Insights into consumer attitudes to decarbonisation and future energy solutions

An update from Ofgem’s annual Consumer Survey

May 2021

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Introduction

Introduction

In 2020 Ofgem published its Decarbonisation Action Plan.[1] This set out the steps we would take in 2020 and 2021 to help to enable the most effective decarbonisation of the energy sector at the lowest cost to consumers. Our 2021/22 Forward Work Programme[2] reaffirms our commitment to helping to ensure Great Britain achieves net zero carbon emissions by 2050.

Last year we published a number of qualitative research projects exploring consumer attitudes towards decarbonisation[3]. That research highlighted that while most consumers are concerned about climate change and want to do their bit to protect the environment, many are unsure what actions they could take to reduce the impacts of climate change or decarbonise the economy.

Ofgem has undertaken a nationally representative survey of domestic energy consumers in Great Britain to measure consumer engagement with energy and their attitudes towards topical energy issues since 2014[4]. In 2020 we introduced questions measuring the extent of attitudes held towards decarbonisation and how many consumers are open to changing their energy use behaviour. This report is a summary of the findings relating to decarbonisation.

[1] Ofgem's Decarbonisation Action Plan | Ofgem
[2] Forward work programme 2021/22 | Ofgem
[3] Consumer Opinion about Climate Change and Decarbonisation | Ofgem
4 The annual consumer engagement survey. Previous reports can be downloaded from our website here: Research surveys with household consumers | Ofgem

How this report is structured

Achieving net zero greenhouse gas emissions by 2050 will require wide-scale behaviour change in multiple areas including transportation, heating and when energy is used (using energy flexibly). Smart meters will be a key enabler to support the adoption of low carbon products and services. This report has been divided into chapters covering these different issues, including:

- Consumer understanding and engagement with decarbonisation
- Transportation: Focus on electric vehicle users
- Home heating and insulation
- Smart meter adoption and flexible energy use

For a detailed break down of the 2020 survey results please refer to the data tables published alongside this report. For a full description of the 2020 survey methodology and objectives, please refer to the technical report.[1]

[1] Consumer Survey 2020 Technical Report

Summary of findings

Key messages: Consumer understanding and engagement with decarbonisation

BEIS's Public Attitudes Tracker indicates that the majority (80%) of consumers are concerned about climate change.[1] However, there is a mismatch between what consumers think they need to do to reduce the impacts of climate change and the actual behavioural changes needed.

Over half of consumers already think they're doing enough to tackle the impacts of climate change. The majority believe they're already doing all they can to save energy at home and nearly half say they have already made improvements to home energy efficiency.

There is some understanding of key terms used in public discussion about climate change such as 'net zero carbon emissions' or 'greenhouse gas emissions', but the term 'decarbonisation' isn't well understood, and therefore may be best avoided when communicating with consumers.

However, intentions to change home energy use or transportation habits are stronger among those who show greater involvement in energy e.g., those who have adopted electric vehicles (EVs) or solar panels.

1 BEIS Public Attitudes Tracker: Wave 37 - GOV.UK (www.gov.uk)

Key messages: Transportation – focus on Electric Vehicles

At this point in time, reported ownership of Electric vehicles (EVs) is low, but those who have adopted them are very highly engaged in the energy market. Most EV owners have switched or compared tariffs in the past 12 months, many report being on time of use tariffs and many have signed up to energy-deal switching services.

Most vehicle charging takes place at home and many EV users are open to the idea of smart charging.

Around a quarter of consumers without an EV believe they are likely to adopt one in the next five years. However, range anxiety (short battery life, concerns about being able to charge) and perceptions of high purchase price persist and remain the key barriers to adoption.

Key messages: Home heating and insulation

To achieve net zero targets home heating methods will need to change and many residences will also need to upgrade their insulation.

At this point in time most homes use gas central heating and awareness of alternatives such as heat pumps or hydrogen is relatively low. This is perhaps not surprising since initiatives to increase use of heat pumps are in their infancy and hydrogen heating is untested at scale.

Willingness to change how homes are heated is relatively low, with one in seven (14%) stating they intend to install low carbon heating such as heat pumps. However, younger consumers, those with higher incomes and those living in houses built since 1990 show greater inclination to do this. The main barriers to adopting low carbon heating are high perceived costs, scepticism that it will save money (by reducing energy bills) and perceived disruption to install.

Willingness to upgrade home insulation is a little higher compared to home heating, but few are open to installing home micro-generation. Once again it is younger and more affluent consumers who express greater willingness to adopt, while high perceived costs, doubts about any savings being made once installed and perceived hassle are barriers to adoption.

Key messages: Smart meter adoption and flexible energy use

Consumers shifting when they use energy (flexibility) will play an important part in the transition to net zero greenhouse gas emissions. Smart meters are a key enabler of flexible energy use. Installations continue to rise and the majority of consumers who don't have a smart meter are open to installing one.

Most consumers have an awareness of how much energy they use around the home and realise there are peak and off-peak demand times for energy. This knowledge may be helpful in encouraging take-up of products and services that encourage consumers to use energy at different times (when they become more widely available).

Around a third use appliances during peak times and most of these consumers acknowledge it could be easy to change when they use these appliances. However, it's likely they would need an impetus to actually make a change.

Strategies to encourage changing when appliances are used need to be compatible with people's lifestyles. The key barriers to changing when appliances are used are fitting around working or school patterns or difficulties in planning energy use.

Key messages: Smart meter adoption and flexible energy use

At this point in time, products and services that help consumers use energy flexibly e.g. smart appliances or smart heating (where the appliance is set to run at a low demand time) aren't widely accepted. Few are comfortable with the idea of an external company controlling when their appliances run.

However, EV owners appear more accepting of smart solutions, with two-thirds open to using smart charging. Claimed adoption of TOU tariffs is also higher among EV owners.

Conclusions and implications

This research highlights that some consumers are open to ideas or solutions that will help achieve net zero greenhouse gas emissions by 2050, with 24% consumers planning to buy an electric vehicle or plug-in hybrid in the next five years. However, there are substantial barriers to overcome before we see wide-scale changes to transportation, home heating or when energy is used.

Many think they're already doing what's necessary to combat climate change, highlighting the lack of knowledge about the extent of behaviour changes needed.

While intentions to change home heating or upgrade home insulation are relatively low, this may not be surprising since the infrastructure to support wide-scale use of alternatives to gas central heating isn't in place.

Communications and awareness raising will help consumers along the path to changing how they use energy, but this alone isn't sufficient to motivate behaviour change. It's important to be mindful that new heating, transportation and energy use solutions need to be affordable and compatible with consumer lifestyles or else they are unlikely to be adopted.

However there are signs of change. While EV ownership is low, it is growing and those consumers who have adopted them also show greater engagement in the energy market. This could mean they are open to other forms of behaviour change, but we need more insights to understand motivations here.

Conclusions and implications

This research is a starting point for understanding how to take consumers on the journey to achieving net zero. There are many challenges to encouraging behaviour change. Solutions to overcome these need to look at consumer motivations and lifestyles and understand how these affect behaviour.

Ofgem will continue its research with consumers, looking to understand more about underlying motivations for energy use or adopting low carbon technologies like EVs. We also look to the wider energy sector to help understand how to enable behaviour change and support the UK to achieve net zero greenhouse gas emissions by 2050.

Research method

Conventions used throughout the report

Significant differences are clearly marked throughout the report. All marked changes over time and subgroup differences have been tested at the 95% confidence level.
Changes between subgroups or changes over time are represented by black up/down arrows ↑↓ on the charts
Some figures have been rounded up / down, and not all categories are shown, so sums will not always total 100 per cent.

Abbreviations used throughout the report

Abbreviations used in this report:

- **ABC1 and C2DE** – These abbreviations refer to approximated socio-economic grades. The classification is based on employment status, occupation and whether the consumer responding to the survey works full or part-time. There are six grades: A, B, C1, C2, D and E. For analytical purposes, the grades have been grouped into categories.
- **BEIS** – The Department of Business, Energy and Industrial Strategy
- **EVs** – Electric Vehicles
- **GB** – Great Britain
- **LCT** – Low carbon technologies, e.g. electric vehicles or solar panels
- **PCW** – Price comparison website
- **SPV –** Solar photovoltaic panels
- **TOU tariffs** – Time of use tariffs

Research method

Target sample:

GB consumers with mains gas and/or electricity and full or shared responsibility for energy bills

Data collection: online, sampled from a blend of panels

Engagement with energy also measured through a telephone parallel run, using a representative quota sample of 1,635 consumers through the Ipsos CATI Omnibus.

4,608 online interviews in 2020

(2019: 4001; 2018: 4064; 2017: 4,001; 2016: 5,956; 2015: 5,934; 2014: 6,151)

Interviews carried out in all Government Office Regions in **England, and in Scotland and Wales**

Quotas on age, gender, social grade and working status, to reflect a **nationally representative sample of bill payers/partners**

Data weighted to align with profiles from previous years

Fieldwork carried out in June-September 2020

Median interview length = 25 minutes

Consumer understanding and engagement with decarbonisation

Key messages: Consumer understanding and engagement with decarbonisation

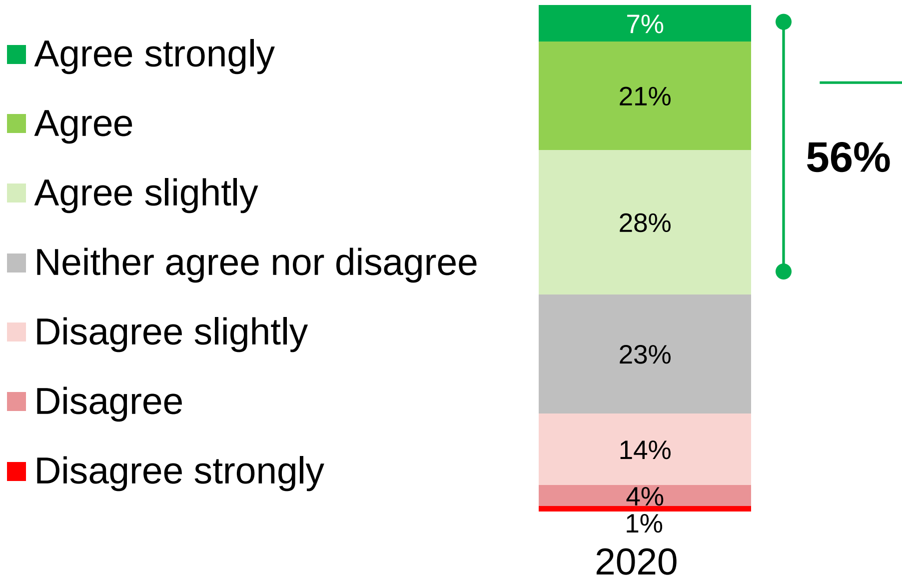
There is a mismatch between what consumers think they need to do to reduce the impacts of climate change and the actual behavioural changes needed.

Over half of consumers believe they're doing enough to tackle the impacts of climate change. Most believe they're already doing all they can to save energy at home and close to half say they have already made improvements to home energy efficiency.

Home heating/cooling is perceived to contribute less to greenhouse gas emissions than electricity generation from fossil fuels or vehicle exhaust emissions, while most consumers feel they only have a small to fair understanding of key terms used in public discussion about climate change. The term decarbonisation is not well understood.

However, intentions to change home energy use or transportation habits eg flying less are stronger among those who show greater involvement in energy e.g. those have adopted EVs or solar panels.

