The road to net zero: UK public preferences for low-carbon lifestyles

CAST BRIEFING 14 - SEPTEMBER 2022

Centre for **Climate Change** and **Social Transformations**

CAST is a global hub for understanding the role of people in shaping a positive low-carbon future. Based at the University of Bath, our additional core partners are Cardiff University, University of East Anglia, University of Manchester, University of York and the charity Climate Outreach.

Executive Summary

Reducing carbon emissions in line with the Paris Agreement, and keeping warming to below 1.5 degrees, will require substantial changes to lifestyles, including the adoption of low-carbon technologies and changing travel, heating, diet and material consumption behaviours. A series of UK workshops were held, with diverse members of the public, to deliberate over low-carbon lifestyle strategies.

The briefing presents public perceptions and preferences for each area of lifestyle change before concluding across all four. Use the below to navigate to each section to find out more:

HOW WE HEAT OUR HOMES page 7

THE FOOD WE EAT page 10

THE PRODUCTS WE BUY page 13

HOW WE TRAVEL page 16

Key findings and conclusions across all four areas of lifestyle change:

- Many low-carbon strategies were perceived as feasible and desirable options, including those that support people to: reduce car use, improve the heating performance of buildings, transition to healthier diets with less meat, and engage more in the sharing economy.
- Many strategies to reduce carbon emissions within these four lifestyle areas were still unfamiliar to people, and there was a general lack of awareness of the extent to which changes need to occur to meet carbon targets. Education and information provision is therefore still viewed as an important aspect for informing people's choices.
- While maintaining personal choice and freedoms were important, only very radical strategies such as living car free, no flying, living in smaller homes, or eating meat-free diets were seen as too restrictive.
- Public acceptance of many strategies is, however, contingent on additional investment and support from institutions (e.g. government and businesses). Without that, participants found it difficult to imagine how they could engage in further emissions reduction actions.

Recommendations that arise from this work include:

- Provide clear and consistent information about low-carbon choices and the need for change.
- Use existing lifestyle choices as reference points for further changes.
- Set a positive vision for net zero futures with clear examples for low-carbon living.
- Invest in infrastructure to make low-carbon lifestyles more accessible, convenient and financially viable.
- Radical polices are possible and could be desirable, but people require a feeling of fairness and financial support to be able to engage with them.

INTRODUCTION

The UK was the first country in the world to introduce legislation to achieve net zero emissions by 2050 [1], which will require a rapid transformation of every sector of the economy and society. While technological solutions, such as carbon capture and zero-emission airplanes, play an important role in reaching net zero, many of these are not yet proven to deliver carbon reductions or available at scale [2, 3]. Even where technological solutions exist, they require public buy-in and changes to how we live [4, 5]. Most of the emissions reductions will have to come from changes in demand. The 6th assessment report from the IPCC [6] estimates that changes to our lifestyles and behaviour can result in a 40-70% reduction in greenhouse gas emissions. The role of the public in driving the low carbon transition has never been clearer, or more urgent.

Public concern about climate change is at a record high, even in the wake of the Covid-19 pandemic. Recent CAST findings show that 70% of people in the UK think that drastic changes are needed in the way we live in order to tackle climate change [7]. Questions however remain about what transformational lifestyle changes might look like, which ones are perceived as feasible and desirable, and which ones are not.

This briefing explores public preferences for low-carbon lifestyles that emerged from a series of deliberative workshops held with a diverse sample of participants across the UK in 2020/2021. The workshops covered four areas of possible lifestyle change (heat, diet, products, mobility). These are areas that currently produce a significant proportion of the UK's carbon emissions and for which reducing emissions has so far proved challenging:

HOW WE HEAT OUR HOMES

THE FOOD WE EAT

THE PRODUCTS WE BUY

HOW WE TRAVEL

The workshops engaged participants with their own carbon footprints and possible ways to reduce these through adopting evidence-based low-carbon lifestyle strategies. These strategies were presented as cards to participants (see pages 5 and 6). The briefing presents participants' responses to these low-carbon lifestyle cards and discusses ways forward to support public acceptance. The briefing first presents findings for each of the four areas separately before drawing conclusions across all four, followed by policy recommendations for encouraging low-carbon lifestyle change.

Methodology

Location and sample: Six workshops were held in three locations (two each in Devon, Aberdeen, Manchester) with a diverse sample across age, gender, income and ethnicity. The total sample consists of N=46 participants with an even gender split and at least two ethnic minority or Eastern European participants per workshop. Participants were over 18 with an even distribution across age brackets in each workshop. For each location, one group was sampled approximating high-emitters and one group was sampled approximating low-emitters.

Workshop activities: Prior to the two-day workshop, participants completed a carbon footprint exercise based on the WWF carbon footprint calculator. On the first day, participants discussed their individual carbon footprints to link their lifestyle choices to carbon emissions. This was followed by a session in which people deliberated low-carbon lifestyle strategies for each of the four areas (heat, diet, products, mobility). This was aided by the introduction of lifestyle cards presented in this briefing (see Box 2 for details). After initial deliberations, participants completed a survey in which they were prompted to select a number of cards per area as possible ways to reduce their personal carbon footprints. Subsequently, each participant discussed their choices in small groups.

