in life circumstances, such as having a child, can raise awareness of the need for a change.

Initial online searches give an idea of the landscape and act as a stepping stone

The findings in this section are based on homeowners' descriptions of their experience of the pre-discussion task.

When looking for information, advice, and guidance, homeowners typically reported starting their searches online. For online discussion participants, this was how they would usually approach other purchases. Digitally excluded participants also searched online – with support from others – despite their lack of confidence in using the internet. For all homeowners, Google or other search engines were the typical starting point, though different search terms were used by participants in the online discussions compared to digitally excluded participants.
Digitally excluded participants tended to drop out of the online search process far earlier than those in the online discussion group.

The following two sections outline the findings from these two groups separately.

Homeowners are overwhelmed by the volume of information available, but find it difficult to find relevant information

The findings in this section are based on the experiences of participants in the online discussions. Findings from interviews with digitally excluded participants are covered in the next section.

Participants in the online discussions reported inputting broad, general search terms such as 'energy efficiency'. Given the large number of results, some tried to refine their search terms somewhat although these were still fairly broad (e.g. 'reducing energy bills'). At this stage, they seemed to have few if any expectations of what they would find or what they wanted to find; they did not set out with specific questions that they wanted answered, or specific things they wanted to know.

Most participants said they found the volume of information 'overwhelming' at this point. This sentiment was echoed in the expert interviews which emphasised that while there was a lot of information available, it was not necessarily easy for people to navigate or make sense of it.

The vast amount of available information and the realisation that it did not tell them what they felt they needed to know led to several participants acknowledging that they would find it very difficult to work out what would be suitable for them and their homes. A few focused subsequent searches on more familiar technologies—things like solar panels that they were already aware of. One participant felt that finding a lot of information quite easily could lead to people falsely feeling well-informed, which could result in poor decisions.

> *"You think you're an expert for the information you've got, but actually you're most probably quite dangerous at that point"—online discussion participant*

The combination of i) the high volume of information available, ii) participants often having limited knowledge of what to search for, and iii) the risk of feeling they know everything they need to know based on the information surfaced through limited searches, means there is a great risk of 'unknown unknowns' regarding less familiar technologies such as heat pumps.

Participants felt that search results largely directed them to two contrasting sources:

- General energy advice sites, e.g. Simple Energy Advice (SEA) and Energy Saving Trust, which typically focused on energy efficiency and the environment.
- Companies selling technologies to increase energy efficiency and reduce carbon footprint.

The motives of energy advice sites were trusted, mostly because they were perceived as *"not trying to sell anything"* and offering advice for a societal benefit. Some felt these sites offered useful advice on ways to reduce energy consumption, but others felt that the recommendations were often familiar measures that some of them had already installed, in particular insulation.

On the other hand, websites of companies offering energy efficiency measures and low-carbon technology were not trusted sources of information. Participants felt that these companies were motivated to sell and so would offer advice that helped them to do that, rather than advice that would help a customer find suitable options. Other concerns were also noted about how these companies tried to leverage people's trust in other sources: one participant felt that 'sponsored' posts on social media could not be trusted, while another felt that companies tried to imply an association with the government.

> *"They try to sound like a government off-shoot"—online discussion participant*

Some who visited these companies' websites mentioned that they could access generic information but that to get bespoke advice or quotes, which is what they wanted, they were asked to provide their contact details. This felt intrusive for a speculative search where they were not ready to commit to a purchase and participants were reluctant to have companies contact them. This chimes with established behavioural literature on small 'friction costs' discouraging completion of otherwise desirable behaviours.[8]

[8] Behavioural Insights Team (2014). EAST. *Four Simple Ways to Apply Behavioural Insights*.

> *"You don't know what they're really going to do with those details […] phone you back, or email, or whether they come around to visit"—online discussion participant*

With trusted sites offering some, but limited, value and other sites not trusted, several participants then looked at sites they are familiar with and trust already, in particular Which? and Money Saving Expert. Such sites are widely perceived as impartial and are often a go-to source for other purchases. One participant also noted the value in these sites having *"done some of the work for you"*, such as representing the information that is more relevant to their audience which, in the case of Money Saving Expert, may emphasise financial savings.

At this point, participants tended to find little relevant information. They felt that what they did find emphasised cost. In the case of sites like Money Saving Expert, this emphasis on cost might be driven partly by the nature of the site (i.e. advice about saving money). In other cases, such as the Which? website, there was an unmet expectation that cost would be considered in a broader context of whether the benefits offered meant that the cost represented value for money. This lack of information led many participants to feel that people like them - in similar homes and households and with similar circumstances - typically did not have this kind of technology. For some, this reinforced preconceptions that energy efficiency measures and low-carbon technologies were 'elitist'.

> *"It's elite. It's for upper class people who can afford it"—online discussion participant*

At this point, participants tended to weigh up the benefits and costs of energy efficiency measures and low-carbon technology. Having found very little, if anything, in the way of relevant benefits and with the information they had found focusing largely on costs (especially the upfront costs of heat pumps, which some felt were prohibitively high, particularly compared to the cost of a gas boiler which participants generally knew), several participants decided that they would not consider installing energy efficiency measures and low-carbon technology as the costs far outweighed the benefits they were aware of, which were almost entirely environmental benefits which they felt would not benefit them directly. This represents a drop- out point on the customer journey. Some reflected that they may reconsider these measures and technology in the future, for example if they were undertaking renovation work or if their existing heating system needed replacing. They also noted that at these points, they may have more information at their disposal about the benefits and costs. For example, they may know people who have installed such measures or technology who can help them understand the advantages and disadvantages of installing them. Participants also noted that costs may reduce as these measures and technology become more mainstream, or financial incentives might be available to encourage uptake, both reducing the size of the barrier that upfront cost currently represents.