Over half of consumers feel they are already doing enough to tackle climate change



I think I'm doing enough myself to tackle the effects of climate change

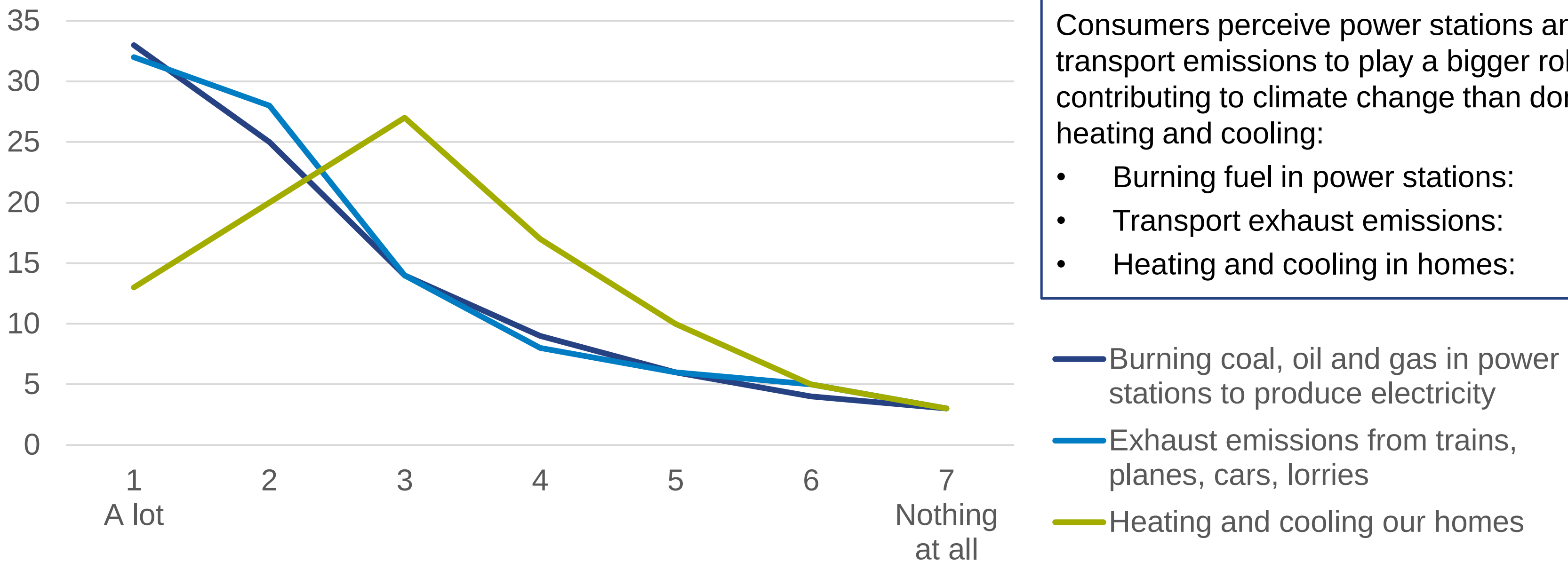
Adopters of low emissions technologies are the most likely to **agree** they're doing enough:

• EV owners:	83%
• Use auto-switching:	74%
• Hybrid vehicle owners:	68%
• Have solar panels:	68%
• Say they are on TOU tariff:	68%

ENG. Thinking about energy generally. To what extent do you agree or disagree with the following statements? Base: 2020 Total (4608)

Awareness of human contribution to climate change

While most think that human activities contribute to climate change, home heating/cooling is perceived to contribute less compared with other activities.



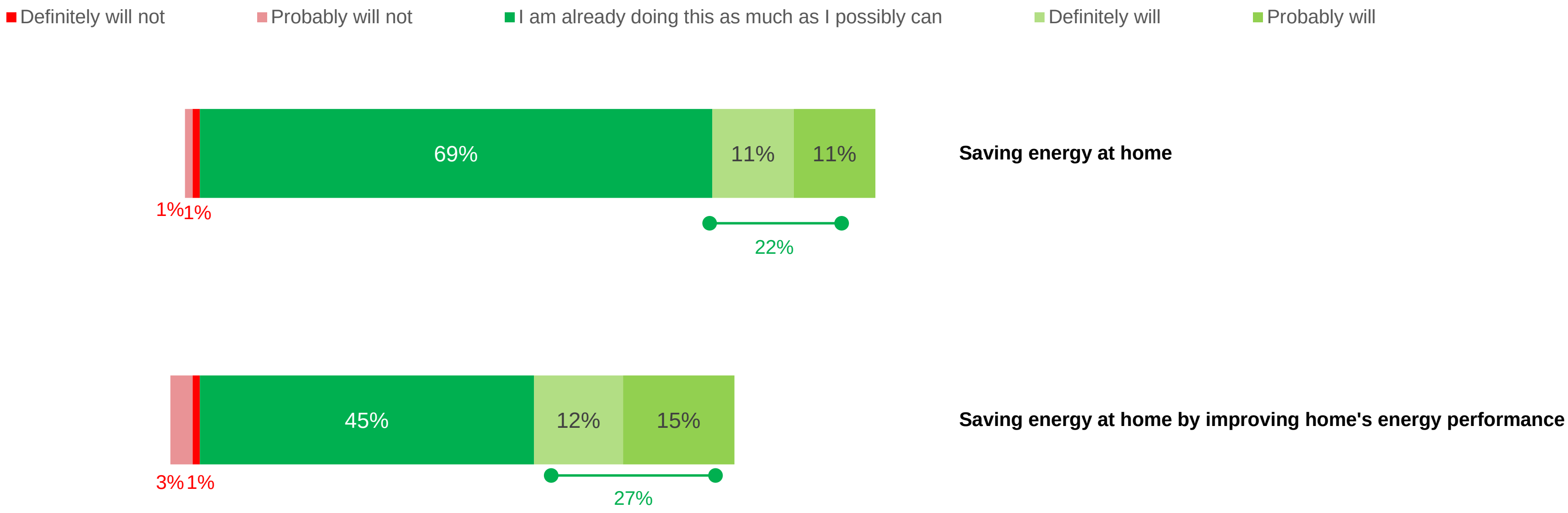
Consumers perceive power stations and transport emissions to play a bigger role in contributing to climate change than domestic heating and cooling:

- Burning fuel in power stations: 74%
- Transport exhaust emissions: 72%
- Heating and cooling in homes: 60%

Decarb2: How big a part, if any, do you think the following activities play in human contribution to climate change in the UK over the past few years? NB Lower numbers indicate higher level of contribution. Base: 2020 Total (4608)

Actions/intentions to limit contribution to climate change

Many consumers think they're already saving as much energy at home as they can, while almost half say they're already improving their home's energy performance.

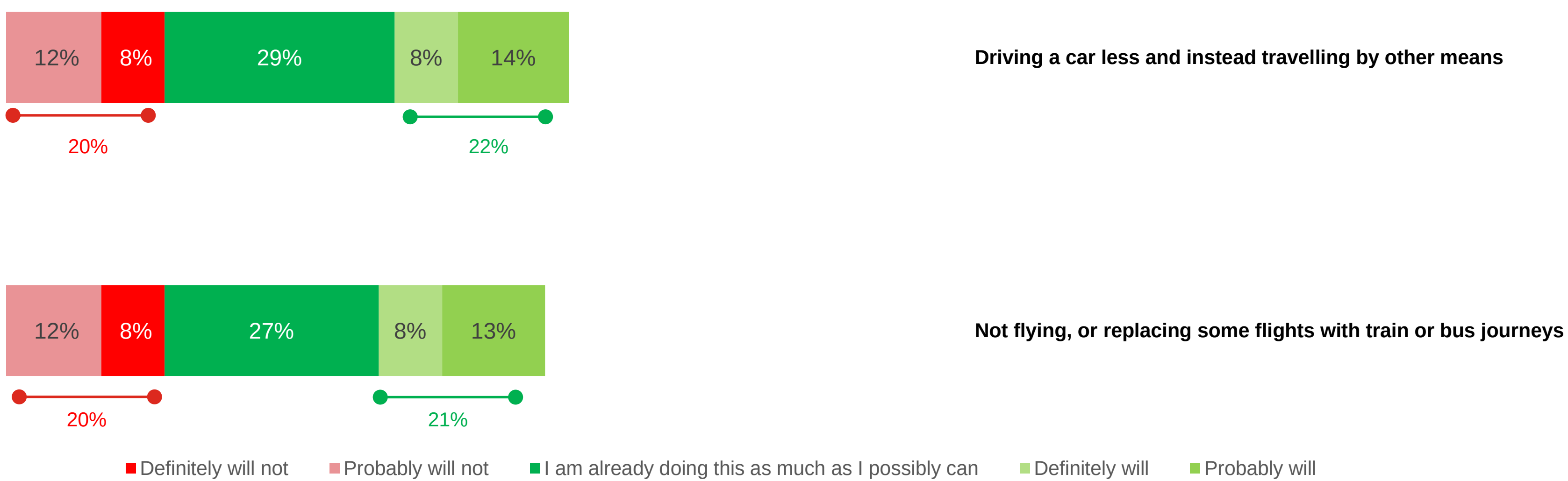


DECARB4. Thinking about things you and your household might do in order to limit your own contribution to climate change, how likely or unlikely would you be to make the following changes within the next few years? Where %s do not add up to 100%, participants indicated the statement was not applicable to them or answered don't know. Base: 2020 Total (4608)

Actions/intentions to limit contribution to climate change

Nearly three in ten consumers say they are driving a car less or replacing flights. Opinion is polarized among those who haven't taken this action; similar proportions intend to drive or fly less as do not.

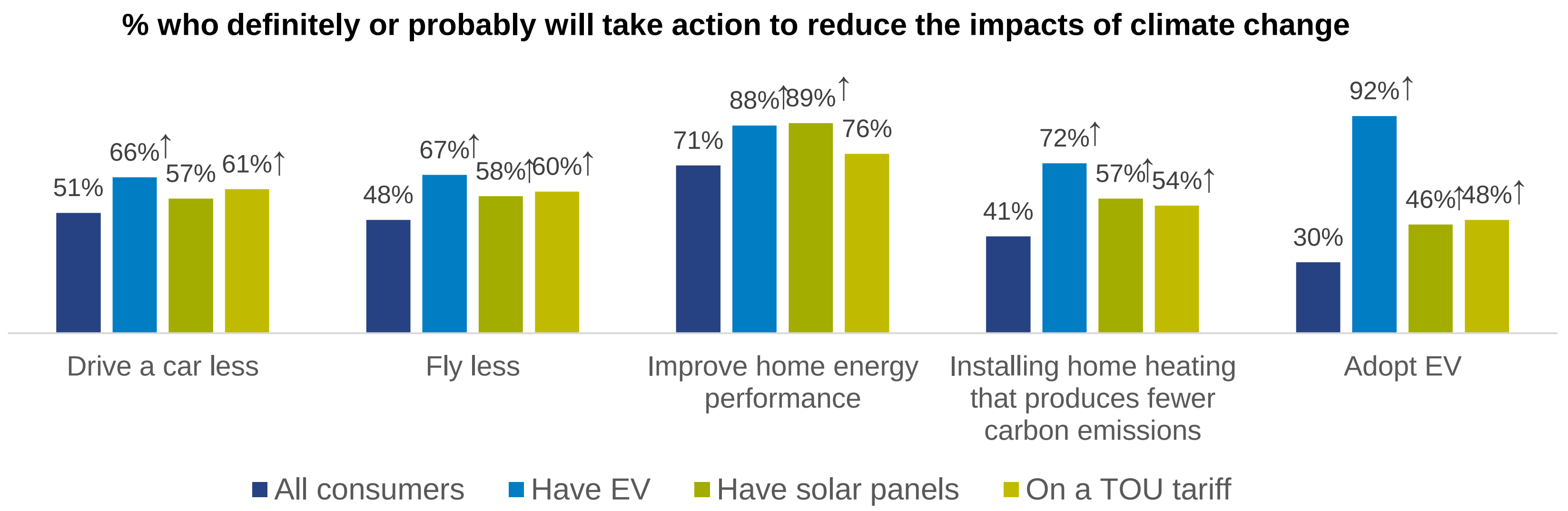
Intentions to adopt alternative transport