On the second day, participants took part in activities exploring the low-carbon communities and lifestyles through future visioning and character development exercises. Similar workshops were also conducted in Sweden and China. Findings from these additional activities will be reported in future outputs.

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Low-carbon lifestyle strategy cards

In the workshop, participants were presented with a series of cards that summarised strategies to reduce carbon emissions through lifestyle changes. These strategies were developed around the Avoid-Shift-Improve (ASI) framework [2]. We used the ASI framework to structure and translate high-level carbon mitigation options from the literature into lifestyle choices.

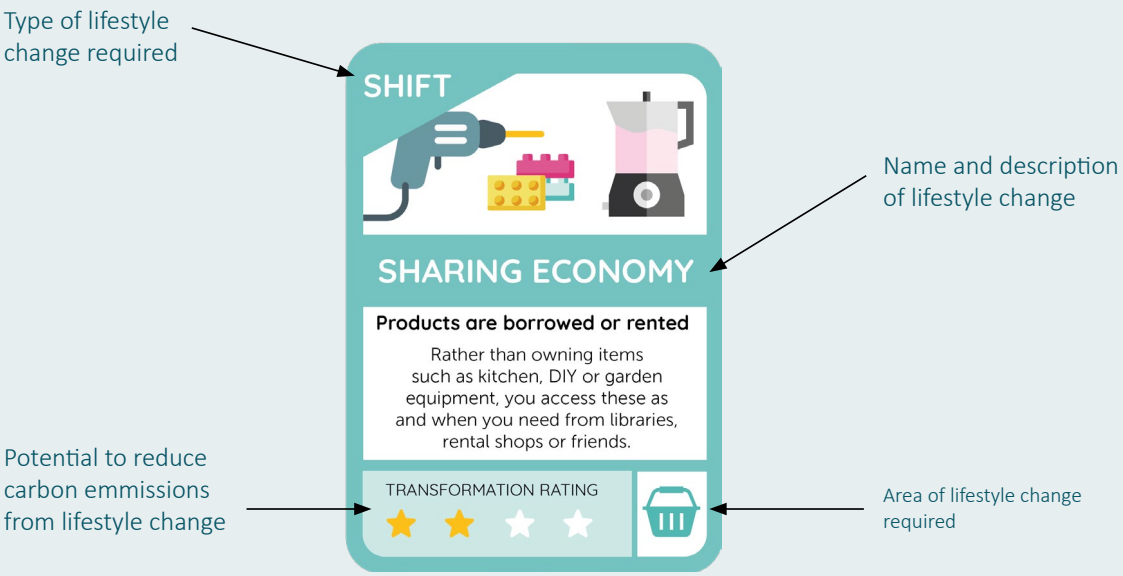
Cards were categorised into:

AVOID (do less) = doing fewer high carbon activities and/or buying fewer high carbon products and services (e.g. avoiding a car journey, buying less, reducing home temperatures)

SHIFT (do differently) = accessing activities, products and services in different, lower carbon ways (e.g. travelling by train, eating a vegetarian diet, using electric heat pumps)

IMPROVE (do better) = buying or accessing products and services that produce fewer carbon emissions (e.g. buying an electric car, improve product standards)

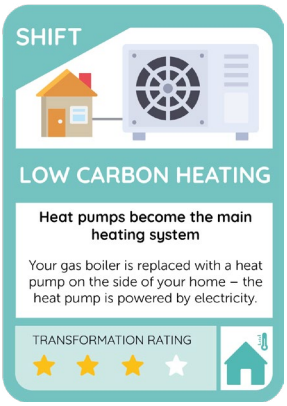
Each card had a brief explanation of the strategy and a transformative rating (from 1 to 4 stars), indicating the potential impact on reducing personal carbon footprints [8]. All cards are presented in the relevant sections in this briefing. An example is displayed below:



HOW WE HEAT OUR HOMES

Carbon emissions from homes account for approximate 15% of UK carbon emissions and around 11% of personal carbon footprints [9]. Reducing emissions will require changing heating systems, which are predominantly reliant on gas central heating currently, improving the energy efficiency of buildings and changing heating practices to reduce overall energy use [10]. There are also a number of co-benefits that may be achieved if the strategies are applied, such as reduced energy bills and improved health outcomes.

Heat pumps



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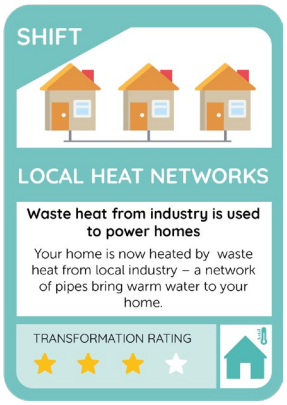
Heat pumps were seen as a viable option, but more expensive and less likely to provide people with the same experience as current gas boilers.

Local heat networks



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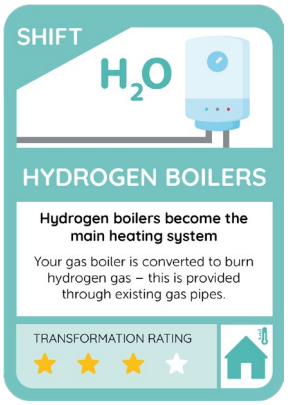
Heat networks, while considered good if waste heat is being used, were seen as less suitable for many areas and more disruptive than other options.

