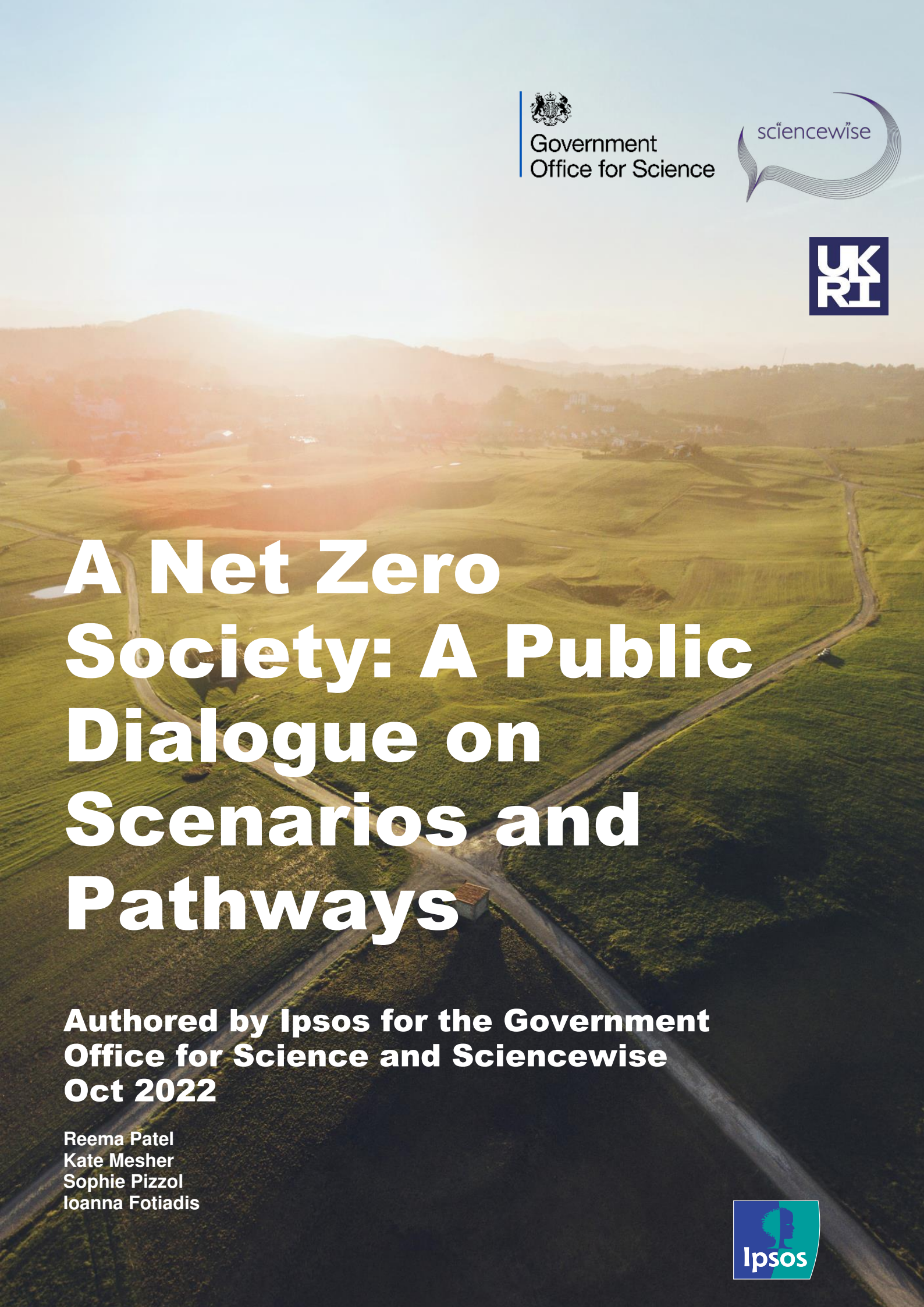


Government Office for Science

sciencewise

UKRI

A Net Zero Society: A Public Dialogue on Scenarios and Pathways

Authored by Ipsos for the Government Office for Science and Sciencewise
Oct 2022

Reema Patel
Kate Mesher
Sophie Pizzol
Ioanna Fotiadis

Ipsos

Contents

1 Executive Summary

1.1 Overview

Aim

The overall aim of this public dialogue, commissioned by the Government Office for Science (GO-Science), and supported by UKRI's Sciencewise programme[1], was to explore public attitudes and perspectives on four scenarios for what living in the UK society could be like in 2050 when net zero emissions targets have been met. These scenarios were developed through expert research, engagement, and quantitative modelling, and were designed to be divergent and deliberately stretching considerations of how UK society could change. This project contributes to the growing body of evidence on the UK public's attitudes to climate change, and social and behavioural changes relating to net zero.

Thirty participants (recruited to reflect the demographics, geographical location, and attitudes of the UK public) were asked to engage with these four scenarios and reflect on what it might be like for them and others living in these futures. They were also asked to consider what were the positive and challenging aspects of the scenarios as well as how plausible they found the futures depicted.

This report has been produced by Ipsos UK to document the approach and findings from this public dialogue. This deliberative dialogue was carried out as part of a wider project led by GO-Science: *Net Zero Society: Scenarios and Pathways*. For more information on this GO-Science project, including how the scenarios were developed and the wider conclusions of the work, please see this report.

Objectives

The objectives of this public dialogue were:

- To bring together a diverse and broadly reflective group of the UK public to engage with the developed scenarios.
- To enable participants to explore and interrogate the scenarios, so that they could reflect and deliberate on their potential implications and outcomes across different societal groups.
- To explore participants':
  - attitudes towards the four scenarios and the underlying values/principles that influenced them,
  - opinions on the most positive and the most challenging aspects of the scenarios,
  - stance on the plausibility of the four scenarios,
  - thoughts on the societal changes that could set the UK on a path to the scenarios, and
  - reflections on the tensions and trade-offs that they could identify in the scenarios.

The dialogue used a range of creative materials to elicit views and values on a range of futures. As such, this dialogue did not directly seek to understand participant views on net zero or climate change in

[1] www.sciencewise.org.uk

general but sought to create and understand the public's reactions to the different societies outlined in the four scenarios.

1.2 Introduction to Scenarios

In this section we provide a summary of each scenario. This is followed by the general reflections that participants had on each scenario. For more information on the scenarios and how they were developed, please read the GO-Science report, which can be found here.

Scenario 1

Overview of scenario:

- **The built environment**: Many people live in cities and those in rural areas feel neglected. Funding is channelled to urban areas. There is compact living in small households. There is a push for essential services close to home.
- **Food and land use**: Increase in plant-based diets and synthetic or cultured meat. Organically farmed meat is a rare luxury. Genome editing and robotics have reduced land and pesticide use. There is improved food self-sufficiency.
- **Work and industry**: There is a thriving competition based on a free market and a growing circular economy. There is a growing focus on sustainability and technology assists people in making sustainable choices.
- **Travel and transport**: Connected and autonomous vehicles (CAVs) are available as on-demand shared travel. There are zero carbon international flights but less domestic flying. There has been greater investment in low-cost urban public transport and train travel cheaper and easier between cities.

Scenario 2

Overview of scenario:

- **The built environment**: Less investment in cities has driven people out to the suburbs and rural areas. Housing demand outstrips supply and there is more multigenerational living. There is also a focus on 'self-sufficient' living.
- **Food and land use:** Meat is readily available through intensive farming. Organic options are available but are unaffordable for most people. Some UK farmland has become unviable meaning there is an increased reliance on imported food. There is little advanced agricultural technology available.
- **Work and industry**: There is increased domestic competition and some reshoring. Many goods are still designed with inbuilt obsolescence and 'greenwashing' by companies is common. In general, there is a throwaway culture. However, those living 'off grid' have a 'make do and mend' attitude. There are also service exchange or mutual goods exchange systems.
- **Travel and transport**: Connected Autonomous Vehicles (CAVs) are available for the rich. Public transport is available but is fragmented outside of cities and has received little investment. There has been moderate investment in active travel infrastructure. Flying is increasingly expensive.

Scenario 3

Overview of scenario:

- **The built environment**: People are increasingly living in self-contained 'bubbles' in suburban and rural areas. More people live alone. Dispersed new homes improve affordability. However, there is a reduced sense of community and there are fewer local amenities available.
- **Food and land use:** There is an increase in the availability and affordability of synthetic meat. Urban agriculture and vertical farming offer local produce for those with higher incomes. Gene edited crops and robotic pollination have allowed the UK to maintain self-sufficiency. However, environmental degradation has reduced biodiversity.
- **Work and industry**: There is international competition and increased reshoring. High consumption and increased technological obsolescence create a throwaway culture. However, there are also better recycling solutions. Cryptocurrency is increasingly used to purchase services in both the physical and virtual world.
- **Travel and transport**: There is a strong uptake of CAVs by those with higher incomes. Long distance public transport has received increased investment and has improved substantially. However, the cost of public transport has excluded some of those with lower incomes. International flights for holidays and leisure remain popular.

Scenario 4

Overview of scenario:

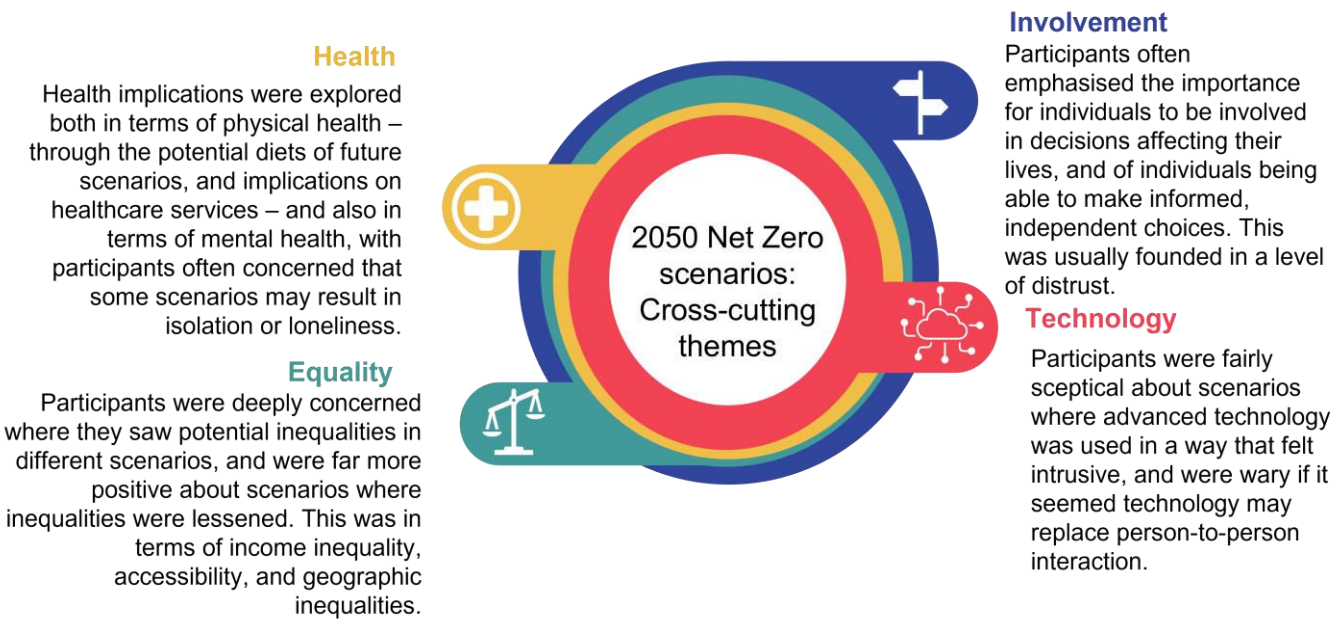
- **The built environment**: Population is spread across urban and rural areas. There has been low investment in new homes. People are living more localised and compact lifestyles and relying on increased local amenities.
- **Food and land use:** There is an increase in plant-based diets and lower meat consumption. Little agricultural technology is available. More food is grown in the UK for domestic consumption. There are protected nature zones and restored national parks.
- **Work and industry**: Smaller businesses are thriving and benefiting from localisation. Big businesses are promoting positive societal values to attract customers. There is an increased in shared goods and services. The cost of goods is high and there is an increase in repairing rather than replacing items.
- **Travel and transport**: Private car ownership is less frequent and there are few CAVs in use. Walking and cycling are common, and people can access an efficient and well-maintained public transport system. Flying domestically or internationally is rare with more options for slower and less emissions-intensive options (such as high-speed trains or boats).

1.3 Key Findings

Overall, participants were worried about climate change and the risks it posed to current and future ways of life. The majority of participants indicated through baseline and post-deliberation polling that they were

either slightly or very concerned about climate change. This reflects existing Ipsos polling of the wider UK public's views.

The dialogue uncovered a range of cross cutting themes:



1. **Technology:** Participants expressed nuanced views on the role of technology in the future. Looking ahead to 2050, participants recognised that significant technological innovation was expected, but also expressed certain conditions for those innovations to be acceptable. Many participants expressed concern about relying disproportionately on technology to reduce emissions and were highly critical of technologies they saw as automating jobs or contributing to an increased sense of social isolation. Others were sceptical of the role technologies (particularly those relating to electrification and decarbonisation) could feasibly play in emissions reductions. Participants typically exhibited low levels of trust in the agenda and priorities of large technology companies and were also concerned about the social and economic implications of future technological innovations. They questioned whether technology would be affordable for all and if some technologies could reduce social contact between different groups. However, they also saw some benefits, relating to potential positive health outcomes and convenience, that could arise through the effective use of technologies.

2. **Equality:** Participants were concerned about future societies' potential impacts on equality. As a consequence, they felt that fairness and equality should be a priority, and that no individual should be left behind when making progress on reducing emissions. Specifically, participants were most concerned about impacts on income inequality, place-based inequality (between rural and urban locations), health inequalities (such as accessibility considerations), and intergenerational inequalities.

3. **Health:** Participants were concerned about whether changes in future society (for example, in how food is produced or in how people socialise) would disproportionately impact mental and physical health. They advocated for maximising both climate and health benefits and were averse to any progress made in one at the expense of the other.

4. **Involvement:** Participants advocated for informed individual and collective involvement over future changes to how people live their lives. They supported an approach to societal change that was consultative and collaborative, working with diverse stakeholders and perspectives. Trustworthiness, and trust in the institutions responsible for guiding the UK towards lower emissions, was a key theme. Participants noted that trust and confidence in organisations such as government agencies, political parties, and commercial organisations (particularly technology companies) would be an important factor in how people interact with these organisations in the future. They also expressed preference for consultations and decisions being made locally, given the differing experiences and expectations of communities across the UK.

Other key findings included:

5. **Balance between circular economy and innovation:** Participants embraced the aspects of the scenarios that reflected a 'circular economy' such as 'repair, reuse and recycle' elements, valuing a thoughtful and responsible approach to consumption. However, they also indicated that they expected continued innovation and growth. They expressed preference for a balanced approach that maintained consumer choice while also improving sustainability.

6. **Balance between sustainability and lifestyle choices:** The possible trade-off between reducing emissions and maintaining people's lifestyles was highlighted by participants. Concerns centred on impacts on convenience and choice, on jobs (particularly around automation of roles or some reduced job opportunities in some industries), and on health (both mental and physical). In terms of specific societal changes represented in the scenarios, some of the most contentious related to approaches to reducing meat consumption, particularly where that involved relying on novel technologies (such as cultured meat) and a departure from what they perceived to be 'natural' sources of food. Some participants also reacted negatively to reductions in car use and aviation with many highlighting that some individuals may need to maintain current levels of road/air travel (for example, those living in remote or rural communities and those with family in other countries).

2 Introduction

2.1 The wider context of climate change

Climate change has, and will continue to have, significant impacts on the economies, societies, and environments of every nation. To curb some of these impacts, the international Paris Agreement commits to limiting global temperature rise to within 1.5ºC above pre-industrial levels with related specific obligations for individual countries.[2] An independent research institute, the Centre for Climate Change and Social Transformations (CAST), has found that 28% of global emissions are directly attributable to industry and agriculture.[3] However, the vast majority (72%) of global emissions are produced by individuals: these emissions are influenced by what people eat, how they travel, how much energy they use at home and how this energy is produced, what products they use and how they dispose of them, and other factors such as their travel behaviours.

In May 2019, the Climate Change Committee (CCC) recommended that the UK Government should set the target to reduce greenhouse gas emissions (GHGs) to 'net zero' by 2050 to meet the country's obligations set under the 2015 Paris Agreement.[4] In July 2019, the government amended the Climate Change Act (originally passed in 2008) to commit the UK to this target.[5] Subsequently, the Department for Business, Energy and Industrial Strategy (BEIS) published the government's Net Zero Strategy, which laid out plans for how to reach net zero by 2050 and emphasised that this would require far-reaching changes across all sectors of society.[6]

2.2 Introduction to the project context

As part of their Net Zero Society Foresight project, the Government Office for Science (GO-Science), working with Ipsos, created four scenarios for what UK society could be like in 2050. The aim of the Foresight project is to qualitatively and quantitatively explore how society may develop by 2050, based on established futures thinking methodologies. These scenarios were designed to be divergent and deliberately stretching considerations of how UK society could change on its path to reaching net zero.

To understand public attitudes and perspectives on these scenarios, GO-Science commissioned Ipsos to deliver a public dialogue. The public dialogue was supported by UK Research and Innovation's Sciencewise programme which helps to ensure policy and research is informed by the views and aspirations of the public. In addition to the specific objectives of the project, GO-Science wished to understand more about the role public dialogue might play in other foresight and futures work – for example, through evaluation by Sciencewise into the effectiveness of the public dialogue process and impact. This project contributes to the growing body of evidence on the UK public's attitudes to climate change, and specifically, towards views on social and behavioural changes as they relate to reducing

[2] https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement

[3] https://www.ipsos.com/sites/default/files/ct/publication/documents/2022-06/net-zero-living-ipsos-cast-2022.pdf

[4] https://www.theccc.org.uk/wp-content/uploads/2019/05/Net-Zero-The-UKs-contribution-to-stopping-global-warming.pdf

[5] https://www.legislation.gov.uk/ukdsi/2019/9780111187654

[6] https://www.gov.uk/government/publications/net-zero-strategy

carbon emissions and realising net zero. The broader evidence base on these issues includes Climate Assembly UK, which deliberated on pathways to net zero, as well as wider research undertaken by Lancaster University and CAST.[7,8]

2.3 How to use this report

This report presents the approach used to engage members of the public in discussing the four net zero scenarios. It summarises the four scenarios and presents participants' initial reflections and overall views on the scenarios and the cross-cutting themes on which discussions focussed. The perceived plausibility of the scenarios and participants' suggestions for the changes that could lead to the four scenarios follows. Finally, there is a deep dive into the participant views on each sector they were asked to consider (the built environment, travel and transport, work and industry, food and land use, and civic life).