DECARB4. Thinking about things you and your household might do in order to limit your own contribution to climate change, how likely or unlikely would you be to make the following changes within the next few years? NB 1% or 2% value labels not shown Where %s do not add up to 100%, participants indicated the statement was not applicable to them or answered don't know. Base: 2020 Total (4608)

Intentions to take action are higher among EV owners

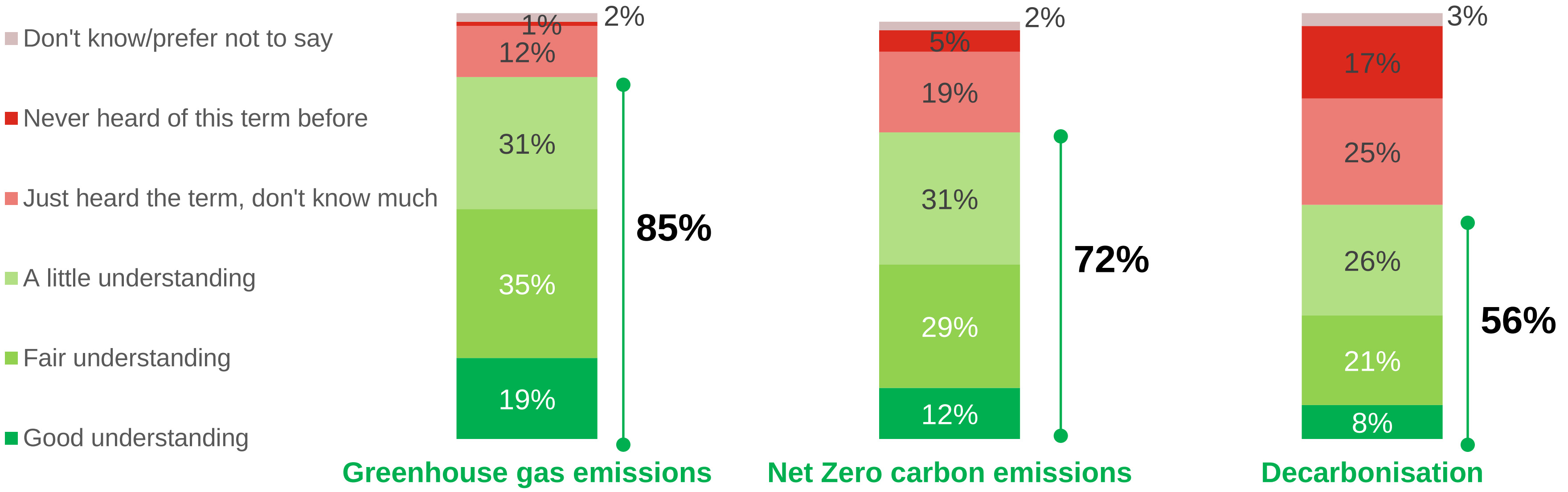
Consumers who own low carbon emissions technologies are more likely to claim they'll adopt behaviours that could reduce the impacts of climate change



DECARB4. Thinking about things you and your household might do in order to limit your own contribution to climate change, how likely or unlikely would you be to make the following changes within the next few years? Chart shows the % who are already doing the action or are willing to adopt it. Base: 2020 Total (4608), Have EV (147), Have solar panels (390), Say they are on a TOU Tariff (530), . ↑↓ indicate significant difference vs All Consumers

Understanding of terms relating to decarbonisation

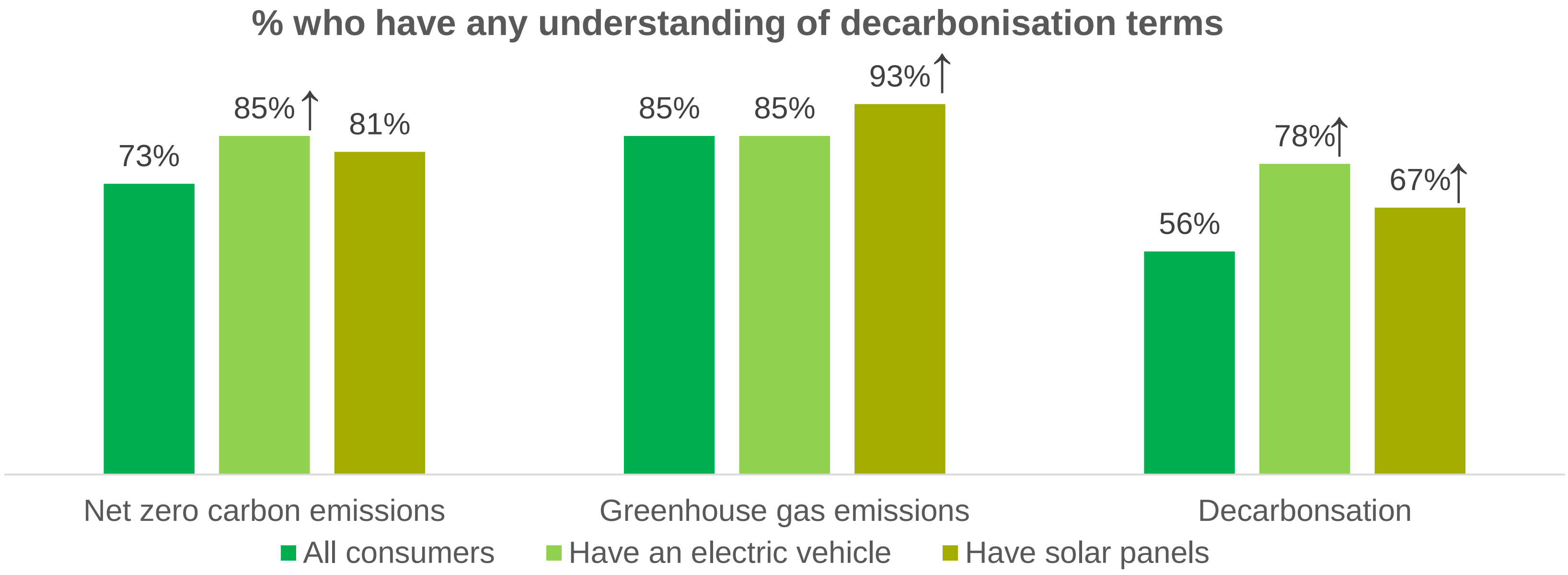
While most had heard of greenhouse gas emissions and net zero carbon emissions, few claimed a good understanding. Just over half had any understanding of the term 'decarbonisation'. Awareness and understanding of all terms was higher among ABs, higher income households and those engaged in the energy market.



Decarb1: How would you rate your understanding of what the following terms mean? Base: 2020 Total (4608)

More consumers who have adopted low carbon emitting technologies claim understanding of terms

Although we cannot infer causality between understanding of terms and adoption of technologies



Decarb1: How would you rate your understanding of what the following terms mean? Base: 2020 Total (4608), Have an EV (147), Have solar panels (390). ↑↓ indicate significant difference vs All Consumers

Awareness of new energy policies

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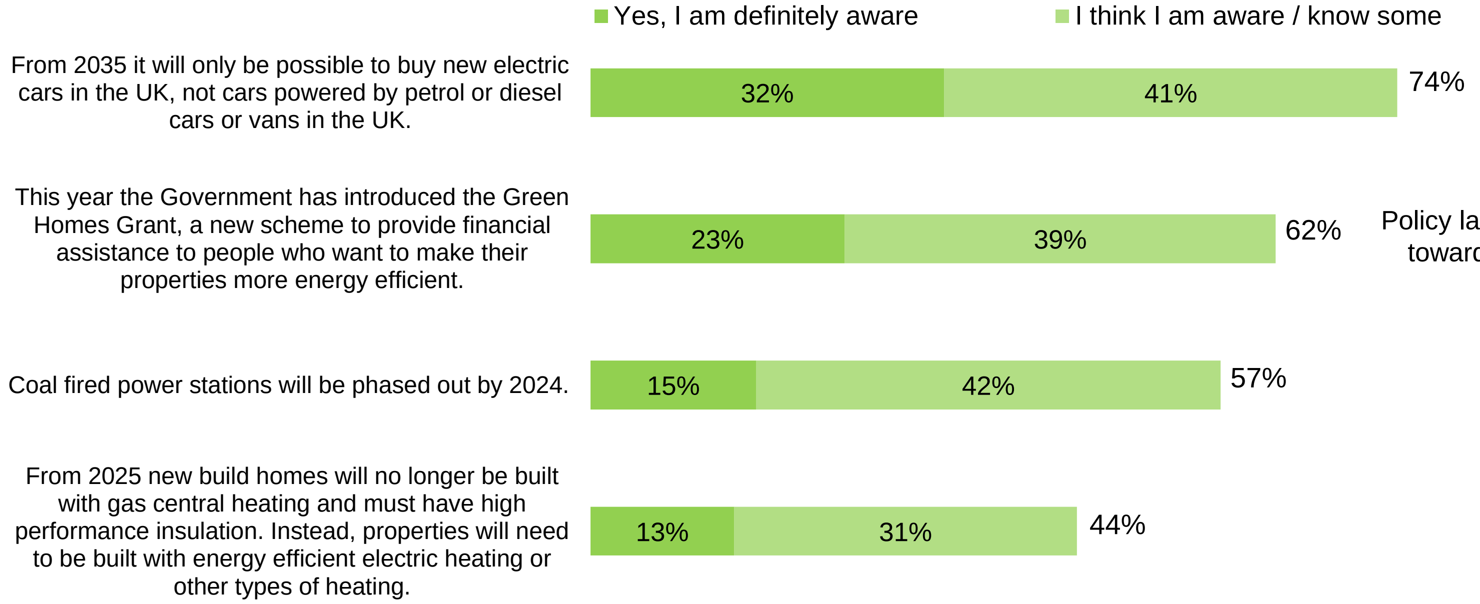
While most were aware of new policies related to electric vehicles, fewer knew about upcoming policies related to home heating and insulation. Older people, owner occupiers and people living in houses were more likely to be aware of all policies.



People with vehicles (esp EV owners) more likely to be aware

Policy launched on 30 September, towards end of fieldwork period*

QDECARB7. The Government has introduced some new energy policies. Which, if any, of these changes that are coming to the UK have you heard of before today? Base: 2020 Total (4608) * CAUTION: cognitive testing suggests that some may be answering about previous home insulation policies. NB: Policy has been moved forward to 2030 since the survey.