Hydrogen boilers



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Hydrogen boilers were favoured predominantly because they were seen to replace natural gas with minimal disruption. Hence hydrogen boilers were seen as less disruptive and cheaper than the other two strategies; and considered quicker to implement because they were seen as most compatible with existing infrastructure.

Heat pumps as costly and disruptive:

"I watched an article last night regarding this new heating pump that's being developed, and I actually, I watched a guy installing one. And it was a hell of a lot of work to get this system into someone's house, like a lot of upheaval. And well over £20,000 for this person to get it installed."

(Desmond, Aberdeen)

Hydrogen as least disruptive and cheapest:

"I picked that [hydrogen boilers] just because I felt that was the least impact, and would be the cheapest option"

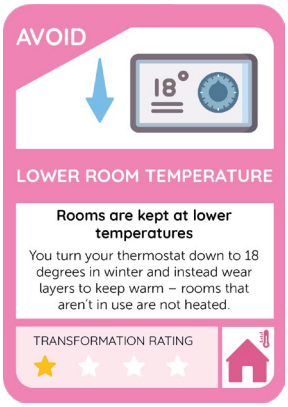
(Emily, Devon)

+/- = mixed responses

+ = positive responses

– = negative responses

Lower room temperature



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Lowering room temperature was perceived as a strategy that everyone could easily do with minimal disruption.

Smaller homes

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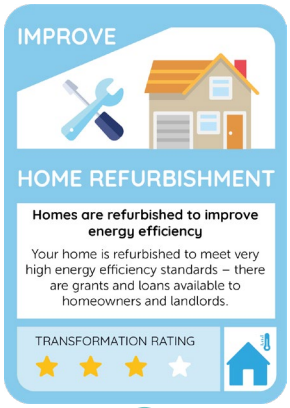
Living in smaller homes (or increasing occupancy of existing homes) was not considered socially acceptable or feasible. People aspire to live in larger home as a reward for working hard.

Home refurbishment



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Building standards

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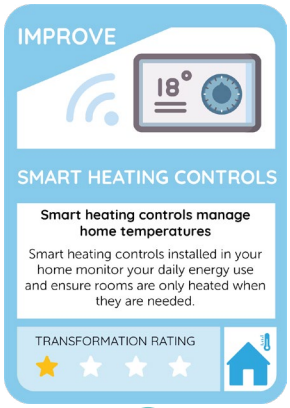
Smart heating controls



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All strategies that improve the heating performance of buildings were considered desirable. Co-benefits that make these strategies popular include better health and lower bills. People however questioned who should be responsible for the costs of implementing these strategies.

Smaller living space – not socially acceptable:

"If you wanna earn, save up and get a bigger house, you know, that's something that we've all kind of had stuck into us […] So I think it's gonna be a hard sell, to be honest, even for the younger generation"

(Frankie, Devon)

Unfair to ask people to shoulder costs of home refurbishments:

"I think it's a good idea, but I think it's gonna be costly. I know they said they'll do loans or grants, but I think maybe it should be more Government funded. I don't think it's fair for people to be losing money and for people that are already in a difficult financial situation to have the pressure of that put on them as well"

(Lottie, Manchester)

+/- = mixed responses + = positive responses – = negative responses

Conclusions for public acceptance

Awareness and knowledge of low-carbon heating systems remain very low among the UK public, especially among non-homeowners. Initial responses to strategies that shift heating to low-carbon forms including heat pumps, heat networks and hydrogen boilers were relatively mixed but hydrogen boilers were generally favoured over heat pumps, while heat networks were considered least favourable. It should be noted that public preferences for reducing carbon emissions from heating are likely to shift and change depending on how options are developed and implemented. Hydrogen boilers may be easier to sell to the public at first, but a note of caution should be added as public acceptance is likely dependent on positive impressions of hydrogen boilers becoming true. If hydrogen turns out to be more expensive or involve more disruption than expected, initial positive impressions may wane. In contrast, heat pumps are already commercially available and may be developing a reputation for being costly and disruptive. This was however not the case across all participants with some positive perceptions of heat pumps also evident.

Strategies to improve or reduce overall heating use were generally viewed positively, with the exception of living in smaller homes. These strategies already enjoy being socially acceptable and were perceived as feasible, especially if they also bring other health or financial benefits. However, questions about responsibility and cost were raised; it was not considered fair to ask people to shoulder all the costs of refurbishments and installing new technologies without adequate support from industry and government. This remains an important condition for public acceptance.

THE FOOD WE EAT

Emissions from food account for approximate 17% of UK carbon emissions and around 25% of personal carbon footprints [11]. Animal products make up the greatest share of this footprint, especially beef and lamb [12]. While changes to land use and agricultural practices will be essential for reducing emissions in this sector, changes to diets and reducing food waste are also needed [13]. There are a number of co-benefits associated with these strategies, such as improved health and biodiversity outcomes. In the UK, we eat more than double the amount of meat than is considered healthy, which is linked to a number of life-limiting diseases [14]. Industrialised farming also causes deforestation, poor animal welfare and biodiversity loss [12].