Those who continued to search for information, advice, and guidance next tended to look for information about factors that could facilitate installation, namely:

- Tradespeople who could install energy efficiency measures and low-carbon technology.

- Financial incentives to help with the cost.

While participants' preferences regarding finding tradespeople tended to be either to ask their 'go-to' tradesperson or to take recommendations from friends and family, most felt that their regular tradesperson would not know about energy efficiency measures and low-carbon technology, particularly low-carbon heating, nor would they be trained to install them. Similarly, without friends and family who made these changes already, they would not be able to get suitable recommendations. Sites like Checkatrade were then viewed as a place where people could access reviews and make an informed decision based on others' experiences, recognising that installation companies would also want good press from these platforms. A couple of participants understood that some of these sites are backed by companies such as HomeServe who will offer support in resolving issues that arise. This appealed to these individuals as they felt it would be easier when resolving issues, trying to diagnose problems and chase tradespeople for resolutions.

As well as who could install energy efficiency measures and low-carbon technology, those who were continuing their search wanted to know what grants and incentives were available to them. Some assumed that these incentives were likely to be for low-income homes or those not in employment and that they would not be eligible for these (though they had not researched to confirm this). One such individual nevertheless researched financial support and was surprised to find a scheme that she would be eligible for, though it had taken some time to find. Others had looked at what was available but felt they would be deterred by the need to complete what was perceived as complicated paperwork with the potential to make mistakes.

At this point, participants felt that a substantial amount of time needed to be invested in researching how to get these measures and technology installed. They reflected that an individual's motivation would need to be sufficiently high to make this investment of time and effort worthwhile, otherwise people would stop searching at this point.

> *"I wouldn't—a lot of people wouldn't—have the time to spend researching all this"—online discussion participant*

As part of the pre-discussion task, participants had been asked to look for an example of someone who had installed energy efficiency measures and/or low-carbon technology before. It was at this point in searching for information, advice and guidance that several participants chose to do this, typically searching social media and blog for examples relevant to their homes and circumstances. Some reflected that they had done similar before with other home renovation projects and found these examples useful for highlighting ideas and cautions. For example, one participant had used YouTube to find examples of loft conversion projects prior to undertaking similar work in her own home. Another enjoyed reading blogs about homes similar to her Georgian property, as it gave her inspiration about changes she could make to her own home.

However, participants struggled to find examples and those that they did find were often felt to lack relevance to their own homes, households, lifestyles, and circumstances. Participants wanted to understand the experiences of someone in a similar home to theirs, with a similar household, life stage and financial situation—knowing that energy efficiency measures and

low-carbon technology have worked for these individuals (and learning from their experiences) would give people confidence in making similar changes to their own home. For a couple of participants, finding examples of large-scale property conversions (e.g. converting a farm building into a home) further reinforced the feeling that people who had homes and households similar to theirs did not tend to have low-carbon technology.

Negative accounts (i.e. where people have struggled with the installation process and/or struggled with getting the outcomes they wanted after an installation) have a strong negative impact. Unlike with more neutral or positive accounts, participants tended to be more instantly deterred by these accounts, regardless of whether they were relevant to their own circumstances or not. This imbalance between how participants interpreted positive versus negative stories likely reflects a degree of risk-aversion to new technologies where the benefits and potential detriments are uncertain.[9]

Digitally excluded homeowners also initially rely on online sources

Participants who were digitally excluded also started their searches online, though with the support of a family member who sat with them and conducted the search on their behalf. Despite a lack of confidence using the internet, one reflected that he would not know where else to start looking for information.

> *"I can't remember how I looked for things before Google"—digitally excluded homeowner*

Some digitally excluded participants explained they were able to use the internet if they needed to, but part of their lack of confidence and willingness to use the internet was that they found it difficult to navigate the information available and to work out what could and could not be trusted. One participant felt comfortable using her computer to browse and buy clothes, but would feel very nervous about using the internet to research things that she was not familiar with, such as these technologies. She felt it would be much easier to ask someone she knew instead, such as someone in her street who has solar panels. Another participant had a neighbour who had a heat pump and said he planned to ask him about it next time they got together. They felt that asking people would make it easier to get the information and advice they needed: asking someone they knew meant that that person was likely to give a response that was already somewhat tailored to them.

As highlighted by participants in the online discussions, digitally excluded participants also wanted to understand what technologies would be suitable in their homes. Two had neighbours who already had relevant technology installed: one had a neighbour who had installed solar PV, and another had a neighbour who had a heat pump. That their neighbours had installed these technologies on homes similar to theirs led them to think that the technologies would therefore be suitable for their own homes.

In contrast to the online discussions, where participants used broad, generic search terms, the digitally excluded participants made a more conscious effort to use discerning search terms.

[9] Qiu, Y., Colson, G., & Grebitus, C. (2014). Risk preferences and purchase of energy-efficient technologies in the residential sector. *Ecological Economics*, *107*, 216-229.