Table 2.1: Pages references for different audiences and interests

What are you looking for?	Page Number
If you are a public dialogue practitioner, researcher, or policymaker seeking to understand more about the process and approach to the public dialogue	**14**
If you are a policymaker, researcher, or academic, seeking to understand participants' **overall** views on the net zero scenarios they engaged with, what tensions they identified and the changes they identified that could lead to different scenarios	**19**
If you are a policymaker, researcher, or academic interested in public views relating to specific sectors, go to:	
The Built Environment *Relating to how people and where people live as well as the sorts of buildings they live in, work in, and travel between.*	**34**
Travel and Transport *Relating to how and where people travel.*	**41**
Work and industry *How these scenarios create jobs, develop skills, and develop economies.*	**46**
Food and Land Use	**55**

[7] https://www.climateassembly.uk/

[8] https://climatecitizens.org.uk/

What people eat, how people eat it, and how the food is made and gets to citizens' plates.	
Civic Life *Relating to how citizens can engage with politics and community in each scenario, quality of debate, involvement in community groups, charities and social enterprises.*	**64**

3 Approach

3.1 Dialogue aims

GO-Science, with support from UKRI's Sciencewise programme, commissioned Ipsos to carry out a public dialogue. Public dialogue enables constructive conversations amongst diverse groups of citizens on topics which are often complex or controversial. It provides in-depth insight into public opinion and also offers a window to understanding people's reasoning. Usually, public dialogues enable the public to interact with scientists, stakeholders, and policymakers as part of the process.[9] In delivering this public dialogue, participants took part in a webinar and a series of five deliberative online workshops.

In this futures-focused dialogue the scenarios and supporting materials were used to do the following:

- To bring together a diverse and broadly reflective group of the UK public to engage with the developed scenarios.
- To enable participants to explore and interrogate the scenarios, so that they could reflect and deliberate on their potential implications and outcomes across different societal groups.
- To explore participants'
  - attitudes towards the four scenarios and the underlying values/principles that influenced them,
  - opinions on the most positive and the most challenging aspects of the scenarios,
  - stance on the plausibility of the four scenarios,
  - thoughts on the societal changes that could set the UK on a path to the scenarios, and
  - reflections on the tensions and trade-offs that they could identify in the scenarios.

3.2 Participants

Ipsos recruited 30 people from across the UK (**Figure 1**) to take part in this public dialogue. We sought to create a mini public that was broadly reflective of UK population demographics (including age, income level, geographical location, ethnicity, and gender). For participant quotas for each demographic factor, see **Annex A**. Ipsos also ensured a range of attitudinal differences were included in the participant sample, specifically with regards to levels of concern about climate change and views on the government's role in shaping the economy and society[10]. We used a purposive approach to recruitment, to ensure underrepresented communities were adequately represented, agreeing minimum quotas for their recruitment. These underrepresented communities were individuals from minority ethnic

[9] https://sciencewise.org.uk/about-sciencewise/our-guiding-principles/

[10] Data from Ipsos UK and other polling indicates that the majority of the UK public are worried about climate change, and think drastic action is needed to mitigate its impacts. We sampled based on roughly 80% (24-6) participants being concerned, and the remaining 20% (3-6) being not very or not at all concerned. Data sources were:
https://www.ons.gov.uk/peoplepopulationandcommunity/wellbeing/articles/threequartersofadultsingreatbritainworryaboutclimatechange/2021-11-05#:~:text=These%20findings%20for%20Great%20Britain,some%20degree%20about%20climate%20change.
And: https://www.ipsos.com/sites/default/files/ct/news/documents/2022-04/Ipsos%20-%20Global%20Advisor%20-%20Earth%20Day%202022%20-%20Release%201.pdf
We used a statement to recruit for participants with varied views on the extent to which the government should play an active role in shaping economy and society – the full statement and breakdown of participant views for this can be found in the Annex.

backgrounds, those with English as an additional language, and people on lower incomes. It was critical to include people from these groups in the dialogue because evidence shows that climate change disproportionately impacts people with lower incomes and those from minority ethnic backgrounds.[11]

Participants were paid £60 per workshop for their participation in the five online evening workshops, and £40 to participate in the shorter online webinar. One participant had to drop out of the dialogue due to unforeseen life circumstances. Another two participants had to miss a single workshop but were able to catch up on the content of the missed workshop and, therefore, this did not affect their engagement in the workshops that they were able to attend.

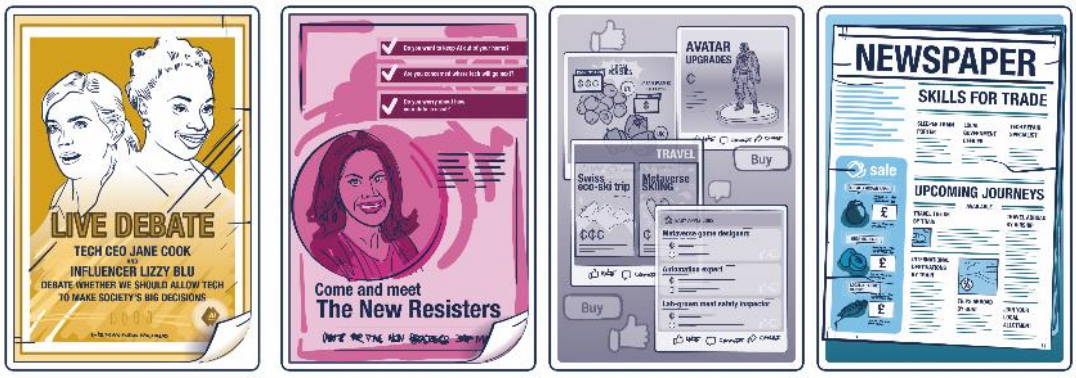
Figure 3.1: Geography of each participant

3.3 Dialogue Materials

To assist in conveying the four scenarios to participants, Ipsos developed some immersive materials. Firstly, rich picture illustrations were created to provide a snapshot of how life might look in 2050 (see **Annex B** for these illustrations). To complement these rich pictures, two 'future artefacts' were created for each scenario. Future artefacts are materials that reflect the culture and daily life of an imagined future (see **Annex B** for the full set of artefacts used). Participants received these printed futures artefacts through the post and were asked to engage with them during the workshops. They were used in workshops to help with discussions, providing examples of jobs, products that people could buy, and contemporary issues in the future scenarios.

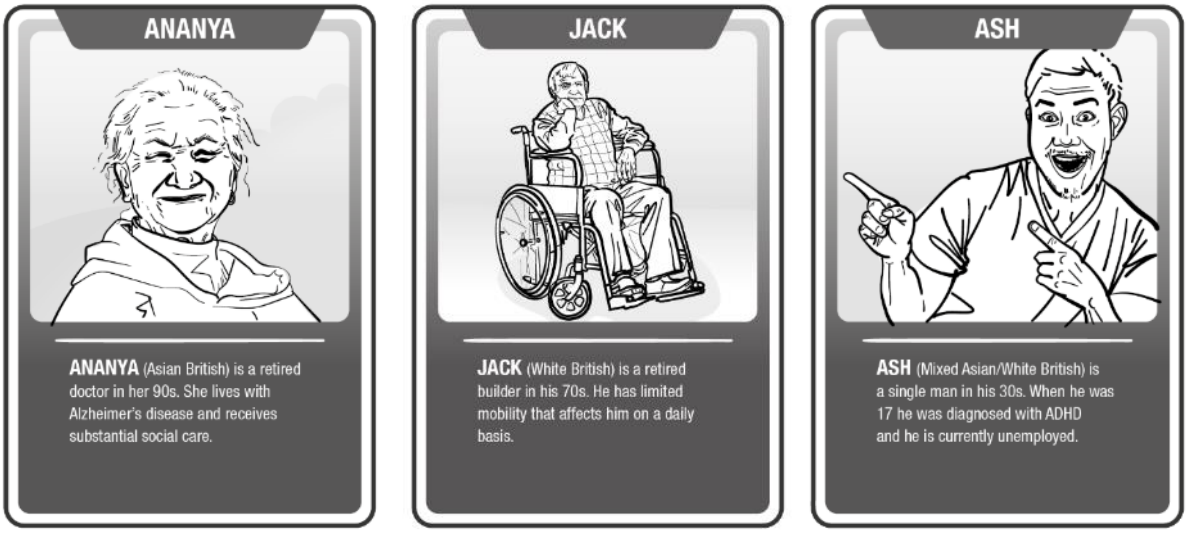
[11] https://psci.princeton.edu/tips/2020/8/15/racial-disparities-and-climate-change

Figure 3.2: Example future artefacts developed for the four scenarios



To help participants view the scenarios through the perspectives of different groups, a set of 'personas' were developed. Personas are characters developed to represent a particular group. Ipsos used personas to help represent groups whose perspectives and lived experiences have often been underrepresented in social discourse, or whose lived experience would require greater consideration in policy and future infrastructure design (for example, people with disabilities, individuals from minority ethnic groups, older people, and those with lower incomes). The personas were therefore developed to enable participants to explore boundaries of the scenarios that were not directly applicable to their own lives. See **Annex B** for the full set of personas developed. These persona cards were printed and posted to the participants with the futures artefacts above.

Figure 3.3: Example personas developed for the dialogue



3.4 Dialogue Structure

We initially introduced participants to the process as well as the issues pertinent to the scenarios through a short webinar. Following the webinar, participants contributed towards four three-hour online workshops (workshops 1–4) that each considered an individual scenario. The dialogue concluded with a review and consideration of all the scenarios in a final three-hour online workshop (workshop 5). These sessions took place over all stages of engagement on Monday and Wednesday evenings.

Webinar

In the first session (an interactive webinar), the participants were introduced to core concepts, such as climate change, the global net zero target, the UK government's emissions targets, and the different

ways emissions can be reduced. The webinar was framed around the 'here and now' and was intended for participants to develop a baseline understanding of what the objective of the dialogue process was, taking this with them as they were transported to the four future scenarios. It also provided an opportunity for participants to familiarise themselves with the online platform being used, ask any questions about the process or the context, and interact with each other for the first time.

Scenario workshops (workshops 1– 4)

Participants took part in four three-hour online workshops, each focused on a different scenario. These scenarios were labelled numerically and were branded in different colours to help participants distinguish between them. Each workshop began with a short introduction from the chair. Participants were shown a rich picture illustration for the scenario they were being asked to consider and the facilitator read out a short narrative to help them imagine what society in that future might be like.

Participants were then moved into breakout rooms. The participants were asked to imagine themselves in this world as they are now. The facilitator used discussion guides (**Annex C**) to move participants through the different aspects of the future society (the built environment, food and land use, work and industry, and travel and transport) with the assistance of a slide of images to prompt participants' imaginations (see **Annex B**). Facilitators also directed participants to the futures artefacts and the personas to elicit considerations of different perspectives and aspects of the scenario. The composition of the breakout groups was changed for each workshop so that participants experienced different interactions each time, creating different directions for discussion. The sequence in which sectors were considered by each breakout group also varied to ensure a diversity in discussion, as well as to address the risk of order effects (the risk that the order in which topics were considered would influence the way respondents may discuss them).

Initially, the order scenarios were introduced to participants was randomised. Following workshop 2, however, the project team decided to discuss scenario 4 in workshop 3, and scenario 3 in workshop 4, to benefit the overall flow of the workshops. When discussed in this report, the scenarios are titled with their affixed numbers, rather than the order they were introduced to participants.

Cross-scenario workshop (workshop 5)

In the final workshop, participants were welcomed by the chair and thanked for their contributions and engagement. They were reminded of each of the scenarios that they had been immersed in over the previous four workshops. They were also shown some graphics outlining the implications of the different scenarios for the energy infrastructure required, the cost to citizens and the risk of external events affecting emissions levels. After this, they were moved into breakout groups as in previous workshops and asked to reflect on all four scenarios, with a focus on how plausible they seemed, the tensions and trade-offs they could identify, and the societal changes that could happen that would set the UK on the pathway to any of the scenarios. Finally, participants were brought together and the facilitators from each group reflected the key messages their groups had raised.

3.5 Analysis

Every breakout room had a trained notetaker who transcribed the sessions.

Ipsos developed a coding framework based on the discussion guides used in the workshops, which was tested against emerging findings from early workshops. Transcripts were coded using NVivo, a qualitative data analysis computer software package. These codes were thematically analysed.

For reporting findings, the conventions of qualitative social science reporting were used:

- ‘A few’ or ‘a limited number’ is used to reflect views which were mentioned infrequently, and ‘many’ or ‘most’ when views were more frequently expressed. ‘Some’ is used to reflect views which were mentioned some of the time, or occasionally.
- Typically, we cover findings that were expressed most commonly first.
- Strength of feeling is indicated (even when views were expressed by a minority) as this may also give useful insight into the range of feelings which exist within different groups of people.
- This is a report of perceptions rather than facts. It is indicated where perceptions of participants are being reported, and where analysis of the implications of these perceptions is being offered.
- Where views apply only to a subset of participants (for example, participants living in rural areas) this is highlighted.

3.6 Interpretation

The four scenarios being discussed were developed to be as divergent as possible and deliberately stretching in considering the different ways UK society could change on its path to reaching net zero. However, in their exploration of the scenarios, many participants interpreted and made assumptions about the scenarios that went were beyond what was presented. Some of the participants’ assumptions on the context and consequences of the scenarios were extreme. This report attempts to indicate where participants were considering the scenarios as presented and where they discussed more extreme assumptions that went beyond the information that they had been given.

4 Overall views

This chapter outlines participants' views on the scenarios as a whole and highlights the cross-cutting themes on which participants focused consistently. We explore their initial responses to specific scenarios before looking at issues of plausibility and the tensions participants identified during their deliberations.

4.1 Overall thoughts about the scenarios

In this section there is a short introduction to each scenario (the rich picture illustration followed by a summary of what different sectors would be like in the scenario). This is followed by the general reflections that participants had for each scenario. In exploring the scenarios, participants sometimes made assumptions and inferences about those scenarios, drawing from their everyday life and experiences. Participants did sometimes spontaneously compare between scenarios as the workshops progressed.

Scenario 1

Overview of scenario:

- **The built environment**: Many people live in cities and those in rural areas feel neglected. Funding is channelled to urban areas. There is compact living in small households. There is a push for essential services close to home.
- **Food and land use**: Increase in plant-based diets and cultured meat. Organically farmed meat is a rare luxury. Genome editing and robotics have reduced land and pesticide use. There is improved food self-sufficiency.
- **Work and industry**: There is a thriving competition based on a free market and a growing circular economy. There is a growing focus on sustainability and technology assists people in making sustainable choices.
- **Travel and transport**: Connected and autonomous vehicles (CAVs) are available as on-demand shared travel. There are zero carbon international flights but less domestic flying. There

has been greater investment in low-cost urban public transport and train travel cheaper and easier between cities.

Participant views:

Participants' initial thoughts on this scenario often revolved around **the high use of technology** in 2050. They tended to express negative feelings or wariness about the widespread use of artificial intelligence (AI) and virtual reality (VR), the use of technology in farming, and participants' concerns around how certain people – such as those living in rural communities, or older people – may feel left behind or excluded because of this heavy reliance on technology. Participants felt the scenario **presented futuristic and exciting technologies, but some participants expressed concerns with how realistic** these advancements may be. Participants also expressed concern about **the rural and urban divide.** Participants from rural areas were **worried about being 'left behind'**, with limited access to the improvements in public transport efficiencies that those in urban areas were experiencing, and with limited emphasis on their contributions to wider society (for example, through food production being divorced from rural areas.)

Scenario 2

Overview of scenario:

- **The built environment**: Less investment in cities has driven people out to the suburbs and rural areas. Housing demand outstrips supply and there is more multigenerational living. There is also a focus on 'self-sufficient' living.
- **Food and land use:** Meat is readily available through intensive farming. Organic options are available but are unaffordable for most people. Some UK farmland has become unviable meaning there is an increased reliance on imported food. There is little advanced agricultural technology available.
- **Work and industry**: There is increase domestic competition and some reshoring. Many goods are still designed with inbuilt obsolescence and 'greenwashing' by companies is common. In general, there is a throwaway culture. However, those living 'off grid' have a 'make do and mend' attitude. There are also service exchange or mutual goods exchange systems.

- **Travel and transport**: Connected Autonomous Vehicles (CAVs) are available for the rich. Public transport is available but is fragmented outside of cities and has received little investment. There has been moderate investment in active travel infrastructure. Flying is increasingly expensive.

Participant views:

Despite the relatively low use of technology in this scenario, participants were still **concerned** about **the role of AI in everyday lives in the future,** assuming that it would likely still play an active, potentially invasive role**.** However, some participants were concerned about the opposite issue: a **lack of technological development in this scenario, and in particular the lack of availability of advanced and net zero technologies**. For these participants, it felt that the scenario was 'going backwards' for society and there was no progress between the current day and 2050. This sense of going backwards was strongly held by most participants, with others saying that it felt similar or worse than society in the current day. This was most frequently highlighted in line with the **division participants were most concerned about – income equality**, which was a feature of the scenario**.** Most participants were uneasy about the 'rich getting richer' and were worried that some aspects of daily living would be unaffordable for those with lower incomes.

Scenario 3

Overview of scenario:

- **The built environment**: People are increasingly living in self-contained 'bubbles' in suburban and rural areas. More people live alone. Dispersed new homes improve affordability. However, there is a reduced sense of community and there are fewer local amenities available.