Vegan diet

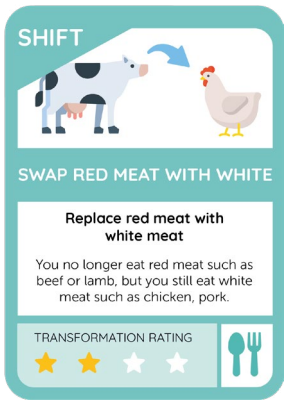
Vegetarian diet

Fully vegetarian/vegan diets were generally perceived as too restrictive and involving too much of a change for most people- at least in the near future. There were also concerns about vegan diets being unhealthy and detrimental to the livelihoods of farmers. Despite some strong reactions against vegan diets, a minority of participants described positive experiences with vegan food and could imagine adopting a vegan or vegetarian diet.

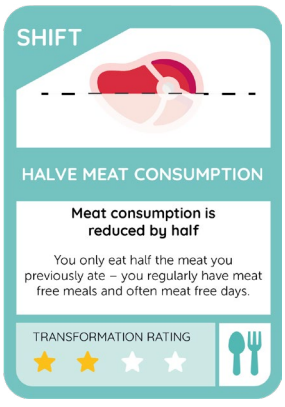
Balanced diet

Adopting a balanced diet[1] was seen as the most desirable and achievable. It was seen as a healthy option that would also have a big impact on emissions while not being too restrictive.

Swap red meat for white meat



Halve meat consumption



Halving meat consumption and swapping red meat for white meat were considered desirable and achievable alongside eating a balanced diet. These strategies were seen as quick and easy changes that many people would be able to make.

Positive vegan food experience:

"We have a new restaurant opened, just before the lockdown. It's Indian, and it's all vegan, and I guarantee if you go there and have a meal there, you would be - you'd be transformed - just how good vegan food can be"

(Mary, Manchester)

+/- = mixed responses + = positive responses − = negative responses

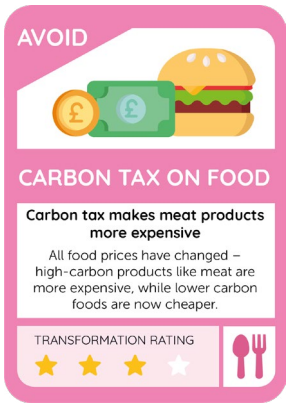
[1] *Following guidelines for a varied and healthy diet based on about 2000kcal a day – eating less meat, dairy, and processed food. In the UK, people are estimated to eat double the amount of meat per year than is recommended for a healthy diet.*

Reduced meat options

+/-

Responses were mixed for reducing meat options in supermarkets and restaurants. In principle, this was considered necessary and a good way to help people reduce their meat consumption, but not if choices were restricted too much. Increasing vegan and vegetarian alternatives was considered a better way to change the available choices.

Carbon tax on food



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Carbon taxes to encourage reductions in meat consumption (by making meat and meat products more expensive) divided opinion. Some felt that this was the only way to encourage change as people won't make lifestyle changes without financial incentives, while others felt the opposite, that even if prices increase, people that want to eat meat will still buy it.

Less food waste

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Reducing food waste was viewed as essential and something everyone could do. Participants described how they were aware that they currently waste food and displayed guilt in admitting that this was something they personally needed to address. Others described strategies that they already used to avoid waste (e.g., meal planning).

Local and seasonal food

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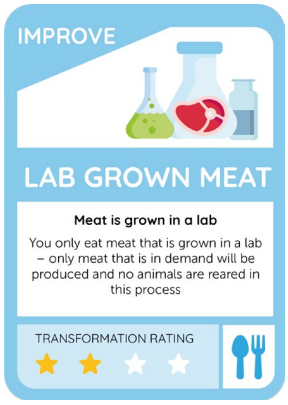
Eating local and seasonal foods was viewed positively and linked to ideas around local foods being healthier, of higher quality, and representing a more traditional way of eating.

Lab grown meat



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Initial reactions to lab-grown meat were generally negative. It was perceived as 'unnatural' and associated with a sense of weirdness and disgust. A small number of participants were willing to try lab-grown meat, seeing it as progress with a few concerns around safety and health.

Wasting food as something most are guilty of:

"[Wasting food] is a big thing I think we do. We waste a lot of food and I think that's something that we're all guilty of and I think we need to look at that and try and, you know, buy what we need."

(Sally, Aberdeen)

Carbon tax on (red) meat as fair:

"I think if I'm choosing to buy beef, it's a choice, and it's the same as people that buy cigarettes or people that buy alcohol. The taxes get put on them, so I think it would only be fair, I'd be a hypocrite if I say people that go on aeroplanes should be taxed more and then, on the flipside, I'm saying, "Well, I don't want to be taxed more for eating red meat or eating meat."