Transportation: Electric vehicle users

Key messages: Electric vehicles

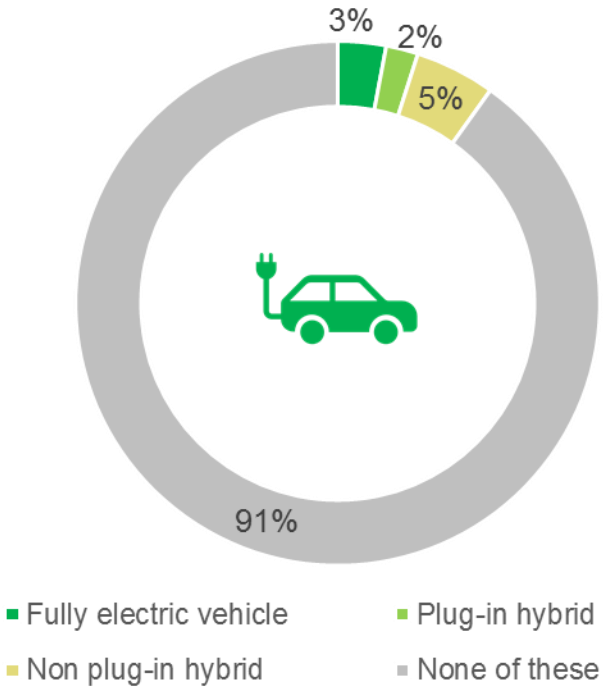
While ownership of EVs is low, it has been increasing gradually over time. EV owners tend to be younger on average compared with the GB population or from higher social grades (ABs). They're also very highly engaged in their energy choices; more say they use time of use tariffs and many have signed up to services that scan for cheaper energy deals for them.

Most vehicle charging takes place at home and two thirds of EV users are open to the idea of using smart charging for it.

Around a quarter of consumers say they intend to get an EV in the next 5 years. Perceived high up-front costs, range anxiety (fears about short battery life, concerns about being able to charge) remain the main barriers to adoption.

How many people, and who, have electric vehicles?

Electric and hybrid vehicle owners remain a minority. Owners are generally more engaged consumers.



Take up of fully electric vehicles is higher among:

- 16-34s (43%); AB social grades (56%); those with children (61%).

EV owners are more engaged in energy generally:

- They are more likely to say they are on time of use tariffs (**44%** among fully electric vehicle owners vs 12% among total sample).
- More likely to have switched (**71%** among fully electric vehicle owners vs 54% among total sample) and / or be signed up to energy scanning (**52%** among fully electric vehicle owners vs 20% among total sample) or switching services (**30%** among fully electric vehicle owners vs 5% among total sample).
- More likely to be concerned with their energy usage (**75%** among fully electric vehicle owners vs 60% among total sample).

QBCHECK. Can we check, does your household have any of these things? Base: 2020 Total (4608)

Demographic profile of EV users

EV users tend to be younger, from higher social grades and have children in the household.

	All GB	Have a fully electric vehicle
Age group		
16-34	16%	43% ↑
35-64	67%	44%
65+	17%	13%
Social grade		
AB	35%	56% ↑
C1	21%	12%
C2	16%	12%
DE	28%	20%

	All GB	Have a fully electric vehicle
Disability status		
Have a disability	28%	36% ↑
Don't have a disability	72%	64%
Number of children in household		
Children under 5	6%	18% ↑
Children aged 5-15	17%	43% ↑
No children in household	80%	46%

Sample base: All GB (4608), Have an EV (147). Arrows denote the proportion is significantly higher compared to the GB population

Engagement profile of EV users

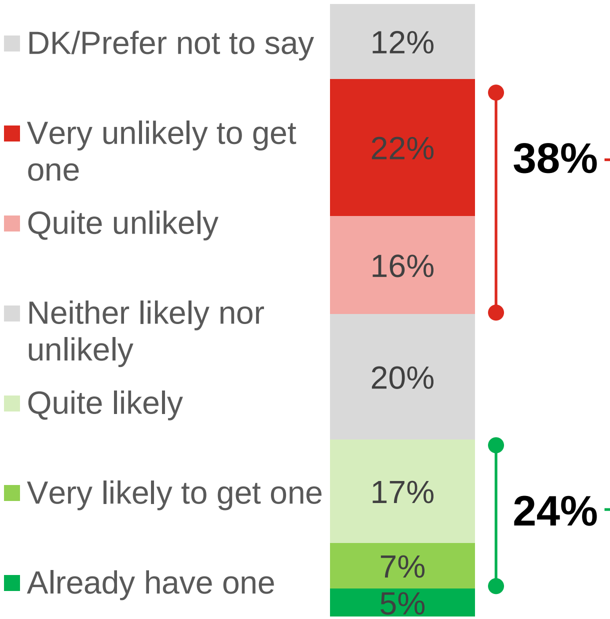
EV users are highly engaged with energy. Many use TOU tariffs and automated services to help them get the best energy deal.

	All GB	Have a fully electric vehicle
Are you on a TOU tariff?		
Say on a TOU tariff	12%	44%↑
Not on a TOU tariff	69%	40%
Energy engagement (compared or switched in past 12 months)		
Have engaged in P12M	65%	80%↑
Have not engaged in P12M	35%	20%
Use of energy scanning or auto-switching		
Signed up to energy–deal scanning service	20%	52%↑
Signed up to auto-switching service	5%	30%↑

Sample Base: All GB (4608), Have an EV (147). Arrows denote the proportion is significantly higher compared to the GB population

Intention to get an electric vehicle

Around a quarter say their household intends to get an electric vehicle in the next five years, with younger people and higher income households more likely to say they will. Price, battery life, charging issues and lack of knowledge remain the main barriers.



Reasons unlikely to get an EV remain unchanged from 2019:

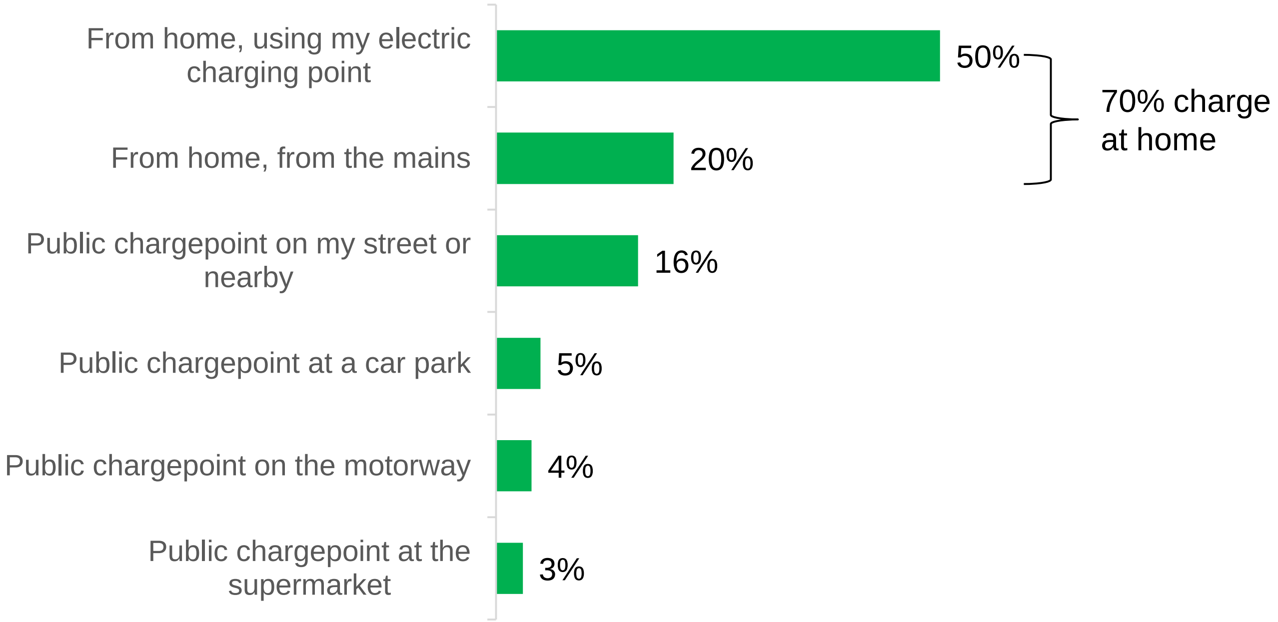
- Purchase price too high (59%)
- The range on a full charge is too short /short battery life (38%)
- Nowhere to charge near home (36%)
- Takes too long to recharge (26%)
- Don’t know enough: about how to maintain it (21%), about how much it will cost to run (21%), about reliability/safety (18%)

Most likely to get a plug in EV, profiles similar to 2019:

- Younger people (31% 16-34s, 24% 35-64s)
- ABC1s (29%/25% v 23% C2s, 19% DEs)
- Higher income households (29% v 15% lower income)
- Those engaged in energy market (26% v 22% disengaged)

QEV2. How likely would you be to change your household's car or van to an electric or plug-in hybrid one in the next five years? QEV3. Why do you say your household is unlikely to change to an electric or plug-in hybrid car or van in the next five years? Base: 2020 Total (4608), All unlikely to get an EV in the next 5 years (1733)

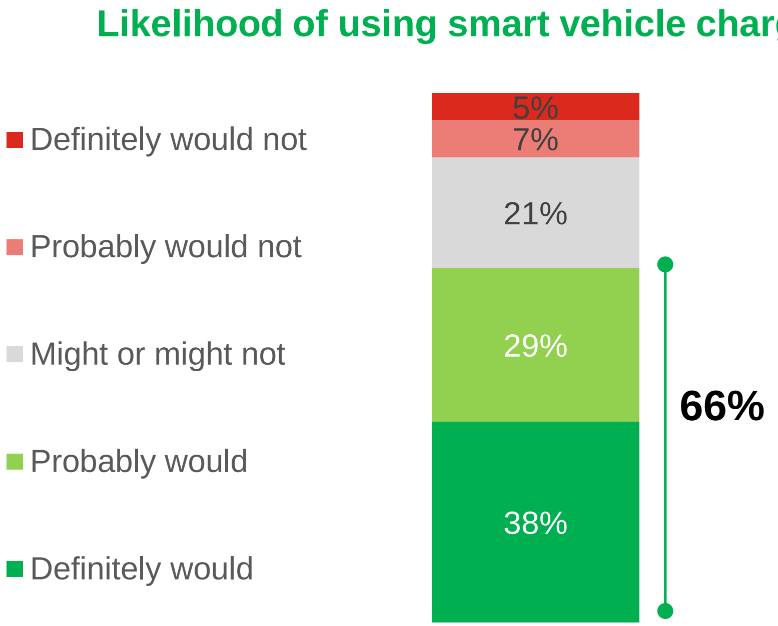
Over two thirds of plug in vehicle charging is done in the home



QWHERECH. Where do you usually charge your plug-in electric vehicle(s)?; QWHENAPP. Now thinking about the hours of 4pm-8pm on weekdays, which of these appliances do you tend to use at these times? Base: 2020 Plug in electric vehicle owners (215)

Many EV users are open to using smart charging for their EV

This shows that the concept of smart charging is of interest, however the survey doesn't explore comprehension.

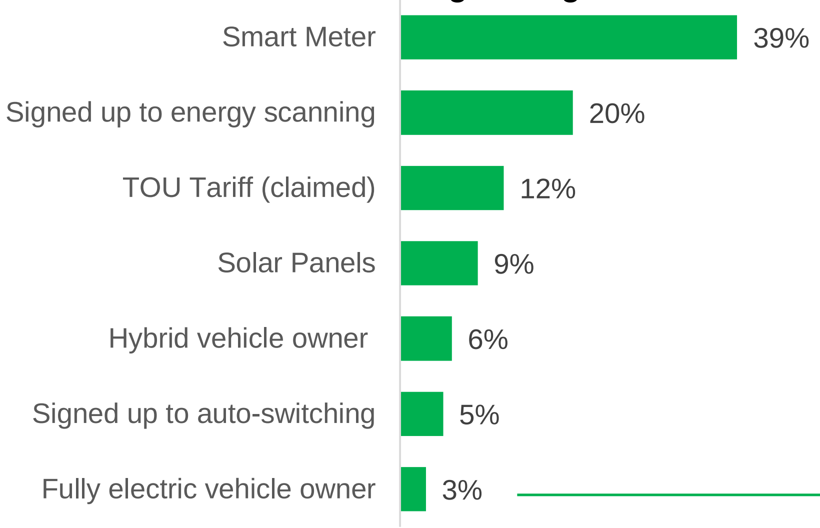


QINTCONT1EV. How likely would you be to use a system like this to charge your electric vehicle in order to reduce the cost of your household's energy bills? Electric vehicle owners 2020 (215); QINTCOMF. How comfortable or uncomfortable would you feel about an external company controlling when your appliances or heating run/appliances or heating run or when plug-in electric vehicles charge? Base: 2020 All with relevant appliances (4491)

Technologies in the home

Consumers owning EVs tend to use automated services to get a competitive energy tariff and use TOU tariffs.