- **Food and land use:** There is an increase in the availability and affordability of synthetic meat. Urban agriculture and vertical farming offer local produce for those with higher incomes. Gene edited crops and robotic pollinations allowed UK to maintain self-sufficiency. However, environmental degradation has reduced biodiversity.

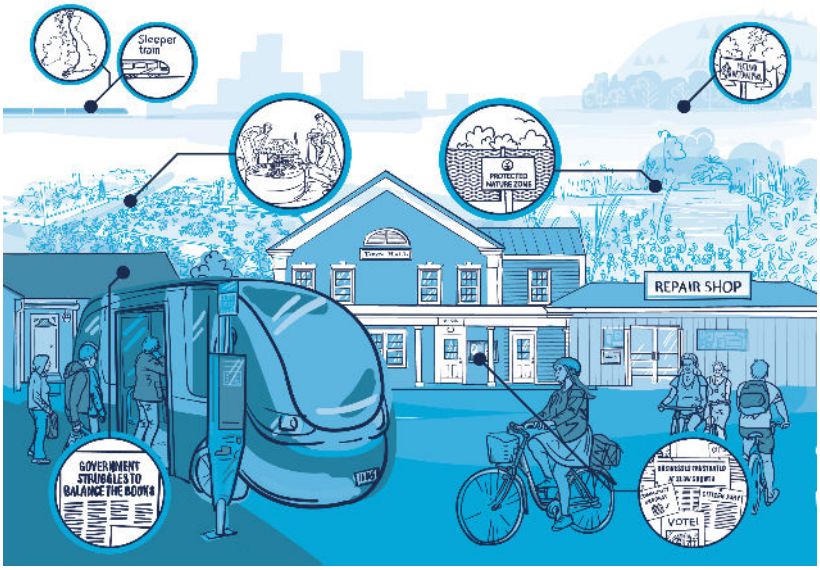
- **Work and industry**: There is international competition and increased reshoring. High consumption and increased technological obsolescence create a throwaway culture. However, there are also better recycling solutions. Cryptocurrency is increasingly used to purchase services in both the physical and virtual world.

- **Travel and transport**: There is a strong uptake of CAVs by those with higher incomes. Long distance public transport has received increased investment and has improved substantially. However, the cost of public transport has excluded some of those with lower incomes. International flights for holidays and leisure remain popular.

Participant views:

Participants' initial reactions centred on concerns around **income inequality**, as materials highlighted that this remained high in this scenario. While some did note technology could be used to achieve positive outcomes – for example, **to make healthcare more effective and efficient** – many participants expressed concerns about the frequent use of virtual reality and other immersive technologies in **contributing to the atomisation and isolation of society**. Even participants who welcomed the use of technologies for the reduction of emissions and greater convenience expressed **concerns about technology being used to displace human interaction and communities.**

Scenario 4



Overview of scenario:

- **The built environment**: Population is spread across urban and rural areas. There has been low investment in new homes. People are living more localised and compact lifestyles and relying on increased local amenities.

- **Food and land use:** There is an increase in plant-based diets and lower meat consumption. Little agricultural technology is available. More food is grown in the UK for domestic consumption. There are protected nature zones and restored national parks.

- **Work and industry**: Smaller businesses are thriving and benefiting from localisation. Big businesses are promoting positive societal values to attract customers. There is an increased in shared goods and services. The cost of goods is high and there is an increase in repairing rather than replacing items.

- **Travel and transport**: Private car ownership is less frequent and there are few CAVs in use. Walking and cycling are common, and people can access an efficient and well-maintained public

transport system. Flying domestically or internationally is rare with more options for slower and less emissions-intensive options (such as high-speed trains or boats).

Participant views:

Most participants **highlighted that the focus on communities and localised decision-making in this scenario were positives,** although a few did say that local politics may be challenging to handle, sometimes referencing their own experience with a lack of local engagement**.** The availability of **locally grown food** was also popular, as was the **extensive use of public transport, the shrinking income inequality and the 'repair and mend' culture.** Others were **worried about the slow-down in production**, and new products being less frequently available from businesses. These concerns often drew on a desire for convenience being maintained.

4.2 Cross-cutting themes

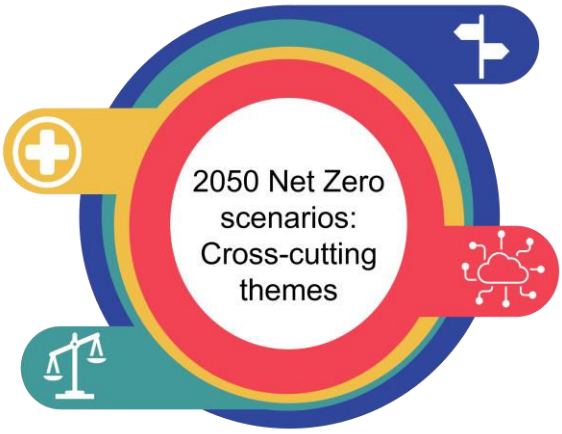
Throughout discussions, participants explored what they saw as the advantages and challenges in the four scenarios presented to them and how these could impact their lives and those of others. Over the course of the workshops, participants' discussions often revolved around four cross-cutting themes that are outlined below. These themes were often inter-related, with participants' values on one (for example, around equalities) impacting the views they expressed on the other (for example, equality of access to healthy foods).

Health

Health implications were explored both in terms of physical health – through the potential diets of future scenarios, and implications on healthcare services – and also in terms of mental health, with participants often concerned that some scenarios may result in isolation or loneliness.

Equality

Participants were deeply concerned where they saw potential inequalities in different scenarios, and were far more positive about scenarios where inequalities were lessened. This was in terms of income inequality, accessibility, and geographic inequalities.



Involvement

Participants often emphasised the importance for individuals to be involved in decisions affecting their lives, and of individuals being able to make informed, independent choices. This was usually founded in a level of distrust.

Technology

Participants were fairly sceptical about scenarios where advanced technology was used in a way that felt intrusive, and were wary if it seemed technology may replace person-to-person interaction.

4.2.1 Technology

Many participants expressed wariness of advanced technologies, how they were used and who benefitted from their use. Often, participants' concerns centred on advanced technologies, and how their use may impact people and society, rather than being concerned specifically with net zero technologies. For example, carbon capture, use and storage (CCUS) was rarely discussed, perhaps because, when it was explained to participants, they could not see how this would directly impact their lives. Instead, most participants focused on the use of AI, VR, automation, and other advanced technologies, and their specific applications. Particular focus was given to technologies used in farming and transport – again,

perhaps because participants were either more familiar with these technologies in theory, or because they could understand how the use of these technologies would directly impact them.

Across the scenarios, some aspects of technology use were seen as positive. For example, digital democracy elements were met quite positively (such as online voting or virtual debates). Technologies applied specifically in some areas were met with some enthusiasm (for example, in the transport sector there was interest in the use of CAVs and in upgrading transport infrastructure). The use of advanced technologies 'in the background', where participants would not directly engage with it but would feel their effects, was also seen as more positive, with participants noting the use of technology in healthcare to help with efficiency and reduce backlogs and errors as positives. Similarly, the less visible use of technology to facilitate a circular economy was seen by most as a positive.

> **"The use of technology in healthcare, I think there is a very big gap for that. That could be really helpful." –** *England (urban), Scenario 3*

Indeed, most participants expected some level of technological innovation by 2050. In the lower technology scenarios (scenarios 2 and 4) some participants were concerned by the lack of progress; often, this seemed to be due to an expectation that progress was a given, but for some this appeared to be founded in a desire for innovative technologies and the convenience they expected them to bring. Generally, most participants seemed to favour technological advances that created greater efficiencies and conveniences, although there were questions over how this could be achieved. A few participants did also consider how net zero technologies might function, and how realistic they were, questioning, for example, the plausibility of zero carbon flying, and of reducing emissions in scenarios with a heavy emphasis on private vehicle usage, reliance on imports, and high levels of consumption.

However, participants overall greeted greater reliance and dependency on technologies used in everyday life with wariness and a sense of distrust. Particular concerns were expressed about the use of technologies in the context of social media, as well as the deployment of AI and VR. Levels of trust varied across participants, although most erred on the side of scepticism. Some participants were sceptical about possible benefits of advances in technology if they could see a profit motive.

> **"You can't trust big tech, it's about their shareholders, not their world." –** *England (rural), Scenario 1*
> **"I'm all for technology, but is it going to start controlling everything I do?"** *– Northern Ireland (urban), Scenario 2*

When explored further, participants' overarching views on technology use were rooted in two strongly held concerns. These were consistent throughout the dialogue and rarely shifted following deliberation.

1. **Concerns about technology's impact on individuals' day to day lives**

Some participants were extremely worried by how technology could become invasive in individuals' lives, creating increasingly unequal and atomised worlds. In scenario 3, for example, participants were keenly concerned that the use of technology may result in isolation as people lived more virtual lives. Participants saw the potential for technology to lead to a greater sense of isolation and loneliness among individuals, facilitating a lack of human interaction and community, which was in opposition to the value many participants placed on community. This concern was also expressed by those who were more positive about the use of technology.

> **"As easy as it is to submerge yourself in this virtual bubble it can't replace reality and it never should."** – *England (urban), Scenario 3.*

2. **Concerns about technology's impact on society, especially marginalised groups**

More widely, participants also often highlighted a hope that the use of technology would not alienate or disempower certain groups. For example, participants were concerned automation would result in those who were already earning less losing their jobs. Participants also said they were worried about older people being unable to keep up with technological progress. Some participants expressed concern that heavy reliance on technology in all aspects of society would result in a loss of privacy and freedoms. More participants were concerned about the use of advanced technologies in food production, often expressing anxieties around a few influential companies controlling the means of producing food through genetically modified or cultured products.

> **"I think if you have new technology, it will be in the hands of very few people, and maybe that isn't such a good thing, because if you grow GM crops you have to grow GM food because it doesn't reproduce, so they are reliant on that company."** – *Northern Ireland (rural), Scenario 1*

4.2.2 Equality

Equality was one of the most consistently explored themes during the five workshops. All participants were deeply concerned by potential inequalities in the four scenarios. Participants generally felt that whichever group was less well-off – whether this was around income, or those outside population centres – were more likely to have worse physical and mental health, and to struggle to live fulfilling lives. The concerns expressed around inequality can be broadly grouped into three categories.

1. **Income inequality**

All scenarios had some stipulation for how wealth may grow or shrink by 2050. In the scenarios where there was higher income growth for the wealthier than the poorer (scenarios 1, 2 and 3), participants overwhelmingly reacted negatively to this aspect. Most participants inferred that these scenarios would involve de facto exclusion of those who were less well off from certain aspects of society: from travelling longer distances or getting around local areas efficiently (through the use of CAVs, for example), losing jobs to automation, or through having less access to what participants saw as healthier foods.

> **"People who are less well-off who would be dependent on the processed stuff, that's generally not as nutritious."** – *England (urban), Scenario 2*

There was a persistent worry that those with less money were being 'left behind' while the wealthiest were able to thrive. Participants' feelings were strongest in scenarios 2 and 3, where the differences in wealth were seen as being most pronounced and were made physical in gated communities. Participants found scenario 4 more acceptable, where income inequality showed signs of shrinking.

> **"I love the idea of getting us onto a more level playing field." –** *Scotland (rural), Scenario 4.*

2. **Place-based and geographic inequality**

Where income inequality was less stark, participants also noted a dislike for inequalities between urban and rural areas. This sentiment was expressed most strongly by those from rural areas, and was most often noted with scenario 1, which is explicit that urban areas have been developed more than rural ones. There were two reasons for the strongly negative reaction to this: those in rural areas feeling 'left behind' by the scenario, lacking access to amenities and funding being enjoyed in urban areas;

secondly, feeling those in rural areas would need to move into urban areas, resulting in a loss of access to nature or loss of their livelihoods for those working in agriculture.

> **"If [food is] grown in a lab, they won't need farmers anymore. Farmers will lose out." –** *England (urban), Scenario 1.*

3. **Accessibility**

Accessibility was something most participants were deeply concerned with. The persona Jack was often used as an example of someone who may struggle if their needs are not considered in the future due to his limited mobility. While inequality was discussed extensively, participants also explored the many opportunities for equity in scenarios. In scenarios where public transport or active travel were dominant modes of transport, participants hoped this infrastructure would be designed in a way that facilitated the needs of those with different accessibility requirements, such as those with limited mobility. Participants were also concerned that more disparate built environments would not adequately prioritise those with different accessibility needs. Typically, private vehicles were seen as being most advantageous for those with limited mobility, although a few participants highlighted the possibility that public transport advances may result in greater independence for those with different accessibility requirements. Accessibility was also highlighted as a potential challenge where there was high uptake and reliance on advanced technologies, with participants concerned that older individuals may be unable to keep up and would become isolated.

> **"The older generation don't know about high-tech; it would be too much change." –** *England (urban), Scenario 3*

4.2.3 Health

Participants often explored the impacts changes in each scenario may have on human health. Discussions about diet and food centred on the implications for health quite extensively. In general, participants expressed the view that beneficial climate outcomes should be aligned with beneficial health outcomes, and that there should be no tension or trade-off between the two, and often called on the personas Jack (due to his limited mobility) and Ananya (due to her having Alzheimer's disease) to demonstrate their concerns.

> **"[I like the idea of] the natural fruit and veg, the health benefits and low meat consumption."** *– Northern Ireland (rural), Workshop 5, talking about scenario 4.*

Participants were particularly concerned with the health implications of the diets that different scenarios put forward, and many participants' perspectives on the health implications of people's diets were contingent on the quality and type of food different people were able to access. These perceptions were often based on participants' inferences on how healthy different types of food may be in the future scenarios, as well as their strong emotional reactions to the idea of cultured foods. Linked to concerns around unequal access to healthy food, participants often expressed the view that those who are less well-off would have limited or no access to what they typically saw as healthier foods: primarily, those grown in more traditional ways (for example, farmed rather than cultured). A few participants acknowledged that it may be possible to develop food systems that promoted better health outcomes despite not being 'natural', but most struggled to accept this premise and expressed very strong opposition to it, disliking even the notion and envisioning it in ways that were beyond what was put to them in the workshops.

> **"But then you look at it [cultured meat], it gives you a bitter taste in your mouth as imagery is important…."** – *England (urban), Scenario 4.*

Some struggled to envisage what health and social care may look like in 2050 across all four scenarios, and some were concerned that it would not be prioritised where it was not specifically mentioned. There was, among some, an expectation that it would remain similar to its current form – one participant who was a carer, for example, said that they did not believe their situation would change significantly by 2050.

Another key focus was the impact of social isolation on individuals' mental health. While some participants noted that the greater use of advanced technologies in scenarios 1 and 3 may enable lonely individuals to interact more with family and friends in a virtual setting, most (if not all) participants were emphatic that the use of technology cannot and should not replace social interaction. Similarly, some participants noted that technology could and should be used in healthcare settings to enable greater efficiencies, and to enable greater independence or provide basic care for people such as the personas Ananya and Jack, who both had conditions requiring some level of care (Alzheimer's and limited mobility). However, there were still concerns that reliance on technology would result in greater isolation. As such, scenario 3 posed a particular problem for participants. There was a sense that the scenario would result in increases in loneliness, social isolation, and would negatively impact people's mental health in a significant way. Participants highlighted this with the built environment too, noting that a lack of access to greenery or nature in scenarios 1 and 3 would have negative impacts on mental and physical health.

> **"I think when people are living like this […], when we all need the human touch, I have concerns not just about [physical] health but mental health in this scenario."** – *Northern Ireland (rural), Scenario 3.*

4.2.4 Involvement

In their discussions, participants often emphasised the importance for individuals in each scenario to be involved in the wider decisions that affected their lives, to be able to make their own, informed choices, and to have agency over and within their lives. Most participants were critical of aspects of scenarios where they felt that, for some, there was choice in principle, but limited options in practice. This relates to other cross-cutting themes around equality and health outcomes. Participants criticised scenarios where people's social or economic circumstances may have impacted the decisions individuals were able to make – this concern was particularly expressed for those who were less well-off, or those who had limited access to certain amenities. For example, in scenario 3, participants highlighted that those with less money were less able to use more convenient forms of transport such as trains and CAVs, with some noting this would result in poorer individuals having to make do with less convenient means of transport.

> **"It's great if you're doing it voluntarily, but if you're forced into it without any other option, it's not so good." –** *Northern Ireland (rural), Scenario 2*

When discussing the choices available in the scenarios, participants sometimes interpreted these to the furthest extremes (far beyond what was presented in the scenarios). For example, in scenarios 1 and 4, some interpreted people's decision to eat less meat and more plant-based foods as meaning that meat was no longer available. This came through particularly strongly when discussing cultured meat in scenarios 1 and 3, and the popularity of plant-based diets in scenario 4. Most participants hoped that there would still be options available to eat farmed meat and some stated strongly that it should be up to individuals to choose whether or not to continue eating meat. Participants also expressed concerns that those who were less well-off might be unfairly impacted by increased prices for organic or farmed foods

(as scenarios 1 and 3 had cultured or technology-assisted options being cheaper or more readily available than organic produce or farmed meat).

> **"I feel like if you don't have enough money, you're going to be forced to eat certain food, and it depresses me."** – *Scotland (rural), Scenario 1*

A related concern that emerged was around societal divisions and the worry that some groups (those with more money or power) might have greater influence on how society operated in the future. Many of these discussions revolved around institutional trust. Levels of trust were varied across participants, although most erred on the side of scepticism. Some participants expressed wariness of those in power, such as the government or 'big tech companies', and as mentioned above were sceptical about some possible benefits of advances in technology or societal changes if they could see a profit motive.

> **"I don't trust the media, the government, big tech, or pharma." –** *Wales (urban), Scenario 2*

One participant was particularly vocal throughout the sessions about their outright distrust for governments, wealthy 'elites' and large corporations, often suggesting that there was a nefarious plan among these groups to take away people's freedoms entirely. The small number of participants who expressed extremely low levels of trust also tended to be less concerned about climate change overall. However, most participants recognised the importance of societal changes to reduce emissions. Some participants expressed positive views about changes in consumer behaviour, such as increased preference for plant-based diets or reducing consumption of goods. In general, there was collective emphasis on the importance for individuals and communities to take greater individual and collective responsibility over their behaviours, and for these changes to be encouraged and incentivised.