(Ben, Manchester)

+/- = mixed responses
+ = positive responses
– = negative responses

Conclusions for public acceptance

Strategies to reduce waste and increase the consumption of local and seasonal food are likely to be strongly supported by people. Limiting meat consumption is likely to be more challenging in terms of public acceptance, especially drastic reductions and bans. While an approach based on moderation and balance is likely to be accepted (e.g. reducing overall meat consumption, swapping red with white meat etc.), meat-free diets are considered less socially acceptable and viewed as unnecessarily restrictive. There are however indications of shifting norms around vegan and vegetarian diets, with participants discussing positive experiences with, and openness to incorporating, vegan and vegetarian options.

It is also likely that strategies that increase the price of meat and meat products and/or reduce the availability of meat options may be met with resistance. Perceptions of fairness were important for preferences. There was a strong concern for those on low incomes, as many felt carbon taxes would have a disproportionate impact on poorer families. In contrast however, some felt it was fairer that if someone did not want to reduce meat consumption then they should have to pay for it.

Therefore, strategies to reduce carbon emissions from diets are likely to achieve much higher levels of social acceptability if they do not disproportionally affect lower income groups and do not overly restrict choice. For example, maintaining some level of choice in meat products while increasing the availability and quality of meat-free alternatives could be an approach that is more widely accepted.

THE PRODUCTS WE BUY

Carbon emissions associated with purchasing products like clothing and electrical appliances account for approximately 6% of personal carbon footprints . Waste is an additional problem; for example UK households produce around 127 thousand tonnes of electrical and electronic equipment in the second quarter of 2021 [15]. Reducing carbon emissions and waste from products will require a change to the design and use of products, with new business models needed to encourage better standards and increased repairing and sharing of products rather than buying new (i.e. circular economy models) [16, 17]. There are also a number of co-benefits associated with these strategies such as reduced soil and ground water contamination from less landfill waste, and less animal and plant-species habitat destruction.

Second hand products

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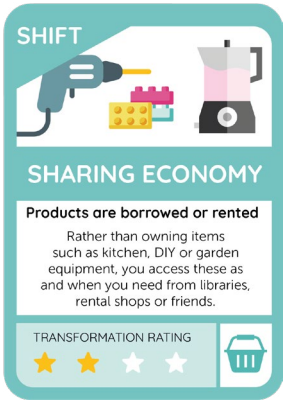
Purchasing and using second hand products was considered feasible and generally viewed positively. For some products, purchasing second hand is becoming more normalised (e.g. through internet platforms), although there remains a stigma associated with second hand products and a perception that they can be lower quality.

Sharing economy



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Perceptions around the sharing economy were generally positive with only minor concerns around cleanliness . People drew on examples of sharing initiatives (e.g. library of things), but the idea of leasing or renting products is still somewhat unfamiliar to people. Co-benefits of community cohesion were also recognised as arising out of informal neighbourhood sharing initiatives.

Paying for services

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Paying for services was the least favoured strategy. This strategy was linked with current leasing or subscription models (e.g. for mobile phones or cars), which are viewed as more expensive in the long run compared to purchasing outright.

Sharing economy as a positive idea for communities:

"I love that idea because it almost feels like a grass roots sense of community type thing that anybody can set up. We could do it now and I've never thought of it before, and it's so simple but it's actually a really nice thing to do. "

(Frankie, Devon)

Second hand products as something easy to do:

"the 'second hand products,' is an easy one because I do take a lot of my clothes to charity anyway…then I do buy some stuff off Facebook marketplace anyway, um, so I think it's an easy thing for me to do"

(Lottie, Manchester)

+/- = mixed responses + = positive responses – = negative responses

[2] *This figure includes emissions associated with production only, and not emissions from product use.*
[3] *It should be noted that the workshops were done during the second Covid-19 lockdown where concerns about cleanliness could have been higher than normal.*

Buying less

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The idea of buying less stuff is something that was viewed positively and seen as achievable by everyone. Many believe they are already engaging in this strategy, whereas others reflected on how many things they purchase due to current consumer culture.

Carbon labels

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Carbon labelling was viewed as feasible and desirable. People felt more information to aid choices needed to be available and labelling would be a good solution.

Carbon taxes

+/-

Carbon taxes were viewed as feasible, and signalling carbon emissions through price was considered a way to inform people's choices. Nonetheless, overall responses were ambivalent with few hostile or clear positive responses.

Personal carbon budgets

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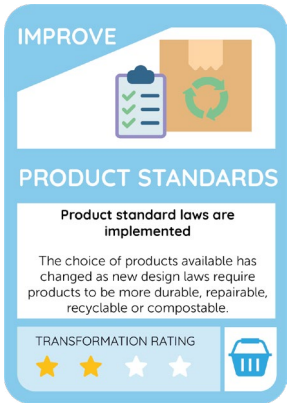
Responses to carbon budgets were mixed. The concept was not seen as very feasible by some. People tended to find the idea fascinating but not realistic in the way it could be implemented.

Product standards



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Lifetime guarantees

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Improving product standards and providing lifetime guarantees were viewed positively and prompted discussions about current products being of a low quality and designed to be replaced frequently. However, there was also a lot of distrust in businesses leading the way and that this would increase the cost of products. Some also raised concerns about constant technological advances providing no choice but to buy new to keep up.

Buying less as something they need to do:

"buying less definitely would be effective for me, because I do spend ridiculously silly amounts of money on stuff that I don't really need ."