Prevalence of low carbon technology and automated switching amongst households



Far more EV owners:

- Signed up to an energy deal scanning service (52%) or auto-switching (30%)
- (Say they) have a TOU tariff (44%)

APPLIANCE: Which, if any, of these appliances do you have in your household? Base: All respondents (n=4608)

Home heating and insulation

Home energy and home heating

At this point in time most homes use gas central heating. Awareness of alternatives such as heat pumps or hydrogen is relatively low, although there is strong awareness of electric heating.

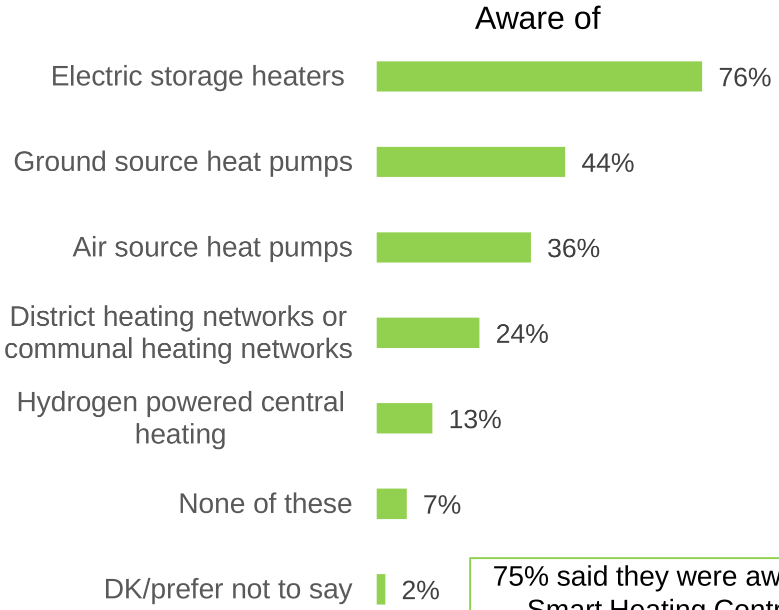
Openness to installing low carbon emissions home heating is relatively low, although younger consumers, those with higher incomes and those living in houses built in 1990 or later say they are more willing to adopt these.

The main barriers to adopting low carbon heating are high perceived costs, scepticism that it will save money and perceived disruption to install. Some of those who rent their homes feel their landlord would not allow installation.

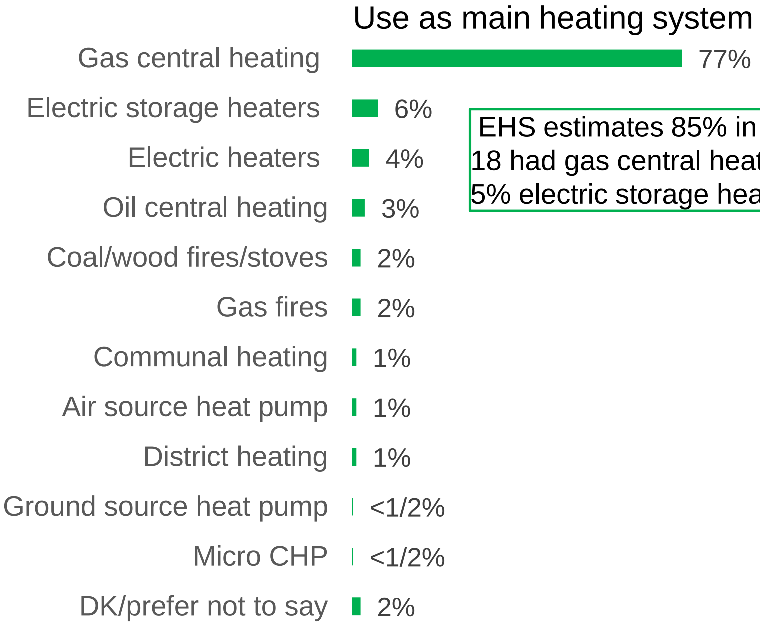
Willingness to upgrade home insulation is a little higher compared to home heating, but few are open to installing home micro-generation. Once again it is younger and more affluent consumers who express greater willingness to adopt, while high perceived costs, doubts about any savings being made once installed and perceived hassle are barriers to adoption.

Awareness and use of heating systems

Gas central heating is most commonly used in participants' homes. Around two fifths are aware of heat pumps and a quarter are aware of district/communal heating. Few are aware of hydrogen heating.



75% said they were aware of Smart Heating Controls

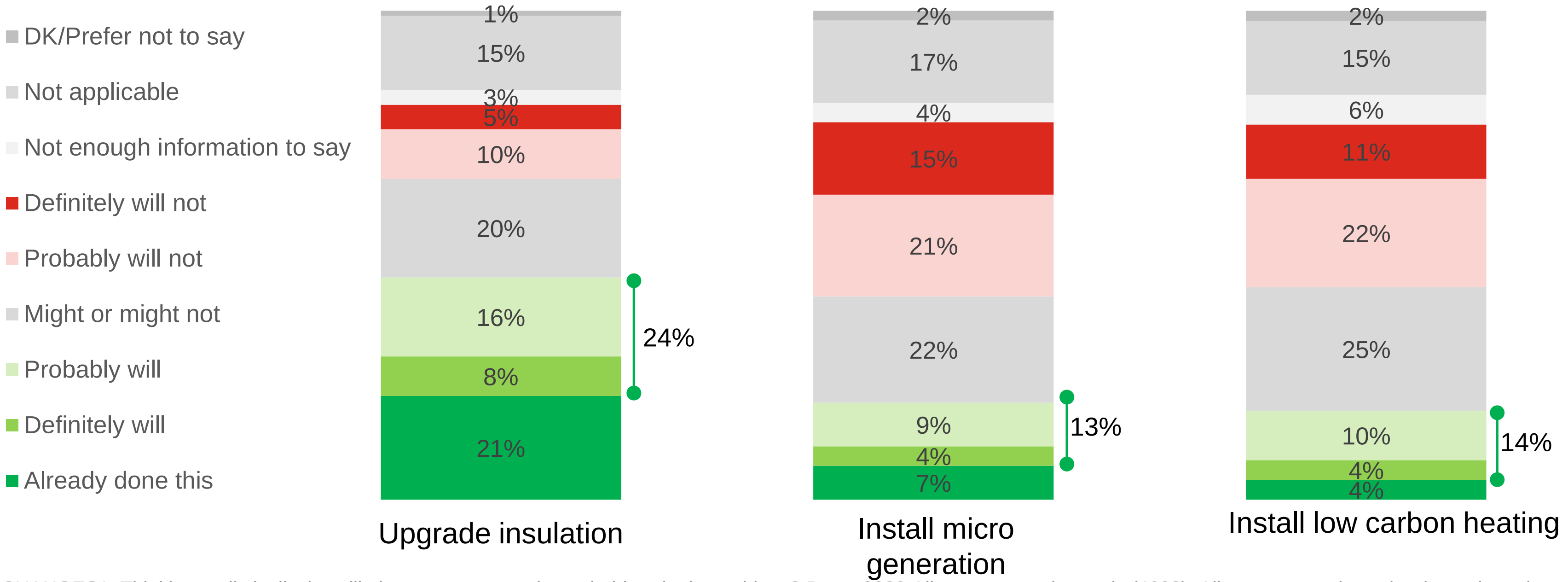


EHS estimates 85% in 2017-18 had gas central heating and 5% electric storage heaters

HEAT1. Which of the following types of household heating systems had you heard of before today? QHEAT2. And which is the main heating system that your household uses to heat the majority of your home in the winter? Base: 2020 Total (4608)

Decarbonisation - intentions

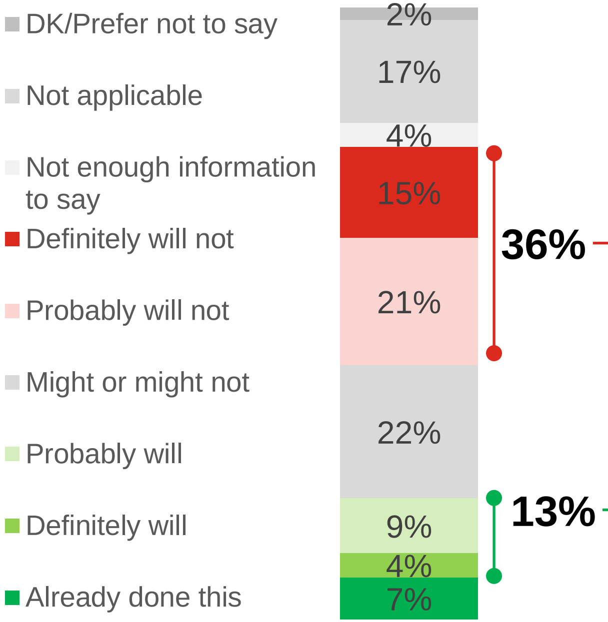
Around a quarter intend to upgrade insulation, but fewer intend to install micro-generation or low carbon heating, which may be linked to lower awareness of the systems.



QCHANGES1. Thinking realistically, how likely are you or your household to do these things? Base: 2020 All owner occupiers only (4603), All owner occupiers who do not have low carbon heating only (4469)

Intentions to install microgeneration

Younger people, higher income households and those living in houses are more likely to intend to install microgeneration. Main barriers are cost, hassle/disruption and lack of trust in new technology and installers.