They felt that to get something useful from a search, they would need to narrow down what they were searching for; *"rubbish in, rubbish out"* as one participant summarised. They appeared to be more conscious that they did not know what they wanted to find from their search; more aware that there were 'unknown unknowns'. They were not confident in their ability to navigate and evaluate online search results generally, and explained they felt even more uncomfortable evaluating the results that an ill-defined search might return. They used narrower search terms than online discussion participants, particularly trying to refine results to energy efficiency measures and low-carbon technologies that they were already aware of. Nevertheless, they were still not confident that the search terms they used would return useful information. They felt overwhelmed with the amount of information they found and did not feel able to navigate this.

They also did not have a strategy or usual process that they followed when searching for information online. As well as not knowing what to search for, they found it very taxing to work out how to search for information. This, in combination with feeling overwhelmed by search results, led to them stopping their search sooner than those who took part in the online discussions. Most digitally excluded participants opened a few of the initial search results before feeling overwhelmed at having to navigate more and dropping out of the process. One participant who did try to navigate the search results explained that she clicked on results that felt familiar:

> *"It's like looking for jumpers […] I see one I like and I click on it. So, if I see something I know, I'll click on that."—digitally excluded homeowner*

A tendency of digitally excluded participants to not explore search results and to ask people who they know have these energy efficiency measures and low-carbon technologies could limit their awareness of what might be available.

There are places homeowners chose not to look

Most homeowners chose not to consult energy provider websites, feeling that these businesses would not be motivated to help customers reduce their energy consumption. A small number of participants in the online discussions did look at energy provider websites but did not find them useful: one found only a paragraph of generic information about what the company was doing to help tackle climate change and another couple mentioned that they found suggestions about measures (e.g. insulation) that they already had in place.

Homeowners found little information about how they might benefit from energy efficiency measures and low-carbon technology

Benefits like a warmer house and cheaper bills were important to highlight and homeowners felt this was a clear gap in the information they found. Similarly, the experts interviewed felt that people needed to be given better reasons to change to low-carbon heating and improve their homes' energy efficiency—environmental reasons were not enough.

> *"Everyone, I think, would genuinely want to save the planet but at what cost to the individual? I think you should highlight the individual benefits as the thing and then 'and you also save the planet' at the end […] 'if you do this you will save this amount of money in the long run or you will be warmer in your house or whatever, you'll be able to sell your house easily'."—online discussion participant*

Specifically, homeowners wanted to understand what would work not just for their home, but for their household, lifestyle, and circumstances, including budget. One also felt it would be important for advice about measures to *"meet my objectives"*. People may have different motivations in mind when considering installing energy efficiency measures and low-carbon technology, so it would be important for advice to reflect this too.

Homeowners also wanted more information about cost. They had all identified some costs for various energy efficiency measures and low-carbon technology as part of the pre-discussion task. There was a theme that this was the only thing they could easily find information about but even then, it was not necessarily presented in a useful way. Effectively the only thing many homeowners felt they understood about energy efficiency measures and low-carbon technology propositions was that they would help reduce carbon emissions, but at a high financial cost to homeowners.

As part of the pre-discussion task, most homeowners had identified installation costs and a few had found mention of running costs (often personal accounts, such as electricity bills increasing). While this did inform decisions (typically that a measure or technology was too expensive, given the lack of relevant benefits) several highlighted that what they would want to know is the return on investment. Some said they would calculate payback time themselves (if they could find information about the technology lifespan) while others wanted a breakdown of the upfront costs, running costs and how long it would take them to break even.

> *"An expert that will tell me, 'yes, solar panels would work for your property and they would reduce your carbon footprint by X, the longevity would be 30 years and you would recoup your outlay within the first five'. Those kinds of statistics, for me."—online discussion participant*

Some who thought they might sell their home in the coming years also wanted to understand the potential impact on their home's value (feeling it could be negative if people would not like an unfamiliar technology, though possibly positive if it might make it an attractive property for landlords). Some who thought they would stay in their property for a long time did suggest that it might not matter if they did not recoup the whole cost or it would take a very long time to do so if they understood what other benefits (e.g. a warmer home) they might experience as well. Expert interviews highlight that current information, advice, and guidance tends to centre around a message that retrofitting saves money on bills (but is expensive and the payback times are long).

It is worth highlighting that while upfront cost was a notable barrier, particularly for low-carbon heating (such as heat pumps) where they were typically compared to the cost of a gas boiler, some said they would be prepared to pay a bit more if they felt the value they would get from it

could justify that cost.

> *"I would compare it to some tyres on a car in that I will not change tyres if they don't need changing. If I went to a garage to buy new tyres and someone said, 'we've got these, it's double the cost, but you get three times as many miles out of it', I probably would. If he said it's twice the price and you'll probably get another 10% on top, I'd say absolutely no chance."—online discussion participant*

Some recognised that there are things they might not know to ask, such as whether planning permission would be needed, whether a roof can be accessed if it has solar panels on it, or whether there are different options for listed homes. Furthermore, considering previous renovation work prompted homeowners to think about disruption, potential for problems, or what to do if things went wrong. Suggestions of 'things you might want to consider'—or having someone whose experience and knowledge would mean they would know to consider these 'unknown unknown' things on your behalf—was felt to be very valuable to prevent unforeseen issues and costs.

The customer journey

A customer journey was developed to summarise homeowners' experiences of searching for information, advice, and guidance about energy efficiency measures and low-carbon heating, including what they did and why, their feelings at different stages and, where relevant, the impact on their behaviour. Please see Annex 1 for a map of this customer journey.