(Carly, Devon)

Distrust in manufacturers:

"if products came with a lifetime guarantee and to ensure that they were all recyclable or be able to be remanufactured, that would be very attractive but I would be very surprised if they ever did, quite frankly. I can't even get my hoover at the moment and, while it's under guarantee, repaired or replaced successfully."

(Jane, Aberdeen)

+/- = mixed responses

\+ = positive responses

– = negative responses

Conclusions for public acceptance

Public acceptance of new ways of purchasing products is likely to shift and change over time, as new business models are still being developed and offered to people. There is currently a significant lack of awareness and familiarity with business models along circular economy principles (e.g. sharing economy, paying for services). Nonetheless, people are likely to be open to new business models, such as second-hand buying or renting, as well as strategies such as buying less or making more informed choices aided by carbon labels and price signals. This is, in part, because people recognise the influence of current consumer culture, which encourages the frequent buying and throwing away of products. Related to this, public acceptance of improved product standards and lifetime guarantees is likely to be high because people want to own more durable products, and people want manufacturers and businesses to take a share of the responsibility for reducing carbon emissions. However, public confidence in the feasibility of these strategies is currently low: there is little trust that without strong regulation and enforcement businesses would actually improve, repair or recycle products.

Many of the strategies are relatively novel (e.g. sharing economy) or not yet mainstream (e.g. second-hand purchasing) in the UK. As such, people try and make sense of these ideas by drawing on current experiences (e.g. lending garden tools from friends and neighbours). This can be positive, for example reflecting on how informal sharing initiatives increase community feeling, or negative, for example reflecting on the increasing number and cost of subscription-based services (i.e. not owning something can add up as being more expensive). Understanding how people's perceptions of new business models are affected by existing experiences- and how concerns associated with these, especially around cost and responsibility, can be addressed- will be an important aspect of ensuring public confidence and acceptance in the future.

HOW WE TRAVEL

Surface and air travel account for 30% of the UK's greenhouse gas emissions overall, and around 27% of personal carbon footprints [18]. Carbon emissions arise because 93% of distances for short journeys are travelled by car and 85% of longer journeys are made by plane [19]. Air travel is, however, quite unevenly distributed, with 15% of people responsible for 70% of all flights and half of the UK population not flying at all [20]. Options to decarbonise the sector include shifting to low-carbon modes of travel, improving existing travel modes or avoiding travel altogether [21]. The co-benefits of reducing carbon emissions from travel include reduced air pollution, improved health outcomes, as well as reduced road deaths [19]. Below we first present options to reduce carbon emissions associated with land/short-distance travel, followed by options to reduce emissions associated with flying/long-distance travel.

SHORT-DISTANCE TRAVEL

Living car free

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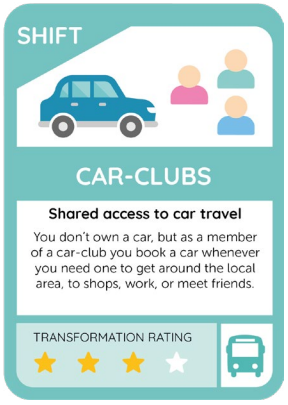
Living car free was disliked by many who also project this across society, believing that many would just be unwilling to contemplate this regardless of alternative options. Owning a car was seen as important for freedom, flexibility and travel for emergencies.

Car-clubs



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Car clubs were viewed positively however, in practice, it is not a strategy that was engaged with much because owning a car was still considered the predominant way future travel would occur.

Public transport

Active travel

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Reducing car use by increasing active travel and using public transport was viewed favourably and something that people would want to do more of, in part, due to potential health and financial co-benefits. People, however, also felt restricted by personal circumstances, such as work constraints, family responsibilities, and health conditions, which made these less viable options. In rural areas, people discussed a lack of services and investment which made these options unavailable regardless of preference.

Living car free as not possible:

"I have to get to work and drop three kids at school by 8:30 in the morning. I couldn't do that on a bus... timewise."

(Christine, Aberdeen)

Public transport means less freedom and flexibility:

"Personally, out of everything we've talked about, in terms of like food and holidays and everything, I'd find giving my car up the hardest out of them all purely because it's just the flexibility of a car, I know obviously pre-COVID, I can jump in the car and get to my friends within five minutes, so I don't have to rely on lifts or anything like that. So the flexibility and the freedom of having my car, I'd find that the hardest to give up over different meats or holidays abroad or anything like that. "

(Joey, Manchester)

+/- = mixed responses + = positive responses − = negative responses

[2] *This figure includes emissions associated with production only, and not emissions from product use.*
[3] *It should be noted that the workshops were done during the second Covid-19 lockdown where concerns about cleanliness could have been higher than normal.*

Travel less every day

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Reducing car travel by simply travelling less was seen as a possible and positive option, although within limits. Some car use was considered unavoidable (similar to living car free).