4.3 Plausibility and pathways

This section explores participants' views on how plausible the scenarios are. Although participants were encouraged in workshops 1–4 to accept the premise of the scenarios even where they might find some aspects implausible, there was an opportunity in workshop 5 to discuss plausibility. Participants often referenced the current day when considering plausibility, and suggested they thought some changes were unlikely, or contemplating if some scenarios showed too little difference for the timespan being discussed.

When considering the scenarios overall, some participants thought that scenarios 2 and 3 were the most plausible (sometimes suggesting this was the path society was already on). Some suggested that scenarios 1 and 4 were theoretically possible but were more aspirational than a realistic endpoint from where society is currently.

> **"Unfortunately, scenario 2 does seem like it could happen. Kind of scary but it doesn't seem too far-fetched. But also, scenario 4 if we're optimistic, we could get to a place like that. Making do with what we have and not buying so much." –** *Scotland (rural), Workshop 5*

Participants were, overall, worried about climate change and the risks it poses to current and future society. Their deliberations over the plausibility of the scenarios drew out strong, but often nuanced perspectives on different aspects of a net zero life. There were some participants who were concerned about the overall premise of reaching net zero by 2050. Some pointed to specific technological aspects (such as zero carbon flying) as being particularly unrealistic. Others expressed strong doubts about the lifestyle changes shown in the scenarios, suggesting that the 'status quo' and individuals' behaviours would not change in time.

Where participants expressed that they did not see a pathway from current society to a future scenario, they were asked what they thought would need to change and why they thought that change was unlikely. Below are the changes that they suggested could take place that would move society onto the pathway to some of the scenarios. These were factors that participants believed would be necessary to achieve the more positive aspects of the scenarios as presented (for example, a circular economy and widespread public transport). However, as highlighted in the below discussions, participants were sometimes divided in whether they thought these factors were plausibly going to be achieved before 2050.

4.3.1 Increased investment

A few participants felt like aspects of today's society that concerned them – including income inequality, inflation, and national and international mistrust – could exacerbate and plausibly lead to scenario 2. For other scenarios, there was a general sense that for them to occur there would need to be heavy investment in future technologies to bridge the gap between where technologies currently are and where they would need to be to realise the scenarios. Participants also highlighted that international transport does not have an efficient, low-carbon global network, which leaves no viable alternative to flying in some instances. Again, to move from flying to other means of international transport would require substantial investment.

Participants also expressed the need for considerably more investment in making UK public transport options more efficient and reliable. Rural participants highlighted that for any of the scenarios to be workable, there needed to be a far-reaching expansion of public transport networks and access to local amenities (such as schools or GP surgeries) in currently poorly connected areas in the future, often calling on their own experiences with limited public transport infrastructure and public amenities in their local area. One example of this is a participant who pointed to the nearest school for their children being a thirty-minute drive away, with no feasible public transport alternatives. This was particularly highlighted regarding scenarios with higher reliance on public transport and active travel options (scenarios 1, 2 and 4), with some participants saying they would struggle with day-to-day life if they did not have access to a private vehicle. Some participants were strongly sceptical that the travel and transport infrastructure envisioned by some of the scenarios (particularly scenarios 1 and 4) would be achievable by 2050, citing the current lack of reliability of similar services and their remote locations as reasons for this doubt.

> **"[To achieve scenario 1] we need to invest more in public transport in both rural and urban areas. The more we are connected by public transport the better for the whole community."** – *Wales (semi-rural), Workshop 5*
>
> **"I don't know how people would survive without the option of a car."** – *Northern Ireland (rural), Scenario 1*
>
> **"High-speed trains and bikes; it's not plausible for people like myself who work all over the UK, and you need flexibility and interconnectivity. How does this model help me?"** – *England (urban), Scenario 1*

The idea of all amenities being close to home in scenario 1 also raised questions of plausibility. Participants wondered how this would work in practice and how older people would navigate such densely populated cities. However, they suggested that making amenities accessible might be possible with the right supportive schemes in place (funding free bikes or having affordable CAV taxis, for example).

> **"[All amenities being close to home] I don't see how that's feasible, and I'm thinking about elderly people and accessibility."** – *England (urban), Scenario 1*

> **"I quite like the idea of being able to just have a cab thing when I want it."** – *England (rural), Scenario 1*

4.3.2 Reskilling and upskilling

When considering the plausibility of scenarios, participants most often considered the possible pathways to scenarios that they were more positive about, in particular scenario 4. To achieve a circular economy and the increased repairability implied by this scenario, participants considered what would need to change. Some highlighted a large gap in the general public's knowledge of how to repair certain items and a need for upskilling (referring to teaching individuals new or additional skills) and reskilling (referring to re-training individuals, particularly those who have lost their jobs or whose jobs are likely to change significantly) to facilitate the broader behaviour change of wasting less and repairing more.

> **"The need for reskilling. I think for someone like [the persona] Ash, he may well have to learn new skills to fit into society and gain employment. Education would be a massive importance to this society, to make sure people have got the skills for those jobs on offer in 2050."** – *Wales (urban), Scenario 4.*

Reskilling or upskilling was also referenced regarding jobs being threatened by high levels of automation in scenarios 1 and 3. Most participants were concerned that people may lose their jobs, but a few participants argued it may be an opportunity to facilitate reskilling. However, it was highlighted that this needed to be done cautiously and with sensitivity to those unwilling or unable to make those changes, endeavouring to ensure the security of people over and above runaway advances in technologies.

> **"There will be the automation of peoples' jobs, but I think government and other organisations would have to help people to reskill and retrain […]. Everybody should be given equal opportunities."** – *Wales (urban), Workshop 5*

4.3.3 Changing food preferences

Most participants acknowledge that societal trends around meat eating needed to change, and reducing meat consumption was seen as a necessary to reduce carbon emissions (even if not personally desirable). This was the case even among participants working in agriculture. None wanted meat to be taken entirely off the table, with particular concern regarding scenarios 2 and 3 where it seemed 'better quality' meat was inaccessible for people who had less money. Some participants were keen to encourage less meat consumption, perhaps through government incentivisation – for example, making plant-based alternatives cheaper.

> **"Some scenarios are quite scary in how they'll limit the choice of people who are less well off."** – *England (urban), Workshop 5*

> **"We have the responsibility to do the right thing for the planet, but the government need to incentivise that choice as well."** – *Northern Ireland (urban), Workshop 5*

Participants struggled to accept the premise that alternative proteins (such as cultured meat) or novel agricultural techniques (such as vertical farming) would be widely accepted in the future. They often suggested that this would be less desirable food than that grown or reared traditionally. There was a prominent belief among most participants that food produced using novel technologies was inherently less healthy than food grown in a conventional way. This affected how plausible they viewed scenarios with increased consumption of cultured meat. A few participants did say that if the right checks had been conducted to ensure cultured meat was safe for consumption, they would be fine to eat it. These participants cited more efficient land-use and potential climate benefits (such as reduced methane

emissions from livestock) as reasons they would choose to eat it. A few others also acknowledged that their reaction may have been driven by a lack of understanding of the technology used in these processes. However, most participants were uncomfortable with the concept and remained adamantly against it following deliberation.

> **"The idea of lab grown meat repulses me. I am a meat eater, but the thought of meat coming from a laboratory sounds really disgusting and unnatural."** – *Northern Ireland (urban), Workshop 5*

Participants were quite keen to encourage people and communities to grow their own, and eat locally produced, food. This was underpinned by wanting to see a stronger connection to the food people eat. However, this was seen as a big change from current society where people are often separated from agricultural processes. Some suggested that for food security reasons, imports would need to continue to mitigate risk.

4.3.4 Incentivising businesses

A few participants flagged that to facilitate broader societal change, businesses currently producing products with built-in obsolescence needed to be incentivised to change their operating model. One participant's suggestion was to implement some form of tax, similar to an emissions trading scheme, but with standards for repairability and using the full lifecycle of products.

> **"If companies are rewarded for producing things that are better for the planet, that would be a better way of attracting investment into that stream. As consumers, we have a responsibility to not be so demanding. That would be much more difficult to drive."** – *Northern Ireland (urban), Workshop 5*

4.4 Tensions and trade-offs

During workshop 5, participants were asked to consider the tensions and trade-offs inherent in the different scenarios. Some key themes emerged that participants felt should be considered by decision-makers working on net zero.

4.4.1 Infrastructure and investment

Participants identified a general tension between the infrastructure needed in some scenarios and the investment required. This was particularly prominent in discussions of scenario 1. A few participants noted that this could entail raised taxes or a reallocation of how taxes are currently spent (an example given was for more investment in infrastructure for rural areas rather than urban ones). There was a general sense that if, in exchange, greater efficiencies in public transport, public amenities, and the convenience associated with this were realised alongside a sense of community akin to scenario 4, raising or reallocating taxes would be acceptable to people. For some, the acceptability of higher taxes to fund a prospective 2050 would depend on allocation of funding to both urban and rural areas.

> **"The only way we can make it to scenario 1 is through investment in technology. That might mean more tax, but it also means governments need to be persuaded to invest in this, and businesses to do that as well […]. We have to put the building blocks into it, which might mean paying more, but in the long run, it would mean a cleaner, greener country." –** *England (urban), Workshop 5*

As mentioned above, particularly amongst rural participants, there was a strong desire that rural, and not just urban areas, should be brought along on the path to meet net zero, and a concern that people living in rural communities would be left behind if public transport failed to spread to more isolated communities.

> **"It needs to be more dispersed that than all in the city centre as it will create that divide. When that happens there are less services for rural communities, so they get forgotten."** – *Scotland (urban), Workshop 5*

Participants acknowledged that addressing this potential problem – although recognised as a real and existing problem for many rural participants already – will require conscious effort from government and the communities outside rural areas. This applied broadly to investment in infrastructure around built environments and travel and transport, with trade-offs including likely disruption caused by implementing wider public transport networks.

4.4.2 Sustainability and choice

Participants recognised the need for individuals to make sustainable choices to reduce emissions by 2050. However, they noted that sustainable and less wasteful choices sometimes came with trade-offs, such as being less convenient or affordable. Convenience, such as in faster forms of transport in particular, was an unwelcome trade-off for some, which they did not want to lose. Participants in general wanted options for people in the future so that they could choose what worked for them. Some cited personal reasons (for example, having family abroad or needing a reliable form of transport for childcare) for why more emissions-intensive options like driving conventional vehicles, or flying might be needed by people in the future. However, some participants also expressed the view that people needed to be more mindful – for example, not using planes for short trips. Another participant suggested that those with greater wealth or power needed to take responsibility too. Other participants suggested there was a role for incentivising and educating people to make more sustainable choices.

> **"You could do things like positive reinforcement […]. Incentivise people, rather than force and push people […]. Incentivising people and educating people […] to understand through education might be a key factor in terms of people's decision making" –** *England (urban), Workshop 5*

Participants were willing to accept changes so long as this did not occur at the expense of individual freedoms and result in individuals being mandated to live their lives in a certain way.

> **"Planning about 2050, we have to be quite flexible when introducing new policies and legislation. They need to take into account people's position now and personal circumstances. We can't just put everyone into one basket and make one decision for everyone. It's got to be more individual and person-centred."** – *Wales (urban), Workshop 5*

> **"[We may] end up with a world that, on paper, is perfect, which everyone isn't happy with because they've lost the things that gave them joy."** – *England (urban), Scenario 1.*

4.4.3 Innovation and tradition

Some participants accepted the use of advanced technology (such as AI, VR and novel food technologies), provided the right checks and balances were in place and privacy was protected. These participants tended to be those who self-identified as earlier adopters of new technology.

> **"If the risk assessment was there and due diligence was there, and the food I put into my mouth was genetically modified gave me confidence it ticked the quality assurance boxes, then yes, I would probably eat it. Without it, I am dubious and hesitant."** – *England (urban), Scenario 3.*

However, there were tensions identified around increased use of technology and jobs. Some participants were worried that in 2050, if Britain does end up relying on vertical farms over traditional farming, people living in rural areas would be forced by economic circumstances to move into urban areas, with their jobs

lost. Participants tended to see this as an extension of a wider trend they picked out in the scenarios: a prioritisation of the urban population centres over rural communities and argued strongly that this was not an acceptable trade-off.

> **"[*Scenario 1*] would be nice for those of us in the city. With scenario 1, there wasn't much of a benefit for people in rural areas."** *– Northern Ireland (urban), Workshop 5*

This trade-off was also raised regarding the use of technology in work and industry. For some, this was less of a concern, with one participant indicating that jobs that are common today would have been unheard of thirty years ago, and that this same trend could continue and allow these industries to develop. They highlighted this as potential win-win for consumers and workers, if workers were willing to retrain, which was also conditional on government intervention.

> **"There will be automation of peoples' jobs, but I think the government and other organisations would have to help people reskill and retrain. Some people might be more reluctant than to reskill than others, so they have to be thought of as well." –** *Wales (urban), Workshop 5*

5 The built environment

Key findings

Participants valued built environments that facilitated community and person-to-person interaction, sometimes at the expense of the convenience afforded by the integration of advanced technologies in homes and workplaces.

They were concerned about the implications of different built environments and were particularly critical where they saw them potentially leading to higher levels of insularity or facilitating criminality and violence. This concern was voiced with particular strength when discussing scenarios 1 and 3, which posited urbanised and densely populated environments.

Participants emphasised the importance of built environments being affordable and accessible, and were concerned about how the built environments in each scenario may impact different groups.

There was a feeling that built environments should not result in rural populations being left behind.

5.1 Views on the built environment by scenario

When discussing the built environment, prompt materials were used frequently to help participants envision what the built environment may look like in each scenario. In particular, participants often referenced the picture collages (see example in **Figure 5.1**) as a means of visualising how future homes may look, inferring from some the emotions they may feel when living in different scenarios, taking sometimes nebulous concepts (such as the modern, technology-reliant flats in scenario 3) and aiding participants to visualise themselves in the scenarios.

Figure 5.1: Built environment picture collage shown to participants for scenario 3 (other collages can be found in Annex B)

The built environment: scenario 1

***Summary**: Many people live in cities and those in rural areas feel neglected. Funding is channelled to urban areas. There is compact living in small households. There is a push for essential services close to home.*

Participants generally valued the prospective economic growth and greening of cities in scenario 1 but were concerned that the divide between rural and urban regions may be intensified – this was expressed more strongly by participants who lived in rural areas. There was worry about financial implications and some participants described this scenario as 'dystopian' and 'clinical'.

> **"Very clean, but maybe also a bit clinical. Maybe not a lot of personality there. Someone else used the word 'bland.' I think that's a great expression of what this world might look like."** *– England (urban), Scenario 1*

Although the rural/urban divide was most apparent in scenario 1, some participants, especially those living in rural areas, said they felt that in all scenarios rural areas had been neglected or forgotten about.

> **"I think people who don't have an urban lifestyle have been forgotten about**." *– England (rural), Scenario 1.*

The built environment: scenario 2

***Summary**: Less investment in cities has driven people out to the suburbs and rural areas. Housing demand outstrips supply and there is more multigenerational living. There is also a focus on 'self-sufficient' living.*

The increased multi-generational living in scenario 2 raised concerns about what it would mean for people with differing jobs, family relationships and wealth. Some participants argued that sharing a house with family members would be a healthy alternative, citing, for example, the isolation experienced by some during COVID-19 restrictions. In addition to strengthening relationships, participants said that multi-generational living could also be a practical solution to minimizing poverty and helping family members struggling to cope with the cost of living.

> **"People are really isolated just now. Especially after COVID-19 it's lovely to think of people being closer."** *– Scotland (rural), Scenario 2*

Nevertheless, some participants were hesitant about the practicality of this scenario and there was a strong consensus that individuals should have the freedom to choose whether they live with their family, instead of it becoming unavoidable. This was a particularly strong stance, as there were concerns that privacy and lifestyles could be substantially affected through the living circumstances in this scenario and were sometimes informed by their own family situations and experiences.

> **"I would have a concern about multi-generational living being out of necessity rather than desire."** *– **England (urban),** Scenario 2*

The built environment: scenario 3

***Summary**: People are increasingly living in self-contained 'bubbles' in suburban and rural areas. More people live alone. Dispersed new homes improve affordability. However, there is a reduced sense of community and there are fewer local amenities available.*

Participants generally found the built environment in scenario 3 isolating because of an over-dependence on technology, rather than real world interactions, and the physical isolation of living alone

in functional but small homes. For many, the scenario's depiction of the built environment was described as 'depressing'. Isolation was primarily seen as stemming from 'bubbles', which mean a lack of social interaction beyond an individual's household, reducing the sense of community, and from people staying at home rather than socializing with peers, which participants found likely to result in people losing contact with each other. This was especially the case amongst those who did not currently live in urban areas, or who lived in larger houses or family units, who were worried about the change this would necessitate. In this scenario in particular, participants said the collage (see photo compilations in **Annex B**) made them feel sad or upset, inferring from the images an isolated and lonely way of life.

> **"It looks like there's hardly any room to move anywhere. It's not somewhere I'd like to live. It looks like a depressing future to me." –** *England (urban), Scenario 3*

The economic gap between the rich and the poor was also expected to be accelerated and participants were concerned about how homeless people would be affected in this scenario. However, one participant noted that the investment in new buildings would be beneficial for those currently struggling to find properties.

The built environment: scenario 4

***Summary**: Population is spread across urban and rural areas. There has been low investment in new homes. People are living more localised and compact lifestyles and relying on increased local amenities.*

Some participants found the built environment in scenario 4 to be very similar to 2022, highlighting that older people are already moving in with their children for support and company, and that society is facing similar issues around infrastructure, as it will in this 2050 scenario. Participants were fairly positive about the scenario's built environment facilitating community-living.

There was concern about potential working arrangements, as participants largely agreed that working from home was not a viable option for many roles, including trade professions, social care workers, and doctors. Individuals with learning or cognitive disabilities were highlighted as possibly struggling to maintain focus on work or certain activities, and to socialize in the context of home working.