Reasons will not install microgeneration:

- Cost is too high (64%)
- No guarantee it will save money (39%)
- Hassle/disruption of installation (24%)
- Don't trust installers (20%)
- Freeholder will not allow (13%)
- May make it more difficult to sell home in the future (12%)

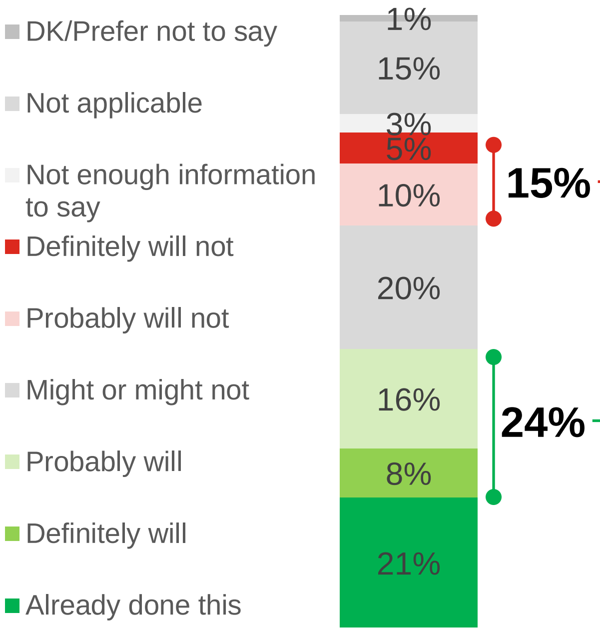
Most likely to intend to install

- Younger people (29% 16-34s, 11% 35-64s, v 5% 65+s)
- ABs (15% v 10-12% other social grades)
- Higher income households (14% v 10% lower income)
- Those living in houses (14% v 9% in flats), esp modern houses (18% 1990s+)
- Those engaged in energy market (15% v 9% disengaged)

QCHANGES1. Thinking realistically, how likely are you or your household to do these things? Install solar panels, turbines, combined heat and power system or some other way of generating electricity for your household Base: 2020 All owner occupiers only (4603), All unlikely to install 2020 only (1647, only responses given by more than 10% shown)

Intentions to upgrade home insulation

Similar groups intend to upgrade home insulation. Similar barriers to installation exist, but at lower levels



Reasons will not upgrade home insulation:

- Cost is too high (49%)
- No guarantee it will save money (25%)
- Structural considerations (10%), Freeholder will not allow (21%)
- Hassle/disruption of installation (16%)
- Don't trust installers (11%)

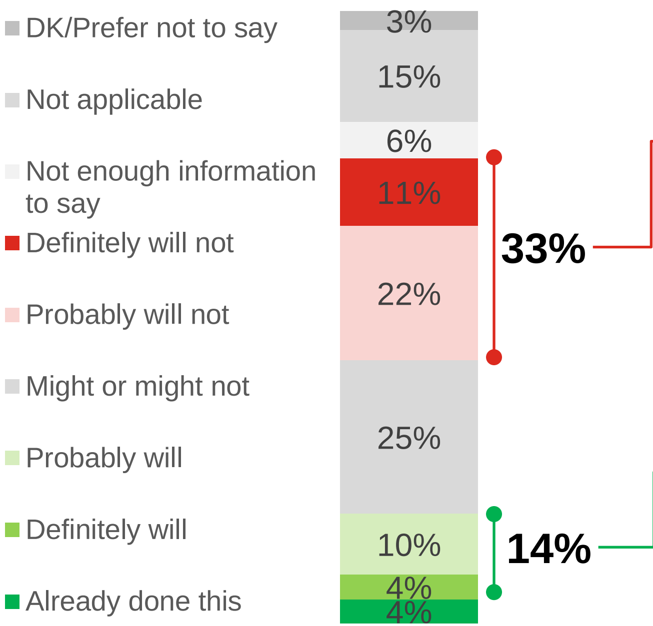
Most likely to intend to install

- Younger people (38% 16-34s, 23% 35-64s, v 13% 65+s)
- ABC1s (28%/24% v 19% DEs)
- Higher income households (27% v 17% lower income)
- Those living in houses (25% v 17% in flats)
- Those engaged in energy market (26% v 19% disengaged)

QCHANGES1. Thinking realistically, how likely are you or your household to do these things? Upgrade or improve how energy efficient your property is (e.g. installing insulation, draught proofing, new windows) Base: 2020 All owner occupiers only (4603), All unlikely to install only (713, only responses given by more than 10% shown)

Intentions to install low carbon heating

The same groups are interested in installing low carbon heating: younger people, higher income households, those living in houses. Barriers to installation are similar: cost, uncertainty, hassle, structural/freehold considerations.



Reasons will not install low carbon heating:

- Cost is too high (70%)
- No guarantee it will save money (37%)
- Hassle/disruption of installation (25%)
- Don't trust installers (15%)
- Concern in unproven technologies (14%)
- Structural considerations (12%), Freeholder will not allow (11%)

Most likely to intend to install

- Younger people (26% 16-34s, 14% 35-64s, v 6% 65+s)
- ABC1s (17%/15% v 10% DEs)
- Higher income households (16% v 11% lower income)
- Those living in houses (15% v 11% in flats), esp modern houses (20% 1990s+)
- Those engaged in energy market (16% v 11% disengaged)

QCHANGES1. Thinking realistically, how likely are you or your household to do these things? installing a heating system to your property that produces fewer carbon emissions (e.g. a heat pump or hydrogen boiler) Base: 2020 All owner occupiers who do not have a low carbon heating system (district heating, communal heating, air/ground source heat pump, micro CHP, hydrogen powered heating) only (4469), All unlikely to install only (1498, only responses given by more than 10% shown)

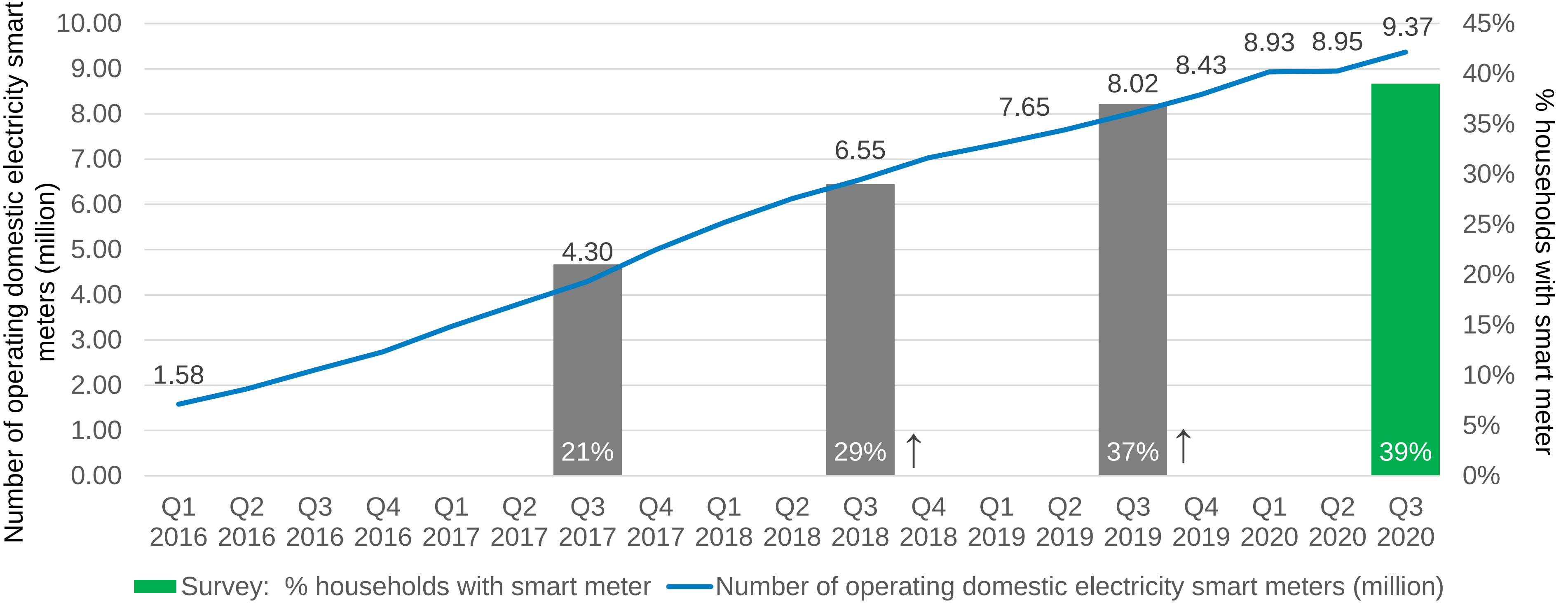
Smart meters and flexible energy use

Adoption of smart meters

The proportion of households with smart meters continues to grow, though the pace of installation slowed during the COVID 19 lockdown in 2020. Around three in five (59%) of consumers who don't have a smart meter intend to install in one in the next two years.

Significantly more consumers with smart meters understand how much energy is used around the household compared to those who do not have them. This type of knowledge of energy use may be helpful to the roll-out of solutions that encourage consumers to change when they use energy.

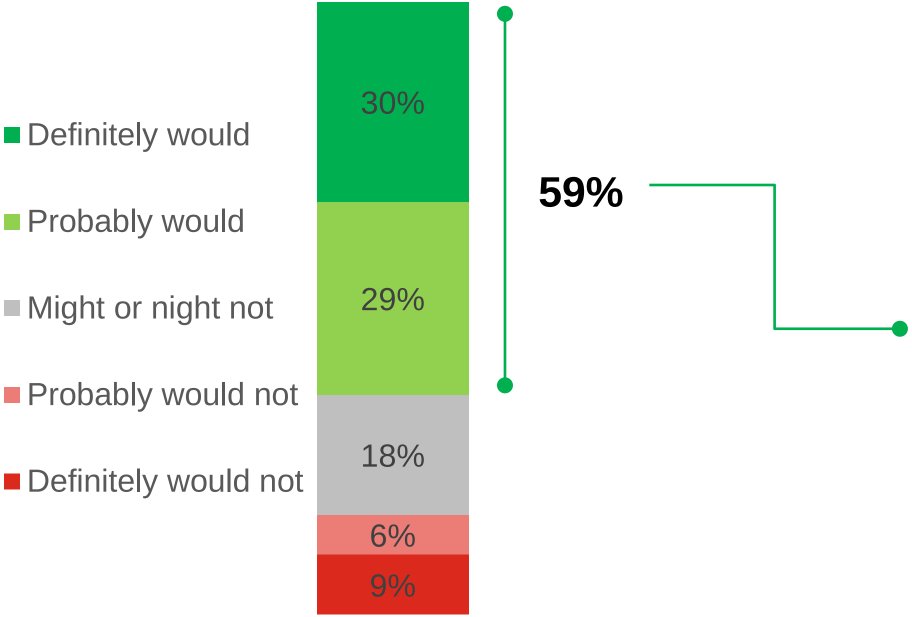
Smart meter installation increased in the past 12 months – but at a slower rate reflecting COVID restrictions



SM1 Have you heard of Smart meters? SM4 Do you have a smart meter? Base: Total 2020 (4608;)2019 (4001); 2018 (4064), 2017 (4001) NB Question change over time, comparisons should be treated with caution. ↑↓ indicate significant change between waves Smart meter operational data taken from https://www.gov.uk/government/statistics/smart-meters-in-great-britain-quarterly-update-september-2020

Who wants to install a smart meter?

Over half of those who don't already have one say they would install a smart meter. This is highest among younger people, and those in newer homes.