Searches typically started online, where information found seemed to act as a stepping stone. Online searches gave some indication of energy efficiency measures and low-carbon technology that homeowners might then choose to explore, though this was via generic and largely objective information with little that they felt was relevant to them. The lack of relevant advice and guidance highlighted to homeowners the need to get bespoke advice. They expected that following an initial online search they would seek out more tailored advice, which they wanted to be based on a detailed home survey carried out during a visit to their home.

Illustrating the customer journey with case studies

Follow-up interviews were conducted with six participants from the online discussions. Case studies have been developed to illustrate these individuals, their situations and motivations, and their experiences in looking for information, advice, and guidance. In this section, examples are drawn from the case studies to illustrate key points on the customer journey. Please note that names have been changed. Case studies can be found in Annex 2.

1. Trigger

Katherine was already familiar with Energy Performance Certificate (EPC) ratings, having previously made changes to her family's home to cut their energy bills. She felt that she would consider energy efficiency measures and low-carbon technology and try to improve her EPC rating if she was already making other, wider changes to her home.

2. Broad search

Mark felt most motivated when he first started looking for information, advice, and guidance. He expected the search process to be simple and straightforward. However, he struggled to find information relevant to his property type. He was not particularly motivated to look for further information as he did not feel this was an area he could navigate himself; he would rely on a specialist to take full control.

3. Visited trusted sites

Joan was expecting to find a government website that would provide all the information she would need but was disappointed that she could not find such a site. Instead, she visited the Which? website. She is familiar with Which? - she pays for a subscription and has used it throughout her life, even recalling her parents referring to the Which? magazine when they made purchases. She was hoping to find some customer reviews on the website but was disappointed by the lack of detailed information. She next turned to Money Saving Expert, where she found reviews from like-minded people she felt she could trust.

4. Weighing up benefits and costs

Katherine looked at ways of reducing her home's EPC rating but felt the information was generic and lacked detail about the costs and benefits of making changes. Being unable to weigh up costs and benefits, Katherine instead searched for EPC surveyors, speculating that they might be able to provide her more detailed information about the costs and benefits of different energy efficiency measures and low-carbon technologies.

5. Search for tradespeople

Isla felt that a ground source heat pump might be suitable for her home. After looking for information on the likely costs and disruption of installing a heat pump, she looked on local Facebook groups to see if anyone in her local area mentioned having installed a heat pump—she wanted to find out which contractor they had used and how the installation process had been.

6. Search for financing

During the search process, Jessie came across Greenmatch.com and was surprised to discover a grant that she might be eligible for, so she continued to look for information about what she could install.

7. Search for similar examples

Jessie looked at online blogs written by people who have similar properties to her, as she wanted to understand and manage her expectations of what further changes might be possible in her Victorian home, the front of which is protected so cannot be altered. She was

also interested in any unintended consequences—positive or negative—that might come with installing energy efficiency measures or low-carbon technology. This attitude came from her home feeling unexpectedly ‘cosier’ after they had insulated the back of the house; she enjoyed the feeling of spending time in a warm, comfortable room and felt that this had had a positive impact on her life.

Homeowners want information that is easy to understand and use

Homeowners wanted clear, easy-to-understand information—some of the information they had found during their search was quite technical. Some participants in the online discussions suggested they would want to be able to easily compare different measures and technologies and their respective benefits (such as return on investment and lifespan). A couple of homeowners found that they “*got stuck in a loop”* finding suggestions for things they had already installed. Options that allow people to highlight the measures and technology they are interested in and filter out those that they are not interested in could help people make relevant and meaningful comparisons between different options.

Expert interviews further supported both these points. They emphasised the importance of a useful format—something that could help people compare options and products—but pointed out that this would only be useful if people understood the energy efficiency measures and low-carbon technology and their options.

Homeowners want bespoke advice

Having found large amounts of generic information online through a relatively undefined search (i.e. no key questions to answer, no particular information in mind), homeowners felt that they would need bespoke advice in order to make progress. They expected this advice would be given based on a detailed home survey.

In reflecting on who they would want—and trust—advice from, homeowners generally wanted to defer to someone with more knowledge than themselves but would prefer to do this within as close a relationship as possible which would enable them to trust the information given.
They would like to consult friends, family, or other acquaintances like neighbours, but most do not know someone who has installed energy efficiency measures and low-carbon technology, particularly low-carbon heating. Homeowners typically felt that their usual tradesperson (*“my plumber”*) or a tradesperson recommended by a friend or family member (which was the common approach to finding a tradesperson) would probably not be familiar with these new measures and technology nor trained to install them. That said, a few mentioned having taken energy efficiency-related advice from builders and plumbers, typically as a larger piece of work (e.g. a renovation). One participant mentioned that the advice she had been given to flush radiators to improve their efficiency was something she had never heard before, which made her wonder whether all useful information was readily available online. Therefore, most felt that they would like to consult an independent, impartial expert who can advise on the

relevant topics: choosing suitable measures and technology, factors that should be considered, finance options and so on.

Importantly, homeowners would value getting this bespoke advice in-person. This was primarily driven by a belief that for advice to be tailored to one's home, the person giving that advice would need to visit the home and conduct a detailed home survey. It is also worth highlighting that homeowners wanted advice to reflect their household's needs, lifestyle, and circumstances as well, including their budget and the reason for wanting to undertake the work—and how they could maximise the impact within their budget.

> *"If I'm on a budget, I could see what I need to spend in order for the maximum increase [in energy efficiency performance]"—online discussion participant*

A detailed home survey could also provide an opportunity for a customer to discuss these factors and for the expert to see people's homes and get an initial feel for a household and their lifestyle.