Travel shorter distances

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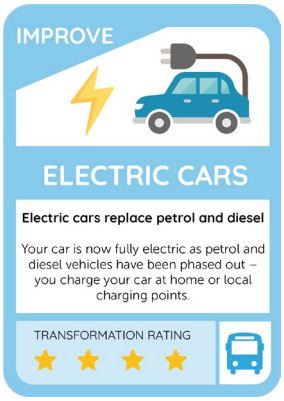
Travelling shorter distances was the least popular option. It was not considered viable, given the demands of everyday life where work, education and access to service are spread across a large geographic area.

Downsizing cars

+

Downsizing cars was perceived as something that is possible for most people, with some reflections on how many people have unnecessarily large cars.

Electric cars



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Electric cars were viewed as an obvious strategy to pursue and therefore a desirable option for many, partially because it allowed people to retain the freedom, flexibility and security they associate with individualised transport. It was seen as an essential part of a decarbonised future, but currently too expensive to be a viable choice for many.

Moving house to reduce travel distance as unworkable:

"you can't expect somebody to sell their house to move to a school that maybe children are only for five or seven years. And then move again because they go to a different high school that's maybe in a different area. Um or move closer to your job, where there's no job for life these days"

(Monica, Aberdeen)

Willing to downsize cars:

"I've got two cars, both of them are like 4x4's. I wouldn't mind, about maybe downsizing and getting a littler car, because I think the way the world's going in future that we're probably all gonna be doing less travel."

+/- = mixed responses

\+ = positive responses

– = negative responses

LONG-DISTANCE TRAVEL[4]

Staycations

+

Staycations were viewed as something that was both achievable and beneficial, specifically in light of COVID-19 and the beauty of the UK countryside, while better weather was often a reason to travel abroad. Costs of staycations compared to cheap foreign holidays was considered an issue.

Reduced air travel

+/-

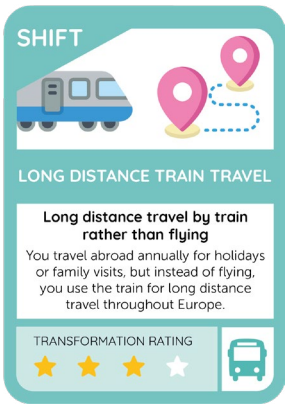
Reducing air travel by reducing the distance and number of flights was perceived as possible. However, no air travel at all was considered too restrictive. Travel abroad was considered important for experiencing culture and maintaining wellbeing. Some people had started questioning how much they fly, evidencing a possible shift in norms around flying.

Frequent flyer tax

+/-

A frequent flyer tax received a mixed response with some feeling strongly that taxing flights is unfair, whilst others felt it would be fair that those who fly regularly also pay more. There were also mixed views on effectiveness, with some convinced it would make people and businesses think more carefully about whether flights were necessary, whilst others thought that people would just keep flying regardless. The latter view was mostly expressed by higher income groups.

Long-distance train travel



+/-

Long-distance rail travel was not currently considered a viable option for many, due to longer travel times, costs, not being family-friendly and a lack of accessibility to certain destinations.

Willing to reduce flights:

"I do potentially two or three flights a year and I could reduce that to maybe one flight a year and a staycation. So I could, you know, try to stay a bit more close to home."

(Harriet, Aberdeen)

Frequently flyer tax may be ineffective:

"And if you've got to fly, you've got to fly. You've got to work to fly, or if you've got a place abroad, you're not gonna buy it and not go to it. you're not gonna be put off."

+/- = mixed responses + = positive responses – = negative responses

[4] *Note: Technologies such as solar planes were not included as currently it is uncertain whether these technologies will be ready in time and because they could be seen as a 'magic bullet' that could be a preferred choice at the expense of considering more viable options.*

Conclusions for public acceptance

Reducing car use was generally perceived positively, and alternatives such as active travel and public transport already enjoy relatively high levels of public acceptance. Many felt that they were already trying to use alternatives as much as possible, but any further action did not feel possible due to a lack of infrastructure and the resulting high levels of inconvenience. This makes it a tricky area of lifestyle change without further investment to improve infrastructure and accessibility of alternative modes of transport.

People also struggled to imagine a future where car ownership is not a dominant approach to travel. Electric cars are therefore considered essential and enjoying a high level of acceptance already (albeit being unaffordable for most). Smaller cars are also seen as a viable – and more affordable – option. Having access to a car, even if most travel is done by other modes, may be an important condition for public acceptance of alternative low-carbon mobility futures. People will have to be convinced that public transport or other forms of travel can provide the same level of freedom, flexibility and security associated with car ownership. At the moment, this is still a long way off.

Reducing air travel is likely to be challenging, because travelling abroad is seen as important for wellbeing and cultural exchange. Reducing air travel, and alternatives like staycations, are however perceived positively and viewed as a possibility that people are already exploring (with some exceptions), especially during travel restrictions from the Covid-19 pandemic. Not enabling people to travel abroad is however considered too restrictive and likely to meet with public resistance. Currently, people struggle to imagine a life without air travel, especially for those that can afford it.

CONCLUSIONS ACROSS ALL AREAS OF LIFESTYLE CHANGE

Public acceptance is contingent on additional investment and support from other societal actors

Many low-carbon strategies were considered acceptable and desirable, but there are conditions attached to this acceptance with questions about who should pay and be held responsible for making changes happen, and how changes are fairly implemented. Additional support was expected from government and business in the form of financial incentives, regulation, leadership and infrastructure development. Public acceptance of these options is more likely to translate into action if government and business support is perceived to be forthcoming. This was particularly noticeable for strategies such as installing low-carbon heating, improving building and product standards, or alternatives to petrol car use.