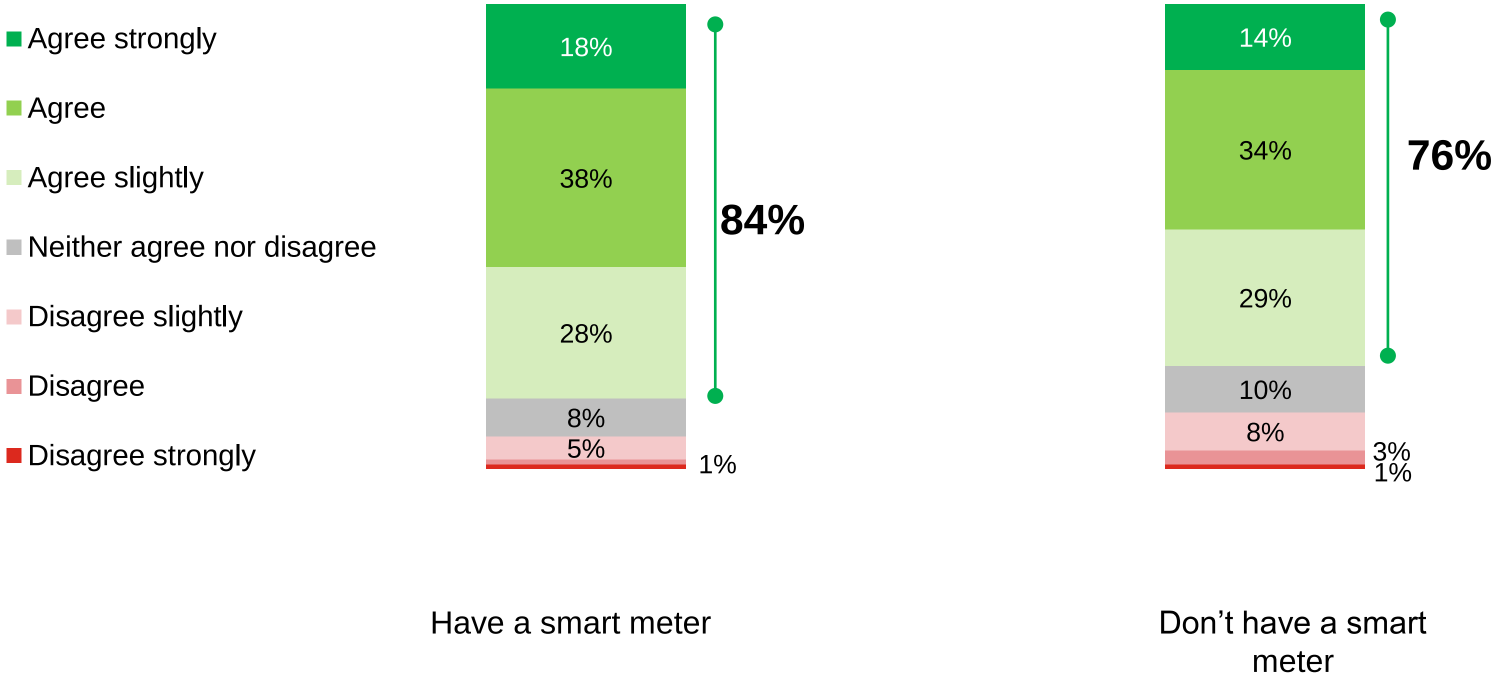
Highest among:

- 16-34: 83%
- Income £16k +: 64%
- Home built since 1990: 71%

SM9. How likely or unlikely would you be to install a smart meter in the next two years? Base: 2020 All who do not have smart meter installed (260)
*. Estimate does not take into account other external factors e.g. the proportion of population renting who may not be able to install a smart meter without landlord's permission

Consumers who have a smart meter have greater awareness of their home energy use

% who are aware of how much energy they use around their home



ENG. Thinking about energy generally. To what extent do you agree or disagree with the following statements? Base: 2020 Total (4608)

Key messages: Using energy flexibly

Consumers shifting when they use energy (flexibility) will play an important part in the transition to net zero greenhouse gas emissions.

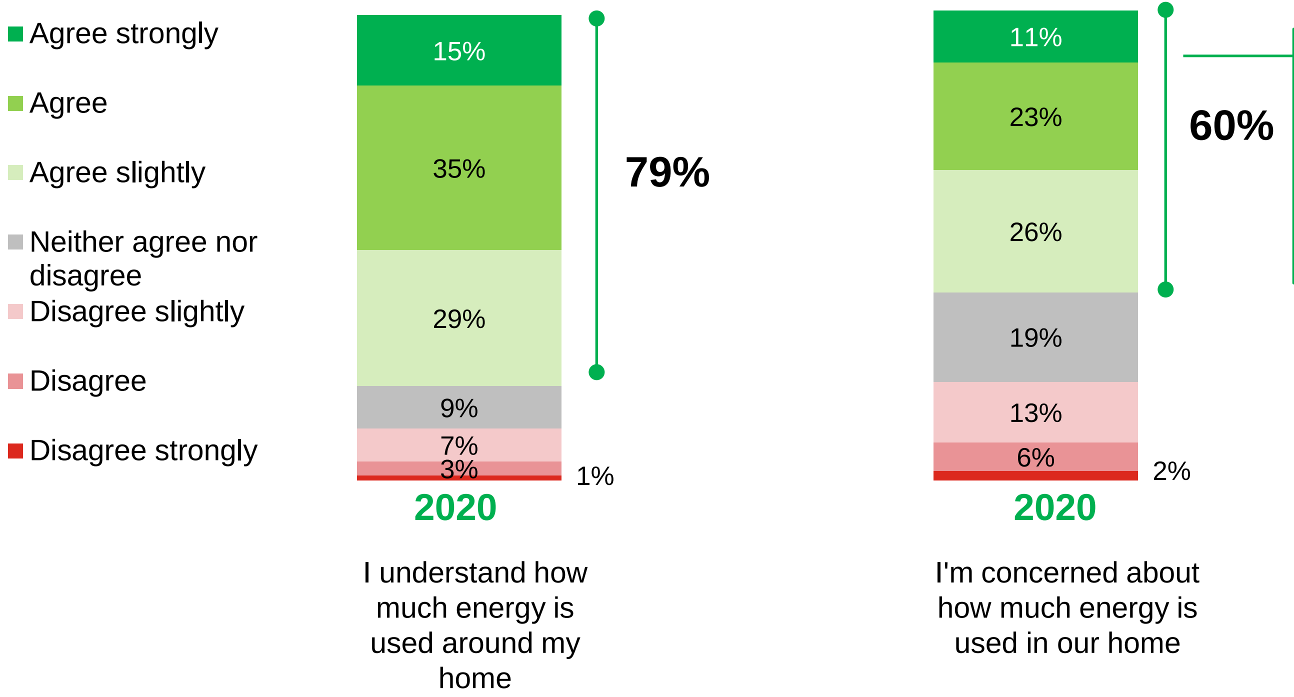
Consumers generally have an awareness of how much energy they use around the home and most realise there are peak and off-peak demand times for energy. Around a third use appliances during peak times and most of these consumers acknowledge it could be easy to change when they use these appliances. However, it's likely they would need an impetus to actually make a change.

Appliance use needs to fit around people's lifestyles. Working or school patterns may make it difficult for some to change behaviours, while others find it difficult to plan. At this point in time, consumers don't express great openness to the idea of using products and services that help them use energy flexibly e.g. smart appliances or smart heating, although these concepts are new to consumers so they may not understand their benefits. However, nearly two thirds of EV owners are open to using smart charging and claimed adoption of TOU tariffs in higher.

When asked about external control of appliances, most consumers express discomfort with the idea, with many raising concerns about data sharing, a lack of trust in external companies and fears about the safety of running an appliance remotely or when no one is home.

Salience of energy use

Most consumers understand how much energy they use in their homes, and many are concerned about how much they use.



Concern is higher among those who intend to install smart meters, (79%), EV owners (75%) and those in arrears on their bills (75%)

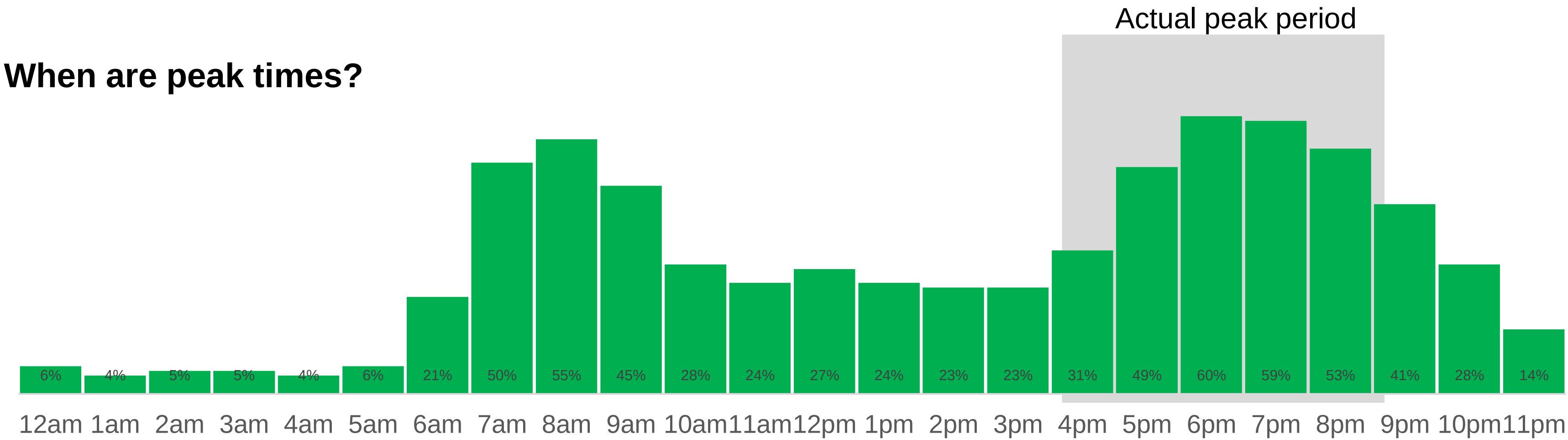
ENG. Thinking about energy generally. To what extent do you agree or disagree with the following statements? Base: 2020 Total (4608)

Awareness of peak and off-peak energy times

Consumers have a general awareness that there are peak and off-peak demand times for energy, which are most commonly believed to be the hours either side of a traditional working day.

81% of consumers are aware of peak and off peak energy periods

When are peak times?



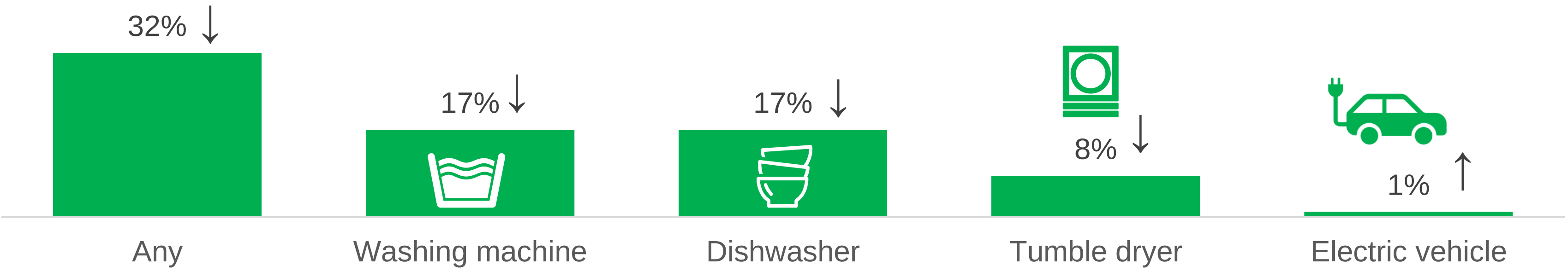
QPEAK. Before today, were you aware that there are peak and off-peak times for energy usage? Base: 2020 Total (4608); QPEAK2. And what time(s) of day do you understand as being peak time for energy usage? Base: 2020 Aware of peak and off-peak periods (3703) QPEAK3. Is your household on a tariff where you pay less for energy used off peak, called a 'time of use' tariff? Base: 2020 Total (4608)

Use of appliances during peak demand times

Around a third (32%) say they tend to use appliances/charge at peak times.

This is lower than in 2019 (45%), which may reflect changes in working patterns in the past 12 months.