Seeing and experiencing technology for themselves

Other instances where homeowners felt it would be valuable to get information and advice in- person is with seeing and experiencing energy efficiency measures and low-carbon technology and their outcomes. They felt that they would like to see and experience the measures and technology in a realistic setting, ideally a home similar to theirs and occupied by a similar household. This would help give them confidence that such changes to their home could be successful, reassuring them that the measures and technology would be suitable for homes and households like theirs. One suggested that homes installing energy efficiency measures and low-carbon technology could be offered a subsidy to act as a 'show home', allowing others to come and experience the measures and technology in a realistic, relevant setting and talking prospective buyers through their own experiences. Another who had made substantial changes to his home was already involved in the Green Open Homes initiative offered by the Centre for Sustainable Energy. When he described this initiative, other group members responded positively to this concept and said they would be open to travelling to visit other homes (though would prefer to do this locally rather than travel further across the country).

That said, homeowners did not mention finding initiatives like this as part of their search for information, advice, and guidance—there is an opportunity to highlight these schemes. Expert interview respondents highlighted that there were community/organisation newsletters and events, and outreach and engagement activities, but these were not something homeowners mentioned they found during the pre-discussion task.

The importance of getting advice in-person (detailed home survey)

Participants in the online discussions found sites offering tailored information, such as SEA. Some found these through their own searches while others visited them based on signposting in the pre-discussion task. Regardless of what led them to these websites, participants tended to feel that the process of inputting details about their home to get tailored information was not a suitable substitute for a home survey. A few felt that tailored information was only as good as the inputs on which it was based, and felt that they may not

be able to provide these inputs accurately. On the other hand, it was assumed that someone with the expertise to deliver bespoke advice would know exactly what they were looking for and would be able to assess more accurately and pick up on things that a homeowner might miss. Some compared the expected level of detail to EPCs, making it clear that they would expect such a survey to be far more detailed than an EPC. They expected that an expert carrying out a detailed home survey would have a greater degree of expertise than an EPC assessor, with the latter perceived as someone who has been trained for the specific purpose of conducting EPC assessments and who may not have extensive expertise beyond this. They also expected a detailed home survey to be more thorough than an EPC, which some felt was a relatively quick process, and that it would include discussion of the homeowners' needs and situation as well as the property itself. This was agreed across those who had positive and negative perceptions of the value of EPCs.

Homeowners wanted bespoke home surveys to be carried out by someone trained and experienced in this specific topic, who would be able to offer advice not just on suitable energy efficiency measures and low-carbon technology and what a holistic package might involve, but also on how to find installers, available finance, the scale and disruption of the work, and how to use the new measures and technology once installed.

> *"I'm a vet, so if someone comes to me with an animal problem, I can solve it. I would like to think if I go to them with an issue that I want to reduce my carbon footprint, in their profession they can solve that."- online discussion participant*

Homeowners expected such an individual to have up-to-date knowledge of these areas and, importantly, to be able to draw on experience as well. Having someone who knows what you don't know because they have been through processes on similar retrofit projects before was seen as very valuable.

> *"If you have someone who is experienced, and that this is their craft, they're not going to miss those kinds of things. They're going to know everything that has to be in place […] make sure you're aware of all the costs and the outlay and to ensure that there isn't anything unforeseen."—online discussion participant*

A participant in one of the online discussions was aware of a charity that supports 'energy assessors' and reflected that this was similar to the role other participants in the discussion were describing that they would like. Others were positive about this idea.

Some suggested that other people who could offer this kind of advice might include mortgage brokers and estate agents, with this information particularly useful to those who would consider selling a house after installing energy efficiency measures and low-carbon technology. They wanted to understand the impact on the home value and ease of sale. The latter was not just expected to be that it would make it harder to sell the home—one participant felt that perhaps it would be easier to sell a home with low-carbon technologies fitted as he understood that landlords already have to ensure their properties meet a minimum EPC level and may be keen to buy a property where work had already been done to meet these requirements. Some of the interviewed experts also suggested that real estate

surveyors and valuers could play a role in providing information, advice, and guidance.

Information, advice, and guidance changes constantly

Expert interviews highlighted that the information, advice, and guidance people would need to retrofit their homes was constantly changing. Some homeowners also pointed out that the pace of change in technology was rapid and they expected that energy efficiency measures and low-carbon technology could quickly become outdated. Similarly, they reflected that changes in government-funded incentives were frequent and feared that they might rely on support that may then not be available, or maintained, once they had installed new measures and technology. They expected that experts providing advice would also be knowledgeable about how technology and funding would change in the near future and would provide advice that incorporated this.

How homeowners expected they would use bespoke advice

Typically, homeowners wanted an expert to be able to offer one holistic package, rather than suggesting different options. Similarly, experts reflected on the need for a whole-home, integrated approach. One homeowner felt that a single recommended route was preferred because it was felt that there are *"so many options"* that having one recommended route would make things simpler and more convenient than having to understand and weigh up the relative advantages and disadvantages of different options.

> *"I think that's exactly what the problem is […] if someone might install one thing and they think it's going to make a difference, but they don't understand the implications of all the other elements of what is missing in their property […] then they haven't got the money in the budget to fix the other areas where they've got huge gaps in the insulation and all the heat is leaking out."—online discussion participant*

Some demonstrated an understanding of 'fabric first'—explained as making 'basic' changes like installing insulation first—and recognised that this could prepare their home for installing low-carbon heating further down the line, so a phased approach to installing the whole package could be attractive too. Expert interviews also reflected this, suggesting that the focus should be on getting homes 'net zero ready' i.e. preparing them for low-carbon heating, rather than making them 'net zero now'. Some participants in the online discussions seemed positive about the idea of such an expert acting as a project manager, who could identify installers and plan and oversee the installation process.