> **"In terms of work, I can't see this scenario being much different from where we are today." –** *England (urban), Scenario 4*

For jobs where it was possible, participants felt that working from home provided a welcome opportunity to reduce commuting costs for individuals in both urban and rural areas. In the absence of home-working, participants were concerned people, particularly those living in rural areas a distance from areas where they may work, would need to either drive or rely on public transport to travel into the city, potentially being subjected to delays or strikes, and spending long periods of time commuting.

> **"I like the idea of working from home, it's good because you don't need to travel much."** *– England (urban), Scenario 4*

5.2 Built environment themes

Participants' comments on the built environment across all four scenarios fell under several key themes. We explore these themes, with reference to the challenges and advantages participants saw as well as the trade-offs and opportunities they raised.

5.2.1 The built environment can foster a strong sense of community, which participants liked, but must not come at the expense of increased use of virtual technology

Participants generally preferred built environments in which they saw values around community and in-person interaction carried into 2050, and generally maintained that community was a core tenet of a fulfilling life in the future. Consequently, participants tended to like aspects of the built environment that facilitated these communities. For instance, most participants favoured a future where jobs and mobility were local, working from home facilitates socialising, and society felt altogether more cohesive. Some also liked the idea of built environments that promoted walking and cycling, instead of driving, and the consequent benefit of reduced air pollution. Coupled with the desire to experience a stronger sense of community, some noted that living in smaller houses would drive families to spend more time together, which was seen as a positive aspect by some.

> **"I like two or three generations living together. If they are loving, it's great when everyone supports each other." –** *Wales (semi-rural), Scenario 2*

Some participants felt quite strongly that scenario 4 offered a chance to enjoy a relaxing environment where individuals experience a higher sense of community and appreciate the slower pace of life in the countryside. Strong communities were perceived as a central pillar of social support to individuals, particularly in times of crisis, such as COVID-19.

> **"I appreciate with COVID happening, people have realised we're a lot more socially isolated than we were years ago. You live in a community, you might have a lot more social support." –** *Northern Ireland (urban),Scenario 1*

While the parameters for how communities develop varied from group to group, participants generally shared a dislike for scenarios with what they saw as a more insular society, with insularity often symbolised by the built environment. This was felt particularly strongly when scenario 3 was discussed. In this scenario, and in scenario 1 to a lesser extent (two scenarios with higher levels of technological development), individuals living in small flats, often alone or extensively using technology, were often viewed very negatively. In this vein, materials that visually showed a sense of isolation or more compact homes garnered more emotional reactions.

> **"I think in some ways, it seems society is going to get more insular. It's going to close communities off to each other." –** *England (urban), Scenario 3*

Participants tended to favour scenarios which placed more emphasis on the importance of community, even when this came at the expense of infrastructural and technological development. This was also the case in relation to food production. Participants were keen on increasing agricultural sustainability, even with potential negative economic implications such as current farming infrastructure being abandoned. This reflected a general desire among participants to slow down technological advancement in order to enhance social interaction.

> **"It would need to be a community working together and doing that when we can. If it was a community, I could see it working." –** *Scotland (rural), Scenario 2*

Multi-generational living

Some participants were fairly positive about the integration of some multi-generational living. The advantage, these participants noted, would be in facilitating closer and stronger familial ties. However, even in societies with higher communal living, participants feared that communities would become closed off, leading to gradual social disconnection and a loss of overall societal cohesion.

> **"I don't like the reduced sense of community. A lot of communities now are struggling for things like libraries, shops, even. People aren't going to be mixing with each other." –** *Wales (urban), Scenario 3*

Participants recognised that in some instances, multi-generational living may significantly reduce space and privacy but may lower the cost of bills and commuting, thus making life more affordable. However, others did note that alongside these benefits, multigenerational living may place an undue burden of care on individuals who may be unqualified or unable to provide it – particularly when considering older or ill relatives.

> **"I think multi-generational could work and there may be benefits, but there would come a time when the older person would need looking after themselves." –** *England (rural), Scenario 2*

The society in scenario 3 was described as 'atomised', with people increasingly socialising in virtual worlds, and often living alone in small, functional flats. While a few participants – who all said they currently lived in similar residences – argued that living in a block of flats could lead to a greater sense of community amongst neighbours, most participants remained sceptical.

> **"It would be like a prison." –** *Wales (semi-rural), Scenario 3*

5.2.2 City infrastructure changes, such as high-density populations, can impact accessibility, health, and crime

Participants identified that despite the practicality and quality of life that comes from densely populated cities where the built environment supports the growing population, this may have negative implications for privacy, space, and access to nature.

Densely populated areas were often seen benefitting people with physical disabilities, such as the persona Jack. Urban areas in scenario 1, in particular, were seen as providing easy access to amenities and were likely to have advanced technologies that would enable him to live somewhat independently. Participants came to similar conclusions around the persona Ananya. Scenarios where the population is more dispersed, such as scenarios 2 and 3, were seen as being less accessible.

> **"With all the groups that are there, they might rely on other forms of transport. What are there outside bikes and expensive planes, for the elderly, disabled and families?" –** *Wales (urban), Scenario 2*

Mobility and health within restricted space was, however, also seen as a particular challenge. Participants questioned how overpopulation would burden house utilities and school services, including the response to abrupt adverse situations such as fires, and longer-term health hazards such as pollution.

> **"There's an outbreak of disease, or a fire, there's huge risks there." –** *Scotland (rural), Scenario 1*

The risk of increased crime

Participants were not given specific information about crime or violence. However, they sometimes spontaneously raised concerns that more densely populated cities or scenarios with less social cohesion generally could lead to increased criminality, squatting and violence. They were then concerned that if crime did increase, those who could afford to would move into 'safer' gated communities to avoid areas with higher crime rates. This was a particular problem in scenarios 2 and 3, where social cohesion was seen as lower. This concern was targeted particularly towards families with young children, who may struggle to raise them in an unsafe environment, and older people who may suffer from high crime rates,

with the personas Obafemi and Lisa, Jack, and Ananya often being used as examples. Participants were worried this may facilitate the creation of yet more isolation, with those unable to afford to live in safer areas staying in their homes more often, retreating from neighbours and community.

In scenarios with less developed city centres, a few participants highlighted a potential opportunity to use empty or unused spaces as additional homes, to ease the burden of housing costs. For example, in scenario 2, vacant shops were depicted in the collages shown to participants. Some participants noted that there may be a shift in how individuals in 2050 view house ownership and renting, with some highlighting that house ownership may become either less feasible, or less attractive.

> **"People might think about renting a property rather than owning a property. If these city centres are full of empty shops, then they could be used as potential housing sources for people." –** *England (urban), Scenario 2*

Participants linked crime to a concern around gated communities, which were an aspect of the built environment in scenarios 2 and 3. Participants felt such communities have not historically proven to be successful, and some noted that they can be a particularly harmful living environment for segregated communities.

> **"In a gated community will we be restricted to doing certain things like lab rats?" –** *England (urban), Scenario 3*

> **"I come from an already segregated society and gated communities will do nothing to integrate people from diverse backgrounds." –** *Northern Ireland (urban), Scenario 2*

5.2.3 Geographical inequality between urban and rural areas should be considered and mitigated where possible

Participants had conflicting views about where in the UK infrastructure should be developed. For some, the chance of communities transforming the countryside with large buildings and factories to facilitate population dispersal from towns and cities was a concern; this was held particularly strongly by those living in rural areas, but also by some who lived in cities but were concerned about access to nature. However, investment focused wholly in urban areas was also seen as a negative, as participants were concerned it would result in rural areas being cut off.

There was also concern around ensuring there was sufficient infrastructure to support either urban expansion or the dispersal of populations into rural or semi-rural areas. For example, participants sometimes struggled to envision the integration of electric cars in urban areas, particularly given the dense structure of the city and the lack of infrastructure to support electric vehicles. Ability to travel to work both to and within urban cities troubled participants in scenarios 2 and 3, where it was generally believed that transportation will not drastically improve by 2050, despite the anticipated travel price increase.

> **"We already have enough of a problem in terms of medical care and transport. That's not going to have improved." –** *Wales (rural), Scenario 2.*

Participants questioned whether weak transport networks and lack of existing infrastructure to support future technological developments in rural areas regions in the countryside would be left behind – and if so, to what extent this would occur.

5.2.4 Accessibility and affordability of the built environment were important, but a certain level of technological innovation would be helpful

Throughout all scenarios, the notion of inequalities and accessibility challenges in the built environment was prominent, and was often built on participants' inferring what different aspects of the built environment may lead to, rather than what was specifically built into the scenarios.

Income inequality

In terms of inequality, participants were concerned by what they saw as 'us versus them' when discussing how and where people lived and worked. Often, this involved a sense of physical separation between what was seen as the 'haves' and the 'have-nots'. This came through strongest in scenarios where income differences were explicit and geographic (for example, scenarios 2 and 3 where wealthier people lived in gated or isolated communities). Participants also questioned how expensive living in newly built high-rises may be, and how accessible it would be for poorer individuals to get on the property ladder. Similarly, in scenario 4 participants were concerned that multigenerational homes would end up largely being used by those who could not afford to do anything else.

> **"I just think 'expensive' when I see this future world." –** *England (urban), Scenario 1*

Mobility and accessibility

Accessibility was an important aspect of participants' response to the built environment. There was less agreement amongst participants in how they viewed accessibility in these environments, but they generally agreed that built environments (and the infrastructure supporting them) should facilitate those with different accessibility requirements.

Technological innovation

In scenarios with high levels of technological innovation, participants felt that a key challenge would be ensuring that built environments balance use of technology and real, human interaction. Participants generally held pessimistic views about the potential knock-on effect of technology on social interactions between households and on those who lack the skill, financial flexibility and physical or mental ability to synchronise their lifestyle with the future technological advancements.

> **"He's [the persona Ash] been unemployed and has ADHD, so how's he going to afford living in a new environment?" –** *England (urban), Scenario 1*

Despite the higher technology scenarios being sometimes viewed as 'dystopian', some participants found positives in the built environments. For instance, though the prospect of a high-technology world was generally met with wariness (see **Chapter 4**), some participants felt that the integration of VR into homes may prove to be helpful for individuals who live with Alzheimer's disease, enabling safe communication with loved ones, and potentially facilitating therapy treatments.

> **"I believe a certain amount of VR is being used for patients with Alzheimer's already quite successfully. I just thought I would let you know some of that is already happening and it seems to be quite successful." –** *Northern Ireland (urban), Scenario 3*

6 Travel and transport

Key findings

Participants were positive about active travel, citing the climate benefits through reduced emissions, health advantages, and the greater reliability, although some were concerned about reduced convenience.

Concerns around convenience were also expressed about using public transport and other low carbon transport options, particularly when discussing international travel.

When considering relying entirely or wholly on public transport, participants were concerned about reliability, as well as the limited choices available to some groups. This was particularly the case when considering those with different mobilities, or tradespeople needed to carry materials and tools to work.

Similarly, participants hoped transport infrastructure and options would prioritise accessibility and affordability.

6.1 Views on Travel and Transport by scenario

Across the scenarios, participants often linked travel and transport to the built environment unprompted, and the two were often discussed in tandem, with conversations about how and where people live and work naturally leading into conversations about how people travelled around these areas. The personas were often used when discussing this connection between travel, transport, and the built environment, with Jack in particular being used as an example of someone whose mobility needs would need to be taken into account across all scenarios – for example, relying solely on public transport.

Travel and transport: scenario 1

Summary: *Connected and autonomous vehicles (CAVs) are available as on-demand shared travel. There are zero carbon international flights but less domestic flying. There has been greater investment in low-cost urban public transport and train travel cheaper and easier between cities.*

In scenario 1, participants expressed a range of views about travel and transport, which were mostly contingent on the practicality of certain transport options, the equality of access to different options, and the choice for individuals in these worlds to travel as they may need or want to. Some participants also theorised that those with limited mobility, such as the persona Jack, those with young children, or those with respiratory conditions like the personas Obafemi and Lisa, may also benefit from the integrated travel networks in this scenario.

However, some participants questioned the practicality of these changes in transport. Participants questioned how technological advancement in transportation would operate in a complementary manner to the existing infrastructure provided in cities. Following from that logic, participants were puzzled as to how the public can be incentivised to reduce their car use.

> **"It would be cheaper for me to go in the car. Public transport would only be appealing if it was a lot cheaper." –** *Wales (rural), Scenario 1*

Travel and transport: scenario 2

Summary: *Connected Autonomous Vehicles (CAVs) are available for the rich. Public transport is available but is fragmented outside of cities and has received little investment. There has been moderate investment in active travel infrastructure. Flying is increasingly expensive.*

In this scenario, participants were concerned about the lack of options they saw as being available to them. Scenario 2 raised concerns about potentially expensive flights challenging people's capability to visit family members in other countries. Participants felt scenario 2 would only be feasible assuming that families live close to one another and were concerned about the ability of individuals to move autonomously. This was a concern that some participants expressed about themselves, but also about those who were older or disabled due to the dispersed population and lack of public transport options or affordable private transport options. Several participants were worried on the impact of imported goods as well.

> **"I would choose alternative transport. If I rely on buses in the beginning then I might be changing to cycling or walking, which might be a bit more environmentally friendly."** *– Scotland (urban), Scenario 2.*

Short-distance travel was also seen as being impacted: once again, participants often highlighted that cycling is not a feasible option for families with young children, immobile or disabled individuals, and older people, or for activities such as food shopping. If commuting circumstances became challenging, a few participants highlighted that children are also at risk of missing school. There was further concern that a sudden increase in cyclists may cause more road accidents. Scenario 2 was overall characterised as 'gloomy' and more economically than environmentally driven.

> **"With my 2 children and where I live, in a small hamlet, the nearest big shop is over an hour's drive away. It wouldn't be possible for me to get around everywhere on a bike with young children."** *– Scotland (rural), Scenario 2.*

Travel and transport: scenario 3

Summary: *There is a strong uptake of CAVs by those with higher incomes. Long distance public transport has received increased investment and has improved substantially. However, the cost of public transport has excluded some of those with lower incomes. International flights for holidays and leisure remain popular.*

Views on travel and transport in scenario 3 were slightly more positive than scenarios 1 and 2 – though participants noted that the ones benefiting the most would be those with no mobility difficulties. However, participants also felt strongly that scenario 3 disadvantaged those who were less well off; they reacted strongly to the artefact (Annex B) which positioned a skiing trip in the alps against a cheaper skiing trip in a virtual reality world. They further expressed concern for the actions people may resort to as the result of high prices – such as catching trains without a valid ticket and causing disruptions.

> **"Maybe the benefits are offset by flying. It looks like the poorer are excluded from all types of transports."** *– Wales (rural), Scenario 3*

Overall, participants saw travel and transport in this scenario fairly similar to our current environment – perhaps the only difference being that network connectivity will have substantially improved by 2050, and the addition of CAVs. In this scenario, personas who would be better off were seen as Chloe and Lisa, primarily due to their occupations (an electrician and a transport worker). Therefore, it was deemed

unlikely that demand for either of them will reduce in this future scenario. The personas of Ananya (who lives with Alzheimer's) and Jack (who has limited mobility) were seen as also likely to benefit in scenario 3 as they were anticipated to maintain a level of autonomy by choosing to use their own cars.

> **"I was going to say it does sound like if you aren't rich, then how much interaction would you have with these things."** - *Scotland (rural), Scenario 3.*

Travel and transport: scenario 4

> ***Summary:*** *Private car ownership is less frequent and there are few CAVs in use. Walking and cycling are common, and people can access an efficient and well-maintained public transport system. Flying domestically or internationally is rare with more options for slower and less emissions-intensive options (like high-speed trains or boats).*

In scenario 4, participants were often positive about public transport and active travel. However, some differences in perspective did emerge.

Some participants were critical of sacrificing the convenience of travelling by plane in order to travel on slower means of transport. A few noted that this would be impractical considering annual leave allowances, saying that this would necessitate a shift in how individuals viewed travelling, making the journey into part of the holiday, something participants were often critical of. Affordability was a further point of contention, as participants inferred that wealthier individuals would have greater access to more practical and convenient transport options. Participants thought that individuals with a similar profile to the persona Ash (from a lower socio-economic background) may struggle to pay for transport. Working on the premise that the transport network should be developed without prices rising, participants suggested consulting other countries on how to successfully implement train systems without excluding those of lower socio-economic status.

> **"I'm just thinking about [the persona] Ash who is unemployed. Unless public transport is cheap, he may find it difficult to get around."** - *Wales (urban), Scenario 4.*

6.2 Travel and transport themes

6.2.1 Participants were positive about the reduced emissions, health benefits and reliability associated with active and public transport

Participants tended to be fairly positive when considering scenarios with active travel options, particularly when these were more beneficial for their health and the environment. This attitude was particularly prevalent in scenarios 1, 2 and 3, where participants suggested that active travel, as opposed to other means of transportation, was not only healthier, but also offered the chance to enjoy sceneries in the countryside. Additionally, some participants highlighted that it allowed for greater flexibility and reliability, as opposed to being affected by potential strikes and delays.

> **"I like the fact that people are walking and travelling more. That can only be a good thing. It's good for health, mind, and carbon footprint."** – *England (urban), Scenario 2.*

When discussing scenario 4, participants were focused on the positive environmental impacts from reducing emissions by replacing cars and flights with high-speed trains. Scenario 1 received similar positive responses. There was a particularly strong preference for using trains, as they can be 'relaxing', cheaper than driving a car, and beneficial for reducing air pollution. Several participants were keen to replace domestic flights with national rail, but in doing so, they highlighted the importance of fixing connectivity across both urban and rural areas – though were pessimistic about achieving this by 2050 given the current progress rate.

> **"I don't drive, I prefer public transport as it's much better for the environment and cheaper if you're the only one paying household bills."** – *England (urban), Scenario 1.*

Although there was concern for people who may struggle to get around without driving, and for the practicalities of cities becoming harder to manage, one participant noted that people tend to adjust, and that the societal changes away from personal vehicles may be normal and accepted in 2050.