% who use relevant appliances at peak times

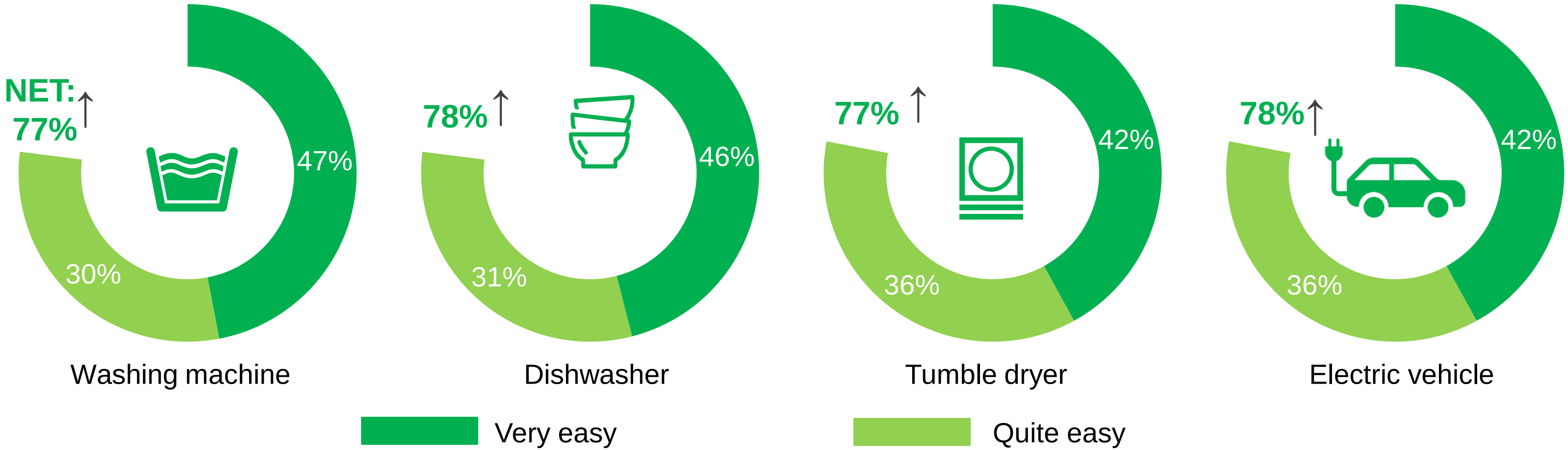


APPLIANCE. Which, if any, of these appliances do you have in your household?; WHENAPP. Which of these do you tend to use on weekdays between 4pm and 8pm? Base: 2020 Total (4608)

Most of those using appliances at peak times acknowledge it might be easy to switch to off-peak usage

This has increased compared to 2019, although this may be an outcome of increased home working in 2020 due to the COVID-19 pandemic.

% who think it would be very / quite easy to switch to off-peak periods



LOADSH. How easy or difficult would it be for your household to change when you do these things to when there is less demand for energy? Base: 2020 All participants who use each appliance in peak times: washing machine (1451), dishwasher (976), tumble dryer (1027), electric vehicle (142)

Key barriers to changing when appliances are used

The main barrier to changing when appliances are used is that it doesn’t fit with lifestyles – due to working/school patterns or difficulties in planning.

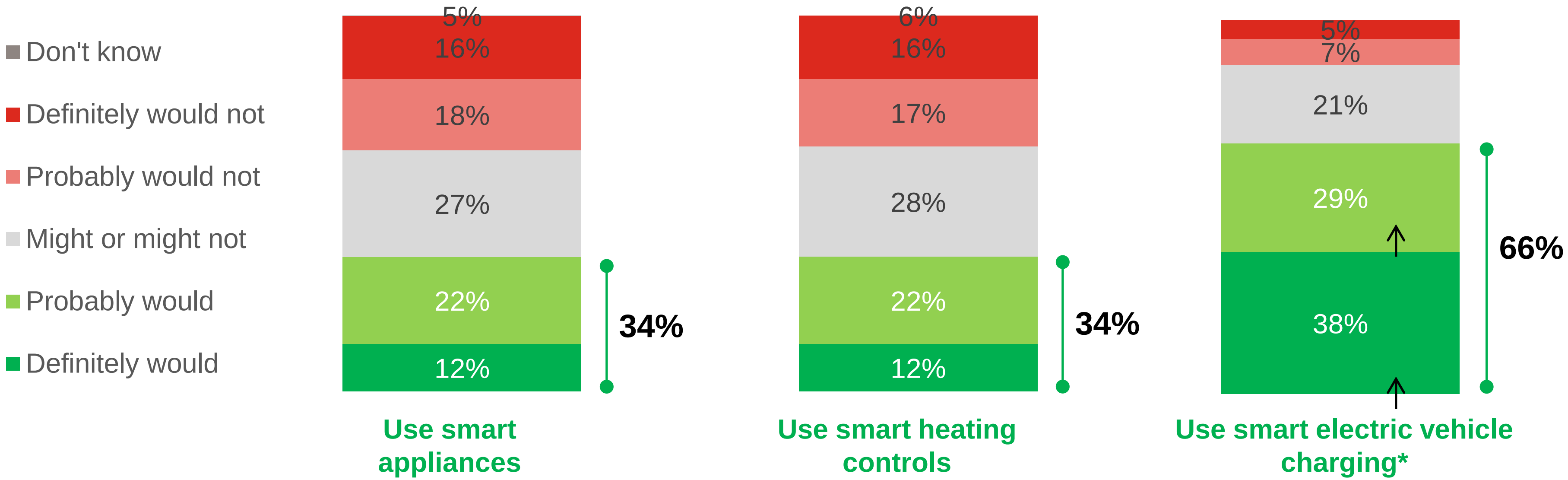
47% of UK workers did at least some of their work from home in April 2020[1]

WHATPRE. Can you tell me a bit about what prevents your household from being able to <use appliances> at a time when there is less demand for energy (e.g. to the middle of the day, or overnight)? Base: 2020 All participants who feel it would be difficult to load-shift (252).

[1] Coronavirus and homeworking in the UK: April 2020 (ONS).

Openness to using smart technology*

There is relatively low appetite for smart appliances or smart heating among the population, but two thirds of EV owners are open to smart vehicle charging.

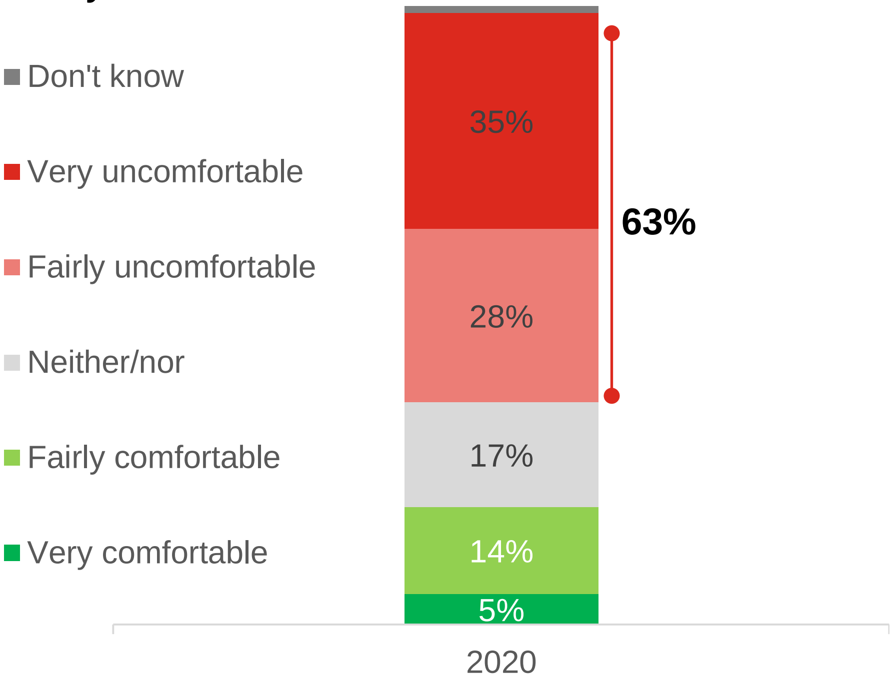


* Smart technologies can be set to run automatically at times when there is lower demand for energy

QINTCONT1APP. How likely would you be to use appliances like this to reduce the cost of your household's energy bills? Base: 2020 Total (4608); QINTCONT1HC. How likely would you be to use a home heating system like this to reduce the cost of your household's energy bills? Base: 2020 Total (4608); QINTCONT1EV. How likely would you be to use a system like this to charge your electric vehicle in order to reduce the cost of your household's energy bills? Base: 2020 Among EV users only (215)

Comfort with external control of appliances

Most consumers are uncomfortable with the idea of an external company controlling when appliances run. Safety fears, lack of trust in external companies and concerns about data sharing are key barriers.



Why feel uncomfortable?

Safety concerns (e.g. risk of fire, flooding) (61%)

Concerns company might not switch things on (56%)

Concerns around data sharing (54%)

Wouldn't trust the company with this information (53%)

Concerns around cost of appliances (41%)

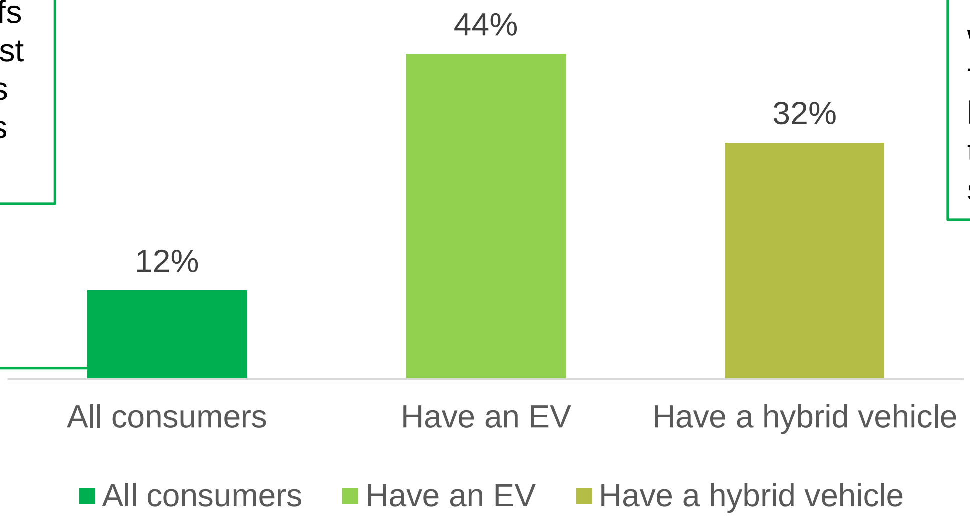
INTCOMF. How comfortable or uncomfortable would you feel about an external company controlling when your appliances? Base: 2020 All participants with relevant appliances (4491)
WHYCOMF. Why do you say you would feel like that about using the service we've just discussed? Base: 2020 All participants who are uncomfortable (2785)

How many consumers believe they're on a TOU tariff?

12% claim they're on a TOU tariff, with usage highest among EV owners.

% of consumers who say they are on a TOU Tariff

Stated use of TOU tariffs is also higher among first time supplier switchers (41%) and consumers aged 16-34 (20%).



Due to comprehension issues with survey questions on TOU tariffs we haven't differentiated between legacy time of use tariffs e.g. Economy 7 or newer static or dynamic TOU tariffs.

QPEAK3. Is your household on a tariff where you pay less for energy used off peak, called a 'time of use' tariff? Base: 2020 All consumers (4608), Have an EV (147), Have a hybrid vehicle (308); Have solar panels (390)

Final word

This research highlights that there are some consumers who have adopted behaviours that will reduce greenhouse gas emissions, such as purchasing an EV, but they are still the minority.

Consumers who own EVs appear to be more familiar with terms related to decarbonisation and indicate they’re more willing to change other behaviours to help reduce the impact of climate change. However, we cannot assume that consumers who adopt EVs or other low carbon emissions technologies in the future will have the same behaviours or intentions. Further research needs to be undertaken to understand the journey to adopting low carbon emissions technologies.

Ofgem will continue to conduct research to understand consumer attitudes and behaviour in this sphere. This will be used to inform our policy development around the energy transition and net zero and help us to facilitate the behaviour changes needed while also protecting consumers.