> *"There needs to be like a registered database of energy assessors who can come and act like a project manager."—online discussion participant*

A few participants in the online discussions said that they would use the information as a basis for doing their own research—this tended to be because they wanted to make sure they were spending (large amounts of) money on the right thing and that they would be reassured by doing their own research and feeling that they had a reasonable understanding of what was involved. One felt that if the advice could also include an estimation of costs, that could give some people confidence to pursue the project on their own without the worry that they might

be ‘ripped off’.

> *“They can assess everything so you know what you need to get done, what’s reasonable and not excessive. Then you can go off and do it with that plan.”—online discussion participant*

Regardless of whether they would want to explore recommended options themselves or allow an expert to manage the process for them, homeowners agreed that a bespoke recommendation would encourage them to seriously consider and perhaps progress to installing energy efficiency measures and low-carbon technology.

A detailed, bespoke plan for installing energy efficiency measures and low-carbon technology could give homeowners confidence to make changes to their home

Homeowners felt that if an expert could come out to assess their home and provide a detailed, bespoke plan of what was needed, they would feel more confident about installing energy efficiency measures and low-carbon technology.

The information and advice that homeowners wanted, especially when making higher-value purchases, is not all covered by existing tools like SEA or EPCs. EPCs do not highlight non- financial benefits, which are key to helping people understand the proposition and assessing whether energy efficiency measures and low-carbon technology could give them something they would value. In terms of highlighting non-financial benefits, a detailed retrofit plan could help by making recommendations on the basis of the household, lifestyle, and circumstances (as well as the home itself), noting that the importance of different benefits would depend on the household and their motivations.

Some homeowners would pay for a bespoke plan, while others felt advice should be free

Opinions about whether such a plan would be worth paying for were varied. Some homeowners said they would pay for a detailed plan, on the basis that it would give them confidence that the measures and technologies recommended (and subsequently installed) would be suitable for their home. A couple highlighted this would be particularly useful given the large sums of money they might be investing and what it might cost to rectify if unsuitable measures and technologies were installed.

> *“People have paid out for these things, and then it costs them £40,000 instead of £20k because they had to bring someone else in, scrap the system and go with something different.”—online discussion participant*

A couple also spontaneously mentioned that they would expect such a plan to cost around £200 or £300. There was also a suggestion that those who went ahead with installations might be eligible for a rebate on this cost. Others said they might pay for a plan but would consider how valuable this would be. The reasons that would encourage them to pay were

similar to those of the homeowners who said they would definitely pay an upfront cost to be given confidence that the money they might invest was being well-spent. What differentiated the homeowners who might pay from those who definitely would was that those who might would want to know if paid advice from an 'accredited' expert would be superior to advice they could get for free.

> *"I'd maybe pay to get a more in-depth rather than just kind of overview […] EPCs aren't accurate, you can do a better survey."—online discussion participant*

Some homeowners felt strongly that they would not be prepared to pay for advice. These individuals tended to feel that if the government expected them to make changes to their home to reduce carbon emissions (and hit government targets) then the government should provide the advice for free. Some also noted that it would be unfair to ask people to pay for the advice given as some would not be able to afford it.

Problems during the installation process

Although homeowners did not tend to spontaneously consider what they might do if things went wrong, expert interviews highlighted that people often look for information, advice, and guidance when they have a problem or issue. Experts also flagged that there are limited protections in place for consumers investing in energy efficiency measures and low-carbon technology, which could deter those who are seriously considering installing these.

Some homeowners felt that an expert providing bespoke advice should be able to recommend suitable installers and foresee potential issues during the installation process and suggest contingency plans. Such experts would be expected to draw not just on professional training but on their experience working with similar homes and households, so that details a homeowner might miss would be proactively accounted for.

Dissatisfaction with the outcomes

In considering low-carbon heating systems in particular, most did not compare the expected level of warmth and comfort a new system could deliver with what they experience from their current heating system. Once prompted, homeowners wanted assurances that they would be able to get comfortable with a different kind of heating system. As well as recommendations of technology suited to their home, they wanted to know that if they were not happy with the outcome their issues would be rectified quickly and that the cost of this would be covered so that they were not left out of pocket.

After being prompted to consider how they would like issues to be resolved, some highlighted that before they seriously considered the work they would want to know that assurances were in place.

Industry standards, whereby installers and engineers are required to have certain certification and work to specific standards, were also suggested as a solution, as homeowners expected responsibility for resolving the issue would lie with the registering body—they cited CORGI (Council for Registered Gas Installers; since replaced by the Gas Safe Register) as an example. Others suggested that if they had found an installer via another list of 'registered' installers, they would want that register to be backed by a body able to resolve issues. Such a body might be important particularly while there are relatively few installers in this area. One participant pointed out that finding someone who can install and maintain low-carbon technology in particular, might be hard and that finding an alternative installer to rectify any issues could be difficult.