> **"People might think, 'Oh my God, how are we going to cope?' but people do. That's human nature."** – *Wales (rural), Scenario 2.*

Some participants were concerned with the impact the development of new infrastructure in urban areas may have, with worries around long queues of people forming at bus stops and other public transport stations, thus worsening traffic, and potentially damaging green spaces at the expense of developing public transportation.

> **"It falls down to the options that are available and the cost."** – *Northern Ireland (urban), Scenario 2.*

6.2.2 Participants needed to be able to rely on the transport infrastructure to support changing their travel behaviour, but noted that some groups in society will have less flexibility in this choice

Despite being open and mostly positive to using alternative transportation (for example, rail travel, walking, and cycling), participants highlighted several challenges to this.

Some questioned how reliable public transport infrastructure and services could be. A few participants highlighted that if trains or other means of public transport were unreliable in scenarios 1 and 4, it would be incredibly difficult for people to get around. Additionally, participants often noted that public transport was unlikely to be practical for some people, pointing to personas who embodied certain groups. Examples given were tradespeople (referring to Emily and Chloe), who must carry their equipment to and from job sites, carers who must travel between houses, and older people who may be less inclined or unable to cycle around town (referring to Jack and Ananya, as well as participants' own experiences).

> **"No matter what, it always should be subsidised because not everybody can afford a car. Still many people need to use public transport and it needs to be affordable and reliable."** – *Wales (semi-rural), Scenario 2.*

Many participants struggled to put themselves into the scenarios with high levels of public transport reliance, often saying this difficulty was due to uncertainty that the current or future governments would be able to achieve the changes necessary by then, or to facilitate the networks being sufficiently reliable. They also questioned how this scenario could be practically delivered if impacted by strikes or weather conditions that would prohibit the public from using public transport.

> **"If everyone is taking the same mode of transport, you need to create more railway lines, trains and routes. They need to be more reliable […]. You'd have hoped they'd have sorted it out by 2050."** – *England (rural), Scenario 4.*

Nevertheless, when compared to the rural areas, some participants argued that the existing infrastructure within cities may provide a solid foundation upon which to improve the network; rural areas were seen as less likely to be able to keep up with such advancements, and thus individuals in these areas may feel bypassed.

> **"I don't live in a rural area as such, but where I live now, it's not a major city and the train service is already bad, and I can imagine anyone living in rural areas is going to feel bypassed."** – *England (urban), Scenario 1.*

6.2.3 Accessibility and affordability of travel infrastructure was extremely important to participants, in particular for those with limited mobility

As when discussing most aspects of the scenarios, accessibility and affordability were recurring themes Participants focused in particular on people whose physical disabilities affected their mobility.

Participants were often concerned that scenarios with extensive networks of public transport may struggle to cater to the persona Jack (and others with similarly limited mobility), and that the lack of private vehicles to transport him may hinder his ability to be independent. Similarly, participants were critical of scenarios where active travel was a primary means of transport in local areas, noting that this would likely isolate individuals with limited mobility further. Participants often voiced similar concerns for the persona Ananya, whose illness would likely make navigating public transport difficult, and for the personas Obafemi and Lisa with their child, Tunde, who may struggle with travelling with a baby in scenarios 1, 2 and 4.

> **"You'd hope that for people like [the persona] Jack, who want to keep their independence, that they could use them and have access to a car, rather than having to rely on other people to get them on and off trains."** – *England (rural), Scenario 4.*

As previously mentioned, participants also often highlighted challenges around the affordability of different transport options. The cost of public transport was often raised, as was the idea that some transport options such as private vehicles or CAVs may be prohibitively expensive for many.

Some participants had particularly strong views when it came to how they would be able to travel. In scenarios with a heavy reliance on public transport (scenarios 1 and 4), participants noted that these transportation options were less practical and less flexible in many circumstances – and expressed concern that the poorer would have more limited options.

> **"There were less options because of reduced flights or routes, you would be forced – to stay." –** *Northern Ireland (urban), Scenario 2.*

7 Work and Industry

Key findings

Participants were generally positive about the circular economy, particularly around changing consumption patterns and fostering a culture of repairing more, with some participants also in favour of 'behind the scenes' technology enabling resource efficiency.

There were concerns about the skills gap, and the safety of refurbished or repaired goods.

Some participants were concerned about how jobs may change, especially when threatened by automation.

Participants tended to be wary about the use of advanced technology that they saw as being 'intrusive' in people's everyday lives. While participants did imagine some benefits for technology in the workplace and at home, concern remained around the possible impacts on how people work and live, particularly when thinking about isolation and digital inequalities.

7.1 Views on Work and Industry by Scenario

Work and industry: Scenario 1

***Summary**: There is a thriving competition based on a free market and a growing circular economy. There is a growing focus on sustainability and technology assists people in making sustainable choices.*

Participants had fairly mixed views about manufacturing and service industries in this scenario. For many, the changes made in advancing a more circular economy model were seen as positive.

> **"I quite like the way that it's attempting to eliminate consumerism and the throwaway culture we have, such as fast fashion." –** *England (urban), Scenario 1*
>
> **"Repairing items, seems to be less consumerism, which is a big plus."** – *Scotland (urban), Scenario 1*

There were, however, participants who expressed strong concerns about the reliance on technology, and potential loss of human contact. Some concerns were around a vision of future advanced technologies influenced by science-fiction representations (for example, AI becoming sentient).

> **"[We need to stop] AI from rising up and taking over the world."** – *England (urban), Scenario 1.*

For others, concerns around technology were grounded in the implications this may have for the economy, with a strong initial worry about the impact of automation, changes in jobs, and the risk of leaving people behind or leaving them at a fundamental disadvantage.

> **"I think that only high-tech jobs or highly skilled jobs will be available, unfortunately. There will be fewer jobs for unskilled people, unless my opinion is wrong."** – *Wales (semi-rural), Scenario 1.*

Work and industry: scenario 2

***Summary**: There is an increase in domestic competition and reshoring. Many goods are still designed with inbuilt obsolescence and 'greenwashing' by companies is common. In general, there is a*

throwaway culture. However, those living 'off grid' have a 'make do and mend' attitude. There are also service exchange or mutual goods exchange systems.

Jobs and the economy were areas where participants found some positives in this scenario. Many participants liked the barter economy, often envisioning it based on a 'pay what you can' principle, which they saw as advantageous for people who were struggling financially, and enabling low-income people to access services they otherwise may not have been able to.

> **"Maybe people aren't in a position where they can pay you, so if you do a bit of work for them and they do something in return. I think it's a nice thing to do rather than always being about earning."** *– Northern Ireland (urban), Scenario 2.*

Another aspect that participants appreciated was the potential for greater community and human contact.

> **"Over the pandemic, people missed that human contact. I'm glad to see it's still there in 2050."** *– Wales (urban), Scenario 2*

However, participants highlighted concerns about waste and obsolescence, as it had been specified that consumption has continued as now. Participants were worried about continued trends in consumption and, in particular, products becoming obsolete quickly. They were also concerned about what jobs and employment might look like in a society where the population is fairly dispersed and divided, with the wealthiest living in gated communities – making it challenging to envision how, for example, carers may access different individuals who need care without relying heavily on a private vehicle. Access to amenities was thought to be mostly through technology, which participants were again critical of due to the risk of both social isolation and digital exclusion.

> **"Not everyone is tech savvy, not everyone has a smartphone, or uses internet banking, and I think they are discriminated against in this case."** *– Wales (semi-rural), Scenario 2*

Work and industry: scenario 3

> ***Summary:*** *There is international competition and increased reshoring. High consumption and increased technological obsolescence creates a throwaway culture. However, there are also better recycling solutions. Cryptocurrency is increasingly used to purchase services in both the physical and virtual world.*

In this scenario, participants were particularly concerned about two things: the heavy reliance on technology, leading to a more insular society, and what they saw as a more wasteful economic model based on obsolescence.

> **"A culture designed around keeping people spending on big tech. We've all heard of false economies, we buy any given device and in a couple of years' time it's failing on us because it's designed that way."** *– England (urban), Scenario 3.*

Participants were concerned that greater reliance on technology may erode creative disciplines and culture, as well as posing strong challenges to both unskilled and skilled jobs. Technology, in particular AI and VR-based technology, was seen as potentially leading to more isolated communities and a loss of human contact. Participants were concerned about the potential implications for people's physical and mental health, and the impacts on particular populations, such as older people.

Work and industry: scenario 4

Summary: *Smaller businesses are thriving and benefiting from localisation. Big businesses are promoting positive societal values to attract customers. There is an increase in shared goods and services. The cost of goods is high and there is an increase in repairing rather than replacing items.*

Participants saw the potential for increased jobs and an improved economy in this scenario, highlighting in particular the income growth for the poorest, greater altruism amongst businesses, and the emphasis on repair and mend, and other circular economy measures.

> **"The income growth for the poorest is high, and that isn't the case for the richest. I've never lived in a world where that's the case so that would be really interesting."** – *Scotland (rural), Scenario 4.*

> **"If companies are more altruistic, and not just driven by profits, then that would be good for society. In this scenario, that seems to have been created."** – *England (urban), Scenario 4.*

There was a sense that individuals had a part to play in this shift as well, for example by purchasing products from more socially responsible businesses and partaking in community-based initiatives like the Library of Things responsibly.[12] Participants were also more positive about the role of AI in this scenario and were more comfortable with the fact that it was tightly regulated.

However, participants also highlighted potential problems. A few were concerned about the government needing to balance the books and what aspects of spending may be cut to accommodate this. There was also some discomfort over the lack of investment in new technology, with some participants highlighting the need for balance but having an expectation that there would be *some* innovation.

> **"It said there wasn't much investment in new technology, which is a shame. I think it would be fantastic to come up with new ways of things and make things easier for people."** – *Scotland (rural), Scenario 4.*

Participants also envisaged changes in how people would work. There would be changes in how retail jobs would operate, for example, towards either second-hand or a repair-based shopping model. For others, there were positives in what they saw as increases in jobs for unskilled or semi-skilled labourers – although some were concerned that jobs would be lower paid.

[12] A "Library of Things" is a collection of objects that can be loaned or borrowed. These objects tend to be home or DIY focused: for example, toolkits or objects like vacuum cleaners. The intention is to allow individuals access to these goods that would otherwise only be used occasionally, an affordable and less wasteful alternative.

> **"The society described requires unskilled and semi-skilled workers to maintain and support it. Perhaps [the persona] Ash can retrain to repair things, so it would be a semi-skilled role and he would be employed. That's how I see income growth for the poorest."** – *England (rural), Scenario 4.*

7.2 Work and Industry Themes

7.2.1 Participants were in favour of the circular economy, changing consumption patterns and repairing goods, but were concerned about a skills gap and safety

Many participants felt that a circular economy and changes in consumption patterns to facilitate this would be advantageous, fostering a culture of repairing goods. Some participants argued that this shift would create jobs and lead to new skills being developed. They felt this would be particularly advantageous to individuals with existing practical skills, drawing on the personas Chloe and Emily in their roles as an electrician and a plumber, and individuals who may benefit from training in a practical trade such as the persona Ash who is unemployed and lives with ADHD, who participants thought this kind of training would benefit.

As mentioned above, participants also saw the concept of 'pay what you can' as advantageous for those on lower incomes, with less money but with skills to exchange. They also felt it would promote a stronger sense of social cohesion.

> **"I think it's good you haven't got to pay a fixed price because if you can't afford to pay you could work for a meal, and pay something."** – *England (rural), Scenario 2.*

The idea of a barter economy was also seen as possibly advantageous for its potential to increase connectivity. Some participants felt that to survive in the world of scenario 2 in particular, one would need to communicate and form lots of new connections to get by.

> **"If trading things is a currency, as much as buying and selling things, then you'd need lots of contacts. I think people would tend to open their lives more, so they'd have more contacts for bartering and trading."** – *England (urban), Scenario 2.*

Similar to a circular economy, participants thought that the barter economy would be particularly advantageous for those with skills to exchange, such as the personas of Chloe and Emily (who were tradespeople). Participants liked the fact that this may allow income inequalities to balance out to some extent, through providing opportunities for individuals with lower incomes to access goods and services that they may otherwise have been unable to, and to exchange their own skills instead of currency. However, it was felt by some that people should have the freedom to choose whether they would want to engage with a barter economy and that being paid in cash or skills should be a personal choice.

For similar reasons, participants were also broadly positive about the idea of a Library of Things in scenario 4. The idea of sharing or borrowing goods, particularly those that are not used very often and are expensive, was popular amongst participants, as this would provide access to goods for those who may otherwise be less able to afford them. There was some concern about sharing goods meaning that people would not have access to things readily when they needed and that things may get broken, but participants generally felt that, if managed correctly, this could be a positive. They felt similarly about renting items instead of purchasing them outright.

> **"I used to work in an office but now I work from home. So I'm not too bothered about what I wear. I have suits I haven't worn for 3-4 years. I think having the option to rent something for an occasion, I don't think that's a bad idea at all."** – *Wales (urban), Scenario 4.*

Participants also spontaneously imagined complementary, additional possibilities that they liked, again along these same lines. For instance, apps allowing people to share food that would otherwise go to waste, which some had experience of already.

> **"I think the concept is really good. We have some apps that promote products that are not yet expired, but you can still use it. If people no longer want something and they want someone to make use of it. I like that concept very much."** – *Scotland (urban), Scenario 4.*

Most participants liked scenarios which focused on circular economy aspects, such as repairing, and had lower levels of consumption, in particular in scenario 4. However, some did say that this economic model may lead to negativity around individuals being unable to purchase new products; scenario 4 explicitly noted there were fewer new models on the market, due to a drop in consumer demand, and that more people were repairing rather than replacing where they could. Some participants also raised concerns around repairing and reusing electrical items due to safety concerns, but acknowledged that if the right safety checks were in place, this would be a positive aspect of future scenarios.

> **"Refurbished things are just as good if they're tested"** – *Northern Ireland (urban), Scenario 4.*

Similarly, participants disliked scenarios with a throwaway culture and expressed concern for the amount of waste that might exist in these worlds. Indeed, this was highlighted as a potential function of advanced technologies that participants liked – the ability to solve problems faster and more easily at an industry level, and to help manage resource use and efficiencies in the background.

> **"I cannot stand waste or duplication in anything, so if AI champions that and drives resource efficiency and usage, then I'm all for that."** – *England (urban), Scenario 4.*

Many participants alluded to current pushes to waste less single-use plastic and saw the scenarios (particularly scenarios 2 and 3, and to a lesser extent, scenario 1) as a step backwards with their economy's continued focus on individuals consuming more products. Some participants related this explicitly to sustainability and climate change.

> **"I wonder where all the waste is going, and what we're doing with the waste. Are we not going to be sustainable in 2050, and greener? It seems like we're going backwards and throwing things away."** – *Scotland (urban), Scenario 2.*

This was the case even when scenarios posited that technology behind the scenes implemented some circular economy measures (for example, the use of AI in scenario 3 and scenario 1, to help manage resources). Some participants were critical of these measures, seeing them as in some ways removing people's responsibility for their own actions.

> **"As a society, we haven't been able to take any ownership of our own usage […]. I feel like if things are done for people, it makes it a lot less secure and lasting. If we aren't making conscious choices about being green, that's great until whoever is doing it for us stops."** – *Wales (rural), Scenario 1.*

7.2.2 Participants were wary of the widespread use of technology without tight regulation, and were concerned about possible impacts on work life, home life and inequality

Participants' views on technology sometimes differed, but there were some common trends. The main commonalities were highlighted in **Chapter 4 (4.2.1)**, when discussing technology as a cross-cutting theme, and primarily related to wariness around technologies and its uses in day-to-day life. This section explores how participants saw technology as potentially impacting their lives and workplaces.

Technology in the workplace

Participants' views on advanced technologies were discussed both in terms of its impact on the workplace, and how it would impact the kind and availability of certain jobs. Generally, participants disliked the amount of power that large technology corporations would get through increases in the use of advanced technology. While some participants suggested that the use of AI and automation may free up time for individuals to pursue educational or career paths based on the joy of learning, others were worried that AI and automation may narrow the options available for studying and careers, potentially forcing individuals down certain paths. There were further concerns that certain industries, in particular the creative industry, may struggle with not having enough jobs.

> **"Going back to the idea around education, in a world where all jobs and industries are dominated by tech, people my age are going to be forced into studying IT or computer science, which might not be what people want to do." –** *England (urban), Scenario 1.*

Indeed, some participants were concerned about a technology-reliant world making it challenging to even find a job. Older participants in particular were concerned that with everything being virtual and online, CVs could be lost in a sea of applications. Participants who highlighted this potential challenge drew parallels to today.

> **"It's not like the old days when you could hand a CV in, everything is computerised now. You have thousands and thousands of people applying online for job applications."** – *England (urban), Scenario 1*

In this vein, participants generally agreed that some professions would be impacted more than others by increases in advanced technology being used. Participants highlighted in particular the potential for automation to make people redundant. This challenge was raised for trades-based jobs, such as those of the personas Chloe and Emily, as well as for highly skilled work such as lawyers and doctors, epitomised by the personas Tom and Prisha. This concern was most often noted in the higher technology scenarios, such as scenarios 1 and 3.

> **"There's nothing better than creativity. The origin of thought, people writing poetry, literature. All that could go overnight. You're going to have AI writing stories for websites or something. I think that would be really sad." –** *Wales (urban), Scenario 3.*

For others, however, there was a hope that advances in technology could be used to perform tasks to a higher standard than is possible for humans. This was expressed around healthcare, which was a sector that was discussed in more detail by participants. For many, there was a sense that the medical profession may benefit from advanced technology – for example, in using novel technologies with diagnoses.

> **"For medical reasons, detecting diseases and cancers and such, I do think it's good."** *-England (urban), Scenario 1*

It was suggested that technology might not only benefit the medical profession, but individuals in society with particular medical needs. Participants expressed hope that people like Jack, with mobility requirements, might have a more suitable wheelchair, or that the persona Ananya and other individuals living with degenerative conditions could also be aided more effectively through advanced technologies.