Personal choices and freedoms are important, but people are willing to engage in low-carbon lifestyles

Personal choice and freedoms are important aspects underpinning public preferences. In many cases people preferred options that made environmental choices easier rather than restricting choice. Strong negative reactions were only noticeable for strategies which were perceived to take away choice completely, such as meat-free diets, no access to individual car ownership, or living in smaller homes. While these more 'radical' strategies do not enjoy high public acceptance, people are willing to consider the principles that underpin them, especially if supported by other actors. For example, most participants were unwilling to consider becoming vegetarian or vegan, but were willing to consider how they could reduce their meat intake. Similarly, living car free was not considered acceptable or feasible by most participants, however they did want to reduce their dependence on cars generally and were open to other modes of transport.

The importance of cultural meanings, identity and implicit social contracts explains rejection of more radical low-carbon strategies

In addition to being viewed as too restrictive and taking away freedom of choice (see previous point), the more radical low-carbon strategies (meat-free diets, no flying, living car free, smaller homes) were also perceived to take away something important to people's expressions of culture or identity. Similarly, being able to live in big houses or enjoy foreign holidays was considered important for a good quality of life and a fair return for working hard. As a result they were seen as important parts of a social contract that people were not willing, at the time of the workshops, to renegotiate.

Education and information provision is viewed as important for informing people's choices

Participants felt that there was a need to inform people's choices better and that if information provision around carbon emissions was more widely available then people would be able to make better choices. This was evident in the positive evaluation of carbon labelling, and in some cases signalling through carbon taxes (e.g. on food, products and flights), although the latter received mixed views in terms of perceived effectiveness. Some thought carbon taxes would inform people's choices whereas others thought it would not make a difference, especially for those that could afford to pay extra. This also raised issues around fairness, with some considering carbon taxes unfair on lower-income groups.

There is a lack of awareness of the extent to which changes need to occur to meet carbon targets

There was a general lack of understanding of how much change is needed, in everyone's lifestyles, for net zero targets to be met. Participants discussed how they are already engaging in relevant low-carbon behaviours prompted by the lifestyle cards. Participants discussed reducing their meat consumption, using second hand products or using public transport. In many cases these represent occasional changes to their normal choices rather than a sustained or habitual change. In some cases, participants used these examples as a justification that people were already trying to do their bit and therefore more restrictive strategies were not necessary or acceptable.

RECOMMENDATIONS

People are willing to engage in low-carbon lifestyle change and many are open to try the strategies presented to them. However, there are a number of challenges to be overcome before this willingness can turn into widespread action to reach net zero. The below recommendations provide a framework for enabling the meaningful uptake of low-carbon lifestyles:

- **Provide clear and consistent information about low-carbon choices and the need for change.** This should include information on the extent to which different behaviours and choices are low-carbon (e.g. through labelling of products and purchases), but also focus on increasing awareness of the extent of change needed to reach net zero (e.g. need to phase out gas central heating, need to reduce waste etc.). Multiple communication channels that provide a consistent message are likely to be most effective.

- **Use existing lifestyle choices as reference points for further changes.** People tend to be more favourable about strategies they are familiar with, already engage in or can link to behaviours they aspire to for improving their quality of life (e.g. eating more healthily, being more active, reducing spending on 'stuff'). Decision-makers should present new low carbon strategies as extensions of what people are already doing, or as a way to enable what they aspire to be doing (e.g., enabling active travel for commuting, making healthier food choices).

- **Set a positive vision for net zero futures with clear examples of low-carbon living that people can support.** In many instances, people could think of examples where low-carbon strategies were already being trialled or implemented (e.g. sharing products in neighbourhood groups, long-distance train travel), but struggled to see how these could be scaled up and become mainstream. Additional support and encouragement are needed to provide people with the ability and assurance that a low-carbon lifestyle change is possible, supported and aspirational.

- **Governments and businesses need to invest in infrastructure to make low-carbon lifestyles more accessible, convenient, and financially viable for the majority** (e.g., public transport infrastructure, regulation to improve product quality and longevity, financial incentives for building improvements). This will be vital for harnessing existing public support for low-carbon lifestyle change, but also improve people's ability to turn this willingness into action. People also expect government and businesses to do more than they are currently doing.

- **Radical policies are possible and could be desirable, but people require a feeling of fairness and financial support to engage with them.** Presumed public rejection of more radical lifestyle changes (e.g. no flying, no access to cars) should not be used as an excuse to do nothing. People are supportive of many low-carbon strategies that alter the available choices, especially if this is coupled with additional support that makes these choices more convenient and financially accessible. Approaches that restrict or alter people's choices are unlikely to be wholly rejected if done fairly and if they maintain some level of choice.

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Suggested citation: Demski, C., Cherry, C., Verfuerth, C. (2022). The road to net zero: UK public preferences for low-carbon lifestyles. CAST Briefing Paper 14.

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