Homeowners wanted a single platform for trusted information, advice and guidance

Homeowners highlighted they wanted one go-to place for information, advice, and guidance. The government was not necessarily seen as the source on information, but as a body that could compile it in one central, accessible, easy-to-understand platform. Homeowners wanted that source to be impartial, so many suggest that the government should support it. Others reflected that it would not necessarily need to be the government that supported it, as long as whoever supported it was 'impartial'. In exploring what was meant by 'impartial', homeowners explained they wanted information from someone they could trust in terms of capability and motive. They do not trust those they think are trying to sell them something (potentially unsuitable) to make a profit. Manufacturers, installers and energy suppliers would not be trusted to provide this information—at least, not independently. Charities, non-profits and/or organisations jointly supported by industry (where homeowners feel the expertise lies) and the government (where they think the motive lies) were suggested as bodies that could support a central platform.

> *"It could be a non-profit or charity with no agenda to sell you anything."—online discussion participant*

Aside from whether it's important for government to provide information, a few felt that if government would require homeowners to make changes to their home to help reduce carbon emissions, then the government should therefore support homeowners in that process. They felt this should be both through providing information and advice and through financial support.

It is important at this stage to emphasise that while homeowners said they wanted a single place they could go to for information, advice, and guidance, they by no means felt that the whole journey from researching energy efficiency measures and low-carbon technology through to installation could be managed on their own or via a remote platform. With most doing their preliminary research online, an online hub could help provide balanced, easy-to-

understand information. However, homeowners reached a point where they felt they could no longer progress without bespoke advice. An online platform could help connect people with suitable experts who could provide bespoke advice: homeowners in this research were clear that they would expect to receive bespoke advice from a person visiting their home—there was no substitute for this.

Homeowners' proposed solutions

Encourage homeowners to consider energy efficiency measures and low-carbon technology at relevant touchpoints

Homeowners felt they would consider these changes to their home as part of larger home renovations projects, which are often approached with enthusiasm, acceptance of disruption and available finance. Targeting information, advice, and guidance to those considering renovation work and via sources they may consult as part of that could help incorporate decarbonising steps into home renovation work. Offering different options could help people consider the scale of changes that they could make within their plans and budget as well as encouraging them to consider changes they could make further into the future. For example, initial changes during renovation work could prepare a home for low-carbon heating to be installed at a later date.

Make it easier for homeowners to find information

Improve the provision of clear, relevant information about energy efficiency measures and low-carbon technology

Homeowners felt overwhelmed by the volume of information they found. On trying to navigate it, some found it technical, others found it conflicting, but all found it largely irrelevant and struggled to understand how energy efficiency measures and low-carbon technology— particularly low-carbon heating—would benefit them.

While some may realise the variety of options available when they start searching online, those who are digitally excluded may be more likely to narrow their search to familiar measures and technology early on and follow the recommendations from those they know who have installed these. Without advice or guidance that leads them to consider other options, this could lead to them considering—perhaps even installing—measures and technology which are not suitable for them.

Homeowners wanted information and advice tailored to their homes, which is difficult to provide online without asking lots of technical questions, many of which people will struggle to answer accurately. However, it may not be impossible if there is sufficient incentive for the market to innovate. For example, a US company called Sealed have developed an online process for doing just this.

Homeowners felt that bespoke advice should be based on a detailed home survey carried out by someone with fine knowledge of the measures and technology and financing options and an awareness of how these might change in the near future. They would also want this expert to have experience of working with homes and households similar to theirs. They expected the survey to be conducted in-person, feeling that an expert in this area would be able to identify details about their home that they themselves might not know. Furthermore,

an in-person meeting could help to build rapport and trust which might support the advice and facilitate an ongoing relationship with someone who could act as a single point of contact for a household.

Helping people find clear, relevant information could help them to set out on the journey of considering energy efficiency measures and low-carbon technology.

Support people throughout their journey

While homeowners felt an online platform could not, alone, support homeowners through the process of identifying and installing suitable energy efficiency measures and low-carbon technology, it may be a powerful first step to set them on their journey as well as a resource that they return to. Such a resource could encourage people to initially consider energy efficiency measures and low-carbon technology by:

- Highlighting the benefits that energy efficiency measures and low-carbon technology could offer homeowners, such as warmth and comfort, reliability, improved home value.
- Offering tailored information rather than generic information which might recommend measures and technology they already have—the latter may promote a false sense that people have already taken sufficient steps to decarbonise their homes.

As well as offering descriptive information about different energy efficiency measures and low-carbon technology, for example explaining what a heat pump is, a website could provide advice and guidance on what should be done when installing these. This could help homeowners acknowledge the complexity and risk involved which, balanced with emphasis on the relevant benefits and signposting of ways to access bespoke advice, could encourage people to consult an expert to ensure they get a positive outcome.

Informing homeowners that there may be certain things to consider—and perhaps tailoring this to individual homes (e.g. whether a home is a listed building or has limited outside space)— may help people recognise that expert advice will help them get a successful outcome from a process that might be too complicated to navigate on their own.

As well as encouraging people to consider energy efficiency measures and low-carbon technology and consult an expert to get bespoke advice, an online platform could act as a resource for people to return to throughout the installation process. For example, it could provide case studies of successful installations in a variety of different home types and use cases. Individuals could filter these case studies based on measures and technology they have been recommended and factors relevant to their own situation (e.g. the type of home they live in), to give them confidence that making the suggested changes would give them the outcomes they want. It could even highlight local ‘show homes’ that they could visit to see and experience energy efficiency measures and low-carbon technology in real-life settings.

Make it easy to understand and access financial support

Signposting and communicating financial support and eligibility criteria in simple, clear, high-visibility ways could encourage uptake among homeowners. As increasing numbers of people make use of financial support to install energy efficiency measures and low-carbon technology, word of mouth and social factors may trigger others to consider similar installations, especially if they hear of others' positive experiences.