> **"[The persona] Jack should definitely have a hover chair with AI control, so he could just say, 'Take me to the pub.'"** *– England (urban), Scenario 1.*

> **"If AI is going to be as clever as we think it is, it might be able to develop a screen that she can have, to help her remember her real life. The AI could know her life and give her triggers when she meets someone she doesn't recognize, like her daughter, for example. It could benefit her by having something to ease her condition."** *– England (urban), Scenario 2.*

However, it was felt that not all the changes that might be seen in the medical profession would be positive. Some participants drew on the shift to online or telephone consultations resulting from the COVID-19 pandemic that are already being used today, and the loss of personal touch this entailed.

> **"We're already not seeing doctors face-to-face, it's on the telephone most of the time. There will be a lot of alternatives to the modes of healthcare, that people wouldn't believe can exist. Healthcare is going to become more technological. I agree […] that it has to be done by people. You wouldn't want to be cared for by a robot."** *– England (rural), Scenario 1.*

This speaks to a wider concern that was highlighted in the cross-cutting themes, around technology replacing or jeopardising face-to-face interactions and relationships.

> **"You need a human being, not only for mental health problems and comfort, but you also have to do extremely heavy personal care jobs."** *– Wales (semi-rural), Scenario 1.*

Outside of the medical profession, the impact of advanced technologies on work and employment opportunities was seen as potentially positive. Some participants felt that retraining and learning new skills in line with societal shifts would be a positive, particularly for those who were younger or willing to learn. Participants noted this in particular as being beneficial for the persona Ash, who was noted as being unemployed.

> **"I understand the worries of how some jobs are being taken over by technology, but I think with tech, that can generate more job opportunities for people so they can develop more skillsets to better suit themselves to these opportunities. I see this as a positive thing as you constantly upgrade yourself to better suit society's needs."** *– Scotland (urban), Scenario 3.*

Indeed, some participants highlighted that while certain jobs may change – for example, doctors, lawyers and hairdressers were mentioned explicitly – this would be a case of adapting rather than completely abandoning the professions altogether.

In terms of education and training for jobs, one participant felt the fact that you can **"can learn everything online"** (Scenario 3) may be an advantage of scenario 3. However, this participant acknowledged that while they did not see face-to-face interaction as a necessity, it is **"nice to have"**. More commonly, participants were concerned about a shift towards online learning, with one describing how a shift to complete online learning would be **"foolish"** (Scenario 3), and the potential wider implications for individuals' socialisation this may have. For many, the benefits of peer learning were thought to outweigh the advantages of online learning.

> **"In class you can bounce off each other and if you're stuck on something you can ask how they did it and it helps"** – *Northern Ireland (rural), Scenario 3.*

While participants were generally positive about the prospect of increased learning and development that advanced technology may facilitate, there was also a sense of caution around the practicality of this shift. Some participants expressed concern about whether future societies would have the knowledge and skills to fill an economy established on technology-based roles.

> **"It's a good thing if more jobs are being made but I worry if these jobs are surrounding cryptocurrency and tech, there will be a narrow variety of people available to do these jobs […]. I worry if we will have the amount of trained, skilled people to compete internationally."** – *England (urban), Scenario 3.*

Similarly, in scenario 4, which had a heavy reliance on local manufacturing, some participants challenged the idea that there would be enough skills and knowledge dispersed throughout the population to achieve this.

> **"The challenge will be to make things locally. I think we've lost a lot of skills within the country, and the machinery to make things."** – *Northern Ireland (rural), Scenario 4.*

Some participants also raised concerns for retailers in scenario 4. The economy of scenario 4 is based on a circular model, with a focus on repair and mend, perhaps meaning that retailers would not be able to sell as much and would likely need to shift their business model towards repair or second-hand. Most participants saw this challenge, and the shift it entailed, in a positive light, in line with their preference for an economy focused on minimising waste.

Relationships with technology

Looking beyond the impact of technology on jobs, participants also envisaged challenges in the relationships people may have with technology in the future. This was both in terms of the relationship society more widely may have with technology – for example, around reliance on certain systems or businesses – and in terms of individuals' relationships with technologies and the potential consequences of this. On the former, participants were concerned about what happens when the technology on which we rely goes wrong – if there were to be a power outage, would a society reliant on advanced technology collapse?

> **"It's worrying that we might become too reliant on it. Things do breakdown over time, so what if something is to go wrong with it?"** – *England (urban), Scenario 1.*

For some participants, there was an underlying worry that humans may lose control of technology in the higher technology scenarios. Technological advancements were seen as potentially positive, but these participants were emphatic that the transition to and use of advanced technologies needed to be approached cautiously. Participants expressed a consistent sense of distrust around technology being wielded inappropriately – this ranged from data security to AI 'going rogue'.

> **"No one has mentioned data security and confidentiality. What happens if data gets into the wrong hands?"** – *England (urban), Scenario 1.*

> **"I suspect that AI can be used in a nonbeneficial way but that's driven by the humans programming it. Perhaps time will tell, but I can't envisage an AI that will then make itself go rogue without there having been someone who's made that happen."** – *Northern Ireland (urban), Scenario 1.*

Another aspect of the relationship with technology that participants thought could be a challenge was the impact of technology on people's state of mind. Participants often expressed sadness when thinking about these implications of technology.

> **"[People] will be more disconnected and impersonal with their dealings, like detached robots. I find that really sad."** – *England (urban), Scenario 3.*

Some were worried about reliance on advanced technology resulting in apathy or civil unrest; others found the prospect of a small child growing up without knowledge of a life outside virtual reality in scenario 3 upsetting.

> **"I feel sorry for the little baby of this couple, as they will not know any other life than virtual reality."** – *Wales (semi-rural), Scenario 3*

Some participants also expressed concern about the physical health implications of over-reliance upon technology. Participants were informed that, as part of scenario 3, the population had become more sedentary due to spending increased time online; this aspect of the scenario was met negatively, with participants worried about, for example, the persona Jack, who had ADHD, and how people such as him would cope with staying indoors so much. Related to this was the aforementioned concern that over-reliance on technology would result in people becoming increasingly isolated and unable to have face-to-face interactions, leading to loneliness and potential mental health impacts.

> **"It seems that our focus has swayed from health to staying at home and using goggles."** – *Wales (rural), Scenario 3.*

> **"ADHD isn't a good thing to sit in the house with watching Facebook and TV. It's going to make Jack worse as well."** – *Wales (urban), Scenario 1.*

Digital inequality

Another challenge raised was around how technology may be accessible to different people in different ways. One participant, for example, noted that AI programming may result in certain biases towards certain groups.

> **"There's a lot of nuances that you cannot factor for, so that's the difficulty with replacing humans, and I hope it doesn't become a really heavy imbalance. You want to hold onto some of the humanity, because you can't disregard outliers, whether that's because of disability, race, cognition, economic reasons, social reasons, linguistics reasons."** – *England (urban), Scenario 1.*

For others, there was a sense that as society became more digital, there would be an increasing number of people being left behind by technological advances. Participants felt that the persona Ananya, who lives with Alzheimer's, would struggle a great deal, as would other older people. There was also a concern for those in less skilled jobs or who were less educated, who many participants felt would be the first to lose their jobs, whereas young people and those more highly educated or skilled my find it easier to adapt.

8 Food and land-use

Key findings

Participants were generally more open to moving towards a more plant-based diet, especially when thinking about the benefits for climate change and health. Some were very concerned, however, that a plant-based diet would not be enjoyable or satisfying, and even that humans were not meant to consume only plants.

Most were much less willing to consider a diet reliant on or including cultured food. Participants' concerns stemmed from a belief that these foods were likely to be less healthy than traditionally produced food. Many seemed to be basing these assumptions on a distaste for the concept itself, although some were willing to consider consuming these foods if they were confident in the safety checks to confirm their safety.

There was concern about the accessibility and affordability of the food that participants saw as more desirable or healthier. Participants tended to be more negative about scenarios where organic or 'natural' foods were more expensive or less readily available.

Participants were positive about food security and self-sufficiency, but were concerned about the practicalities behind achieving this, particularly when considering the public growing their own food.

Participants were concerned that rural areas would not be adequately considered in the future scenarios. Generally, they wanted land to be used efficiently, and for there to be adequate access to green spaces.

This chapter will explore participants' views on food production and land-use across the four scenarios. This relates to methods of producing food, imports and exports, impacts on agriculture and the type of food that people are consuming. Land-use entails discussions around farmland, natural areas and parks, and recreation versus use for economic purposes.

Participants sometimes interpreted the aspects relating to food products to their most logical extreme, envisioning worlds with higher adoption of plant-based diets as being worlds without any access to meat, which impacted how they viewed the worlds themselves.

8.1 Views on food and land use by scenario

Food and land use: scenario 1

Summary: *Increase in plant-based diets and cultured meat. Organically farmed meat is a rare luxury. Genome editing and robotics have reduced land and pesticide use. There is improved food self-sufficiency.*

In this scenario, participants were generally averse to the use of technologies in food production, particularly cultured meats and to a lesser extent, genome edited food. Participants raised concerns around long-term health implications of consuming foods they deemed 'unnatural', and around technology in food production creating a reliance on big corporations as the sole providers of certain food products. However, others saw some potential for reducing carbon footprints.

> **"As long as it's [genome edited food] proven to be safe, I can see it being a great medium to reduce carbon footprints and global hunger problems."** – *England (urban), Scenario 1.*

Whilst many participants were not against changes to societal behaviours and increases in plant-based diets, there were some who were reluctant to shift away from meat consumption. A few participants argued that diets with no animal products were not a natural diet for humans and may necessitate supplementation to avoid mental health or cognitive abilities suffering. Other concerns were raised about what would happen to existing cattle and other livestock.

There were also strong concerns that in this scenario, rural areas were forgotten about, and that the only land with value attributed to it was in urban areas. This concern was particularly strong amongst those from rural areas, but others from urban areas also expressed worries relating to this, as well as anxieties over losing access to natural spaces.

Food and land use: scenario 2

Summary: *Meat is readily available through intensive farming. Organic options are available but are unaffordable for most people. Some UK farmland has become unviable, meaning there is an increased reliance on imported food. There is little agricultural technology available.*

Participants generally saw scenario 2 as **"regressing rather than progressing"**, particularly with food production, the reliance on imports, and intensive farming. Participants also reacted very negatively to the cost of certain food items that were described in the materials and were concerned that organic food products were much more expensive than the alternative intensively farmed meats.

Participants were highly critical of this price difference, with many arguing that it meant those who earned less would have either to consume meat that was farmed in sub-optimal conditions, or to give up meat altogether.

> **"I like to be self-sufficient in what we grow, and a lot of the food currently does come from overseas, but the whole energy crisis now shows you that if you don't produce your own reserves, you're held captive by outside forces."** – *England (urban), Scenario 2.*

Participants were generally positive about rewilding and greater access to nature. However, they felt that this should not come at the cost of food production - a sentiment which was particularly prominent amongst rural participants. There were also some concerns about costs around upkeep for rewilded land.

Food and land use: scenario 3

Summary: *There is an increase in the availability and affordability of cultured meat. Urban agriculture and vertical farming offer local produce for those with higher incomes. Genome edited crops and robotic pollinations allowed the UK to maintain self-sufficiency. However, environmental degradation has reduced biodiversity.*

Participants expressed strong dislike for the high levels of genome edited and cultured foods in this scenario. Many were concerned about the health inequalities that might arise from those on lower incomes only being able to afford lab cultivated foods, whilst those on higher incomes enjoy what were seen as healthier, organic foods. Potential health implications of these foods were a greater concern than taste, although a few participants did say that the main reason they themselves would be against consuming them would be due to taste and personal preference.

> **"What would scare me is that they would try to present the food as if it wasn't lab grown. Would they try to pass it off as something else?"** – *England (urban), Scenario 3.*

Furthermore, some participants felt that individuals, particularly from certain cultures where eating meat is common or from the older generation who had eaten certain foods all their life, might struggle with significant dietary changes.

Novel methods of farming were also contentious, with some seeing vertical farming as the **"way to go"** and others seeing it as potentially allowing disease to spread, or suggesting that it is an unnatural process that would likely use a lot of insecticides and pesticides. However, some noted that the use of such chemicals is no different to how the food we eat now is produced.

Participants were quite concerned about the lack of nature in this scenario and the reduction in biodiversity, inferring, for instance, that the use of robotic pollination meant there were fewer bees. Participants drew upon the recent COVID-19 pandemic to highlight the importance of nature for mental health, and those from rural areas expressed sadness over the fact they felt the countryside had been forgotten.

Food and land use: scenario 4

Summary: *There is an increase in plant-based diets and lower meat consumption. Little agricultural technology is available. More food is grown in the UK for domestic consumption. There are protected nature zones and restored national parks.*

Participants were generally positive about the low availability of cultured or genome edited foods in this future scenario, and in general participants welcomed the shift to plant-based diets.

> **"I do eat meat, but I do like a plant-based diet. To me, it seems pretty good. I'm happy not to have the same choice as at the minute. I would survive."** – *Northern Ireland (rural), Scenario 4.*

However, concern around a lack of access to meat was also raised, with a few participants misinterpreting the scenario to mean that a societal shift to eating less meat actually entailed there being no meat available, a shift of which they were critical.

There was also some concern in Scenario 4 that the focus on organic and healthy eating could be at the detriment of 'convenience foods' which were seen as essential for individuals with busy lives. For example, it was felt that the personas Obafemi and Lisa who are both working adults with a six-month-old baby would **"struggle to cook healthy food every night when they're coming from work".** On the other hand, one participant felt that whilst some people might think they are too busy to cook, educating people in a **"very user-friendly way"** could help to overcome this.

Participants liked the idea that more food would be grown in the UK, particularly in the context of a crisis, and envisioned idyllic images of communities and families growing their food together. It was felt that growing more food in the UK and having more home-grown foods would lead to greater education around where food comes from, which was something participants liked. However, they were concerned about things that could not be grown in the UK due to weather, and the implications that this might have for their diet, as well as a few expressing concerns around food security.

There was some concern that protected nature zones would mean restricted access to nature and green spaces with implications for mental and physical health, although for most the emphasis on active travel and emphasis on low-carbon methods of transport was a positive.

8.2 Food and Land Use Themes

8.2.1 Participants highlighted the need to consider the implications of shifting towards more plant-based diets, and were often reluctant to change their current diets without good reason. Reasons that were more acceptable were around the climate implications of diets and sometimes health or resource efficiency.

As evidenced in the above discussion of each scenario, participants were keenly concerned around the potential health implications of changing diets. These concerns were heightened by participants often taking the most logical extreme potential as a given (for example, that *less* meat consumption meant *no* meat consumption). The envisaged health implications of dietary shifts were both mental and physical, and were, as noted in the cross-cutting themes section, often defined by how healthy participants inferred different foods and diets were. Some, for example, felt that meat was an essential for a 'balanced' diet.

> **"Sometimes diet can help and have an effect on conditions. Natural things can help with concentration, so I'm wondering if someone like Ash will have access to organic food. If I had a child with ADHD, I'd want the best diet and care they can get."** – *England (urban), Scenario 2.*

Some participants felt that no longer being able to eat certain foods that were once enjoyed might have negative ramifications for mental health. When considering the personas Obafemi and Lisa they also highlighted the parents' potential stress and anxiety if they were not able to feed their children the way they wanted (such as with organic, natural produce). There was some concern for the persona Ananya, due to feelings that people living with dementia require familiarity and uncertainty as to how someone like Ananya might handle change; indeed, participants felt that older generations as a whole would be particularly reluctant to shift their diets to being more plant-based.

> **"The over 50s will always struggle with change, humans don't like change." – *England (rural), Scenario 1.***

However, a few participants also said they would be very reluctant to make changes in their own diets. One of the reasons given for this was around taste and enjoyment of food, with some participants saying a plant-based diet would be less enjoyable than one containing meat. Similarly, a few also said that a diet with less variety, either due to reduced food imports or less access to meat, would be a negative.

> **"It feels like food would become more bland and sparse in terms of variety. I come from Caribbean descent. I can't imagine growing a pineapple in my backyard, or my local farmer down the road growing a pineapple. I like the variety and richness."** – *England (urban), Scenario 1*

> **"We're all entitled to our freedoms. You shouldn't have vegetarianism pushed upon you."** – *Wales (urban), Scenario 3*

However, some participants felt that this may not be such a big problem. One participant described the similarity between some existing meat-free alternatives and meat containing products.

> **"I'm a meat eater. I had a vegan sausage roll the other day, had they not told me, I'd have thought it was meat, I was amazed."** – *England (rural), Scenario 1*

Indeed, many participants spontaneously connected consuming less meat and animal products with being more sustainable, and so were more willing to change their diet on this basis. In this vein, there was a general sense that changes to diets in the future would be a case of "**getting used to it**"; it would be a shift for most, but not an unmanageable one. Indeed, some felt they would be happy with less

choice than they had now, tying this sometimes to sustainability and the climate implications of a diet focused on meat.

> **"I agree that reducing the amount of meat and meat production we have is going to be a benefit. Maybe not fully, but switching to organic, sustainable farming would be a better thing." –** *Scotland (rural), Scenario 1***.**

Genetically modified or cultured food products were seen as 'unnatural', which was perceived as inherently negative. Participants were generally extremely reluctant to consider changing their diets to incorporate these into them, even those who were otherwise happy to consume less meat. However, there were some positive aspects of new technologies that were identified, like improving nutritional profiles and promoting crop/livestock resilience.

For many participants, the notion of genome edited foods, cultured meat and crops farmed in urban, vertical farms were inherently negative. Most were reluctant to change their diets when it came to introducing food produced using these methods. There was a strong perception that these foods were inherently less healthy than their more 'naturally' farmed alternatives, and that the use of growth hormones or chemicals in their growth impacted how healthy they were.

> **"Processed food [discussing cultured meat] is never as good for you as the natural stuff."** *– England (urban), Scenario 2*

Generally, the sense that they were 'unnatural' or ''cultured' was seen to make them innately unhealthy in comparison to their alternatives. Some participants noted that the recency of genetic modification technologies meant that the long-term effects of these foods were potentially unknown.

> **"When you start messing around with food, I question the health implications of that."** *– England (urban), Scenario 1*

This is not to say that participants were entirely reluctant to change behaviours, with a few suggesting that, in time, they may grow to accept these foods by 2050; however, most were strongly convinced they would not.

> **"It looks like a horrifying scene to me. It looks like everything is GM. Nothing is natural. Our food is tampered in a lab […]. It's not something I'd want to eat." –** *England (urban), Scenario 4.*

For many, this dislike appeared to be due to an assumption about how cultured, or genome edited foods may taste. Even when asked about why participants were willing to consume other 'unnatural' products – such as medication or supplements – participants rarely changed their views.

Regarding the problems participants had with genetically modified food, one participant felt that they were likely related more to **"a feeling than knowledge"** *(Scenario 3)*, and that education could be used to overcome this. A few noted that their feelings were likely down to either not understanding or were a knee-jerk reaction. However, even with these caveats, participants' negative reactions were very strongly expressed, indicating that cultured or genetically modified foods are challenging concepts for people to accept.

> **"With regard to the GM crops and things, I don't really feel learned enough to have an opinion. My gut reaction is that I don't love it, however I feel if there is no other option then perhaps that is the better idea. When it comes to meat, it's a no from me."** – *Northern Ireland (rural), Scenario 3*

A few were sceptical, but said that if certain conditions around safety and testing of the foods was 'flawless', they would be willing to eat the food. This tended to be tied to sustainability, but these participants reiterated these climate outcomes should not be at the expense of human health.

Despite the general dislike for the genome editing of food, some participants identified some potential advantages for new technologies to create more resilient or fit-for-purpose products. Most of these were regarding genome edited plant crops, which tended to be less disliked by participants than cultured meats. Aside from producing animals with more available meat for consumption, crop-based benefits highlighted were around better-quality crops for feedstock, but also enabling crops to grow in less hospitable environments or produce higher yields. When thinking specifically about urban farming in scenario 1, another participant highlighted that the scenarios' emphasis on farming in urban environments would necessitate a level of genome editing to make producing food in that way feasible.

> **"With genome editing, you could get better stock so you have the same animals but more meat off them. You could get them to live in a harsher environment and crop better. With genome editing of crops, you could get different crops to feed the beasts or get a better yield by changing the balance of what they eat."** – *England (rural), Scenario 1.*

> **"One other advantage is with increased land for urban growth, maybe agricultural food production will be pushed into land that's less suitable, so gene editing could be more beneficial."** – *Northern Ireland (rural), Scenario 1.*

When considering the personas, one participant also suggested that genetic modification may allow for control of nutrient dosage in food and how this might be beneficial to help older people with potential decreasing appetites such as the personas Jack and Ananya.

More generally in farming, it was thought that new technologies might be able to help address labour shortages and that a reduction in pesticides would have advantages for nature and biodiversity. Some participants also discussed the environmental benefits, such a reduction in pollution and cleaner air, of self-sufficiency and home-grown produce.

> **"In agriculture, we currently use a lot of pesticides and chemicals, so reducing those could be positive for the natural world and biodiversity."** – *Northern Ireland (rural), Scenario 1.*

8.2.2 Accessibility and affordability of a variety of food was important to participants

Strongly related to the above two sections, participants were often critical of what they saw as potentially unequal access to healthy foods. As noted above, in most scenarios there was limited access to certain foodstuffs. In scenarios 1, 2 and 3, organic foods (both crops and livestock) were shown in materials as being more expensive than the alternative, which were cultured foods in scenarios 1 and 3, and imported produce and intensively farmed meat in scenario 2.

As highlighted when discussing each scenario, participants tended to be critical of this, arguing that this unequal access to foods that were more ethical or that participants perceived as healthier was unfair on those who were less well-off, and emblemised the inequality of potential health outcomes across the different scenarios. Some participants described how they would rather reduce their meat intake or stop meat consumption entirely than eat the cheaper intensively farmed meat or cultured meats.

> **"Lab grown meat is freely available so you can have that if you're poor, but the rich can still afford what I suspect we would all see as the healthier, more natural options."** *– Northern Ireland (urban), Scenario 3.*

In relation to this, participants disliked the lack of choice that may be associated with shifts in food availability more widely and to individuals. This could be based on cost, for example, or on availability of different types of food; for the latter, this was sometimes based on some participants' conception that less emphasis on certain food like meat meant *no* access to this food. Nonetheless, most participants generally felt that a reduction in meat could be a good thing, with the strong contingency that it was not forced upon people.

8.2.3 Participants viewed the idea of being self-sufficient with food, individually or as a community, very positively, with potential benefits for health, education and reduced inequality. However, they were concerned about the viability of this.

Participants often noted the positives of growing foods in local communities and consuming seasonal produce, particularly in relation to scenarios 2 and 4. Most were positive about the possibility that more people growing food would provide an education for children on sourcing, growing and cooking food. Furthermore, based on concerns about pesticides for human health, one participant highlighted that a positive of growing your own food is knowing what is in the soil. This suggestion formed part of wider concerns about the health implications of less natural foods.

> **"It looks like it's going back to basics of farming, growing your own food, which I like the idea of because I feel I have too many takeaways and having access to too many delivery companies we need to start teaching children to grow their own food."** – *England (urban), Scenario 2.*

Some participants also felt that the notion of people growing their own food could help balance income inequalities. Rather than those on lower incomes only having access to poorer quality food, if they were able to grow their own, they would have access to cheap and likely organic produce.

Participants were negative about the reliance on imports in scenario 2, noting a desire for self-sufficiency and food security – made particularly salient in the context of the current energy crisis and conflict in Europe that were occurring at the time of fieldwork. They were also generally critical of the reliance of large, factory farms in this scenario to provide affordable meat, preferring instead meat reared in what was seen as a responsible way in small-hold farms, such as in scenario 4. For some, there was a sense they would happily consume less meat that was more expensive if it had been reared in this way.

However, there were some concerns about wholly relying on home-grown, seasonal food in the future. Some participants raised strong worries that this would be a challenge in the context of climate change and the increased frequency and disruptiveness of extreme weather events. Some were also concerned about who would *not* benefit from growing their own food. There were those who participants felt would not be able to do so – for example, the elderly personas Jack, with limited mobility, and Ananya, living with Alzheimer's – as well as the simple fact that there may not be enough people with the right skills to enable this. Participants also highlighted that there would likely be regional differences in the ability to grow food, resulting in some areas struggling to do so.

> **"The idea that we're going to get a fully balanced diet in the Scottish Highlands or Wales is wrong, we're just going to get rickets."** – *Wales (rural), Scenario 4.*

> **"If it's getting worse, what about flooding, strong winds, or up in Scotland in the winter it's very cold and you can't grow anything. This is all because of climate change, and summer is very hot in the South, nothing will grow. That's a concern for me about climate change."** – *England (urban), Scenario 4.*

Food security and self-sufficiency was, in some scenarios, realised through urban food production. While some participants liked this idea, others had concerns, even if these methods were a viable option for food security in the UK. Some highlighted challenges around air quality in urban environments, and a lack of land for growing food.

> **"I thought of all the toxicity in London, and growing it in my backyard, I don't know. The thought of all the fumes and toxicity. I know we're projected to 2050, but I still think there will be a large amount of toxicity."** – *England (urban), Scenario 1.*

Some participants posited that having plants packed together so densely in vertical farms may result in spreading disease and that a lack of naturally occurring plants (those that have been genetically modified) may lead to a lack of biodiversity. Some participants pointed to the idea of robotic pollination, highlighted in the materials in scenario 1, and inferred that its use likely means a decline in bee populations. A few participants also highlighted the need to maintain the **"identity"** associated with farming, with concerns that new methods of farming may result in automation of farmers' jobs, and a loss of traditional farming techniques.

There was also a strong sentiment that new farming and food-rearing technologies should not be a 'cash cow' or a money-making scheme for big businesses and a few individuals. One participant disliked the fact that the involvement of technology in farming may lead to big businesses to have the monopoly on growing food, rather than farmers growing it as is the case currently. This was based on the idea that where food is genetically modified, it often cannot reproduce, so whoever owns the patent to it owns the ability to produce it.

A few participants also highlighted that if there was an energy crisis similar to now, this would put a strain on agricultural systems reliant on technology rather than manual labour in farms.

> **"If there's another energy crisis, think about all the energy being used to run these farms as opposed to manpower, everything uses a vehicle or robotic pollination."** – *Scotland (rural), Scenario 3.*

8.2.4 Participants were keen for efficient land use, which also provided access to green spaces. There were overall positive views on rewilding, but participants highlighted the need to balance this with farming needs.

Many participants saw rewilding as a positive thing that would restore landscapes back to their natural state. One participant described opportunities that may arise from rewilded land, such as foraging for mushrooms or berries. This was particularly the case in scenarios 2, where lots of land had been rewilded, and scenario 4.

> **"It's putting things back into the way nature intended it to be."** – *England (urban), Scenario 2.*

Participants expressed similar feelings when it came to protected areas, feeling that it would allow biodiversity to flourish again.

When discussing land-use, participants highlighted the importance of access to nature for positive mental and physical health. They felt natural spaces, access to them, and rural areas including farmland, should be protected and more highly prioritised in the scenarios. Participants often felt that the countryside had been forgotten about in all scenarios, particularly those not focused on rewilding or improving the natural world, with focus instead placed on advanced technologies and urban areas.

> **"For your own physical and mental health, I think that's good, and having access to nature is good, where a lot of people right now don't."** – *England (rural), Scenario 4.*

Despite the positives associated with rewilding, some participants recognised that protecting nature through processes like rewilding should not be to the detriment of food production, with some questioning the purpose of rewilded land. Participants from a rural background in particular expressed concerns over rewilding and farmers' abilities to grow food in the future. The potential for this to create greater reliance on imports and the negative impacts of this for the environment was also highlighted.

> **"If we're restoring nature to its naturalness, where are we getting the food from?" –** *Wales (rural), Scenario 4*

> **"I'm all for protecting the rural environment but the whole point of agriculture is making the countryside a productive space."** – *Wales (rural), Scenario 2.*

One participant highlighted that rewilded land is not something that can be left alone and needs to be managed, which is something that is neither easy nor cheap. Another felt that it would take a long time to re-establish the ecosystem that is desired.

> **"There's an idea that if we stop ploughing fields, we'll get golden eagles again. Most farmers will tell you that if you leave farmland alone, it will become a wasteland with no animals there. I'm not sure of what the benefit would be if we had a huge patch of brambles out there randomly."** – *Wales (rural), Scenario 1.*

The split between the desire to rewild and the need to farm was picked up on by participants, with the suggestion that this point of contention would likely exist beyond the context of the workshop and lead to real-life tensions in 2050.

Participants were also often critical of what they saw as poor land use, particularly in urban areas. There was a sense of frustration in scenarios 2 and 4 that urban spaces were not being used in the right ways. In particular, when discussing scenario 2, participants noted the large amounts of buildings and spaces that had fallen into disrepair, suggesting it would be a better use of land to repurpose them.

> **"I would echo everyone's sentiments about city centres becoming derelict. It seems like a waste of space. It would make more sense to repurpose the city centres."** – *Northern Ireland (urban), Scenario 2*

9 Civic life

Key findings

Participants consistently emphasised the importance of community in the future, and were concerned that, where they saw the maintenance of strong communities as being challenging, there may be civil unrest.

Participants tended to be more positive about aspects of civic life that facilitated either easier engagement, or local politics.

Where there was less trust in institutions and the agency of individuals, there was lower civic engagement.

Civic life as a topic was only specifically discussed in workshop 5, but all four scenarios had at least one artefact that alluded to how citizens may engage in various aspects of civic life (see **3.3** for explanation on artefacts). Participants' views were often strongly tempered by their own experiences and views of civic life. For most participants, there was a strong feeling of distrust and wariness over the general machinations of power. Participants pointed often to 'the government', 'big companies', or 'elites' as those in positions of power, but references to more specific entities were rare, indicating a generalised feeling of distrust, rather than one focused on, for example, the government in power at the time of the workshops. There were also some participants who were simply unengaged in civic life today and noted that they would likely behave in the same way in 2050.

> **"[My engagement in civic life] depends if it would have any impact for me. Sometimes they're going to do what they want anyway. You can collect as much data as you want, but it's the powers that be." –** *England (urban), Workshop 5.*

9.1 Views on civic life by scenario

Civic life: scenario 1

The artefact for scenario 1 was a flyer for a debate between an influencer and a CEO of a big technology company. The focus of the debate was whether AI should be allowed to make society's big decisions on resource efficiency. This referred to the use of AI in this future scenario to track resource use, where resources are in their lifecycle, and potentially make decisions on availability of certain resources based on this tracking. Generally, participants were quite open to the idea of the live debate, feeling it enabled direct participation.

> **"I'm all for live debates. If it shows some sort of partnership and willingness on their parts to engage with the rest of society, that can only be a good thing."** *– England (urban), Workshop 5*

However, the content of the debate and the stated affiliations of the two debaters were a cause for concern for some participants. A few participants rejected the premise

of the debate outright, while others questioned the possible objectivity of the debate given the reliance of both parties on technology to make money.

> **"I just worry that in the future, it seems like a really big debate to have with people who might be quite biased […]. It's two people that are profiteering from that business."** – *Scotland (rural), Scenario 1*

Civic life: scenario 2

As previously noted, scenario 2 was challenging for participants, and a few envisioned the potential for social unrest or a breakdown of social cohesion. The artefact for this scenario was a flyer for 'The New Resisters', a group that advocates for limiting the influence of technology. Some participants identified with this movement, feeling that the values were in line with their own scepticism around AI and technology.

> **"I think I would be one of the New Resisters because I think AI is taking over too much these days. They want to control you whoever you are and whatever you do."** – *Wales (semi-rural), Workshop 5*

However, there were still questions around the movement. The few participants who were less sceptical around the role of AI in society, for example, were more critical of the party's anti-technology stance.

Civic life: scenario 3

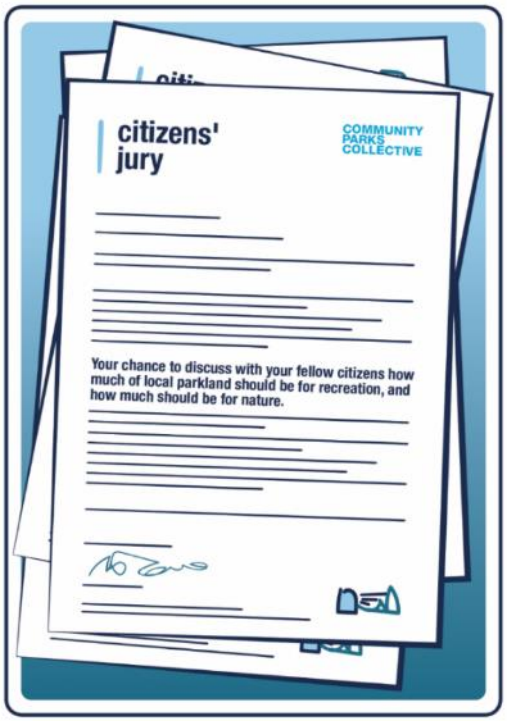
The artefact for this scenario was an advert, encouraging online voting for a resident's association. Participants were generally favourable towards having the option to vote online – for some, it seemed a natural progression and would enable those currently unable to vote in person to engage in civic life. There was some concern, however, that online voting could be subject to cheating. The participants who mentioned this wanted to make sure it was safely secured.

> **"I think the online voting would be better. I don't like queueing up at the polling station. I think it would be better as long as it's well secured."** – *Scotland (rural), Workshop 5*

Similar to scenario 2, participants were more cynical about the state of civic society in this scenario, and with some noting that social unrest may be possible in this future too, given the physical

division between the 'haves' and the 'have-nots'. Some participants feared that the heavy reliance on AI and VR in everyday lives was a means of dividing people, which would in turn generate distrust, but also an apathy about producing change.

> **"They will have less sense of agency because it's already keyed in and decided how it's going to go. That could lead to despondency."** – *England (urban), Scenario 3.*



Civic life: scenario 4

Most participants were positive about the emphasis on local politics and communities in this scenario. The localisation and de-centralisation of decision-making was also seen as a positive. In engaging with the artefacts from these scenarios, participants deliberated about an invitation to a citizens' jury around the use of local parkland. When discussing this political artefact, most participants focused on and appreciated the method of engagement.

> **"A citizen jury is good as well, to have your say. It's always good to debate what's going to happen in your area."** – *Wales (urban), Workshop 5*

However, some participants – including some from Northern Ireland – expressed scepticism around whether citizens' juries would work in practice, given the contextual divisiveness in national politics. Others, who were more critical of the role of and influence of government, were unconvinced that the engagement would influence decision making, whilst others doubted the effectiveness of local engagement in general.

9.2 Civic life themes

Participants' comments on civic life across all four scenarios fell into several key themes. These themes are explored below, with reference to the challenges and advantages participants saw, as well as the trade-offs and opportunities they raised.

9.2.1 Sense of community is important and where this is eroded, there could be civil unrest

Through most of the scenarios, participants tended to emphasise the importance of community in encouraging civic engagement and a healthy political life. Where community-building was facilitated – most notably in scenario 4 – participants were more positive about their own engagement in civic life and that of society more widely. Some participants did highlight the need for the government to encourage people to engage in civic life more.

> **"[The citizen's jury] looks like you can make a difference. You're getting engaged with your local community […]. When you're living in bubbles or gated communities, a citizens' jury could bring people together."** – *Wales (urban), Workshop 5*

In contrast, some participants were concerned about the potential for social unrest in scenarios where they envisioned the erosion of engagement in civic life, either due to a lack of community infrastructure (in scenario 3) or because of a struggling economy (in scenario 2). In both, the sense that the wealthy were in some way physically separated from the less well-off was seen as a potential flashpoint, raising the risk of spiralling criminality, particularly in urban areas. For scenario 2, a few participants were

concerned that crime would increase due to the removal of funding for social programmes and a more disparate population, damaging trust in the government.

> **"[Gated communities] seems like a primer for social unrest unless you're affluent and protected from what real life is like for the majority of the population."** – *Northern Ireland (urban), Scenario 3*
> **"They've closed down libraries and youth clubs and it's caused a rise in low-level crime. People don't feel engaged in their community or life itself."** – *England