That said, making it easier for the supply chain to help people access the right financial support may be more effective. Experts who are familiar with government advice and policies will be able to identify suitable financial support better than most homeowners who, left to navigate and negotiate the complexities themselves, may fail to work out what is available to them.

Some perceived the application process for financial support to be complicated and worried that they might make mistakes, potentially making a long process even longer. A simpler application process where people know upfront what information is required may encourage uptake. Alternatively, an expert advising a home on energy efficiency measures and low-carbon technology could manage this process for individuals.

Support homeowners in the event of issues with installation

Before installing low-carbon heating in particular, homeowners wanted to feel confident that the technology—and the way in which it would be installed (e.g. by a trained installer who is accountable for the quality of the installation)—would give them the outcomes they wanted. However, they also wanted assurance that in the event they were dissatisfied with the outcome, their issues would be quickly resolved at no extra cost to them.

Quick resolution of issues and overall satisfaction with the outcome could also promote positive word of mouth. Homeowners mentioned that they would ask others about their experiences of the installation process and outcomes, including whether there were any issues and how these were managed. Positive word of mouth could give those who adopt this technology later confidence in the outcome. It would also drive-up quality in the supply chain.

Appendix 1: online discussion participant brief for pre-discussion task

Pre-work task

Before the focus group, we would like you to complete a pre-work task and share some information with us via WhatsApp.

Firstly, we would like you to imagine the following scenario.

[INSERT SCENARIO FROM BELOW]

Group 1: Imagine you have some money to spend on energy efficiency measures and low-carbon heating to make your home 'carbon neutral'.

A 'carbon neutral' or 'zero carbon' home generates enough of its own renewable energy to run and heat the home entirely.

Group 2: Imagine you have some money to spend on a substantial home renovation project (e.g. renovating a kitchen or bathroom, or building an extension). As part of that project, you need to include energy efficiency measures and low-carbon heating.

Group 3: Imagine you have some money to spend on energy efficiency measures and low-carbon heating to increase the Energy Performance Certificate (EPC) rating of your current home to band A.

An EPC contains information about a property's energy use an typical energy costs, and recommendations about how to reduce energy use and save money. You can find your home's Energy Performance Certificate here. If you cannot find your home's EPC, please get in touch with us.

Instructions

Please spend about an hour looking for the sort of information, advice and guidance that you would want in this scenario, to help you understand and make informed decisions about the options available to you.

You may want to think about costs, what is involved in installing these measures and finding appropriate tradespeople, but there may be many other factors that you want to think about too.

You might like to consider the following sources, but these are just a suggestion and we'd encourage you to think about where else you might look for information, advice and guidance.

- Search engines
- Specific websites:
    - Simple Energy Advice
    - Centre for Sustainable Energy
    - Energy Saving Trust
    - TrustMark
- Social media
- Tradespeople e.g. plumber
- Energy companies
- Printed media e.g. newspapers and magazines

During the focus group, we'll ask you about your experiences during this task, so please come ready to talk about what you did and how you found it.

We'd also like you to take some pictures or screenshots, some short notes or even record some video or voice notes to let us know how you get on. This doesn't need to be extensive – just enough to give us a flavour of your experiences and anything you found particularly interesting.

Before the focus group, we'd like you to use WhatsApp to send us a few examples of what you've found, for example photos, screenshots or links for anything you've seen online, photos of printed material, or even written notes, audio notes or video to let us know about anything else you've found. [Gabi to add details]

Secondly, please find at least one example of someone's experiences of installing a low-carbon heating system, for example a heat pump. This could be an article, a blog or forum post online, a video (e.g. on YouTube) or even a conversation you have with a friend or family member who has installed this technology.

It doesn't need to be too long or detailed, but should be enough to give you an idea of what's involved in their experience of researching, choosing, installing and operating a new heating system.

Please consider, and be prepared to discuss:

What you've learned from their experiences

Whether it would change how you would look for information, advice and guidance

Again, please drop us a quick message on WhatsApp to let us know what you've found e.g. a photo of or link to an article, a written or audio note or video summarising a conversation etc.

Appendix 2: digitally excluded participant brief for pre-discussion task

Pre-work task

We would like you to imagine this scenario:

Imagine you have some money to spend on energy efficiency measures and/or low-carbon heating to help make your home ‘carbon neutral’.

‘Energy efficiency measures’ includes things like double glazing or insulation, which make your home more efficient to heat.

‘Low-carbon heating’ refers to heating systems you might have instead of a gas boiler, for example heat pumps.

A ‘carbon neutral’ or ‘zero carbon’ home makes enough of its own renewable energy to run and heat the home entirely, so it doesn’t use gas or electricity from the grid.

Instructions

Please spend about an hour looking for the sort of information, advice and guidance that you would want in this scenario. Think about what would help you understand the options available to you and what would help you make informed decisions about those options.

You may want to think about costs, what is involved in installing these measures and finding appropriate tradespeople, but there may be many other things that you want to think about too.

You might like to consider the following sources, but these are just a suggestion and we’d encourage you to think about where else you might look for information, advice and guidance.

- Tradespeople e.g. plumber
- Energy companies
- Printed media e.g. newspapers and magazines

During the interview, we’ll ask you about your experiences during this task. Please come ready to talk about what you did and how you found it.

If you have any questions about this pre-work task, please contact XXX on 07XXX XXXXXX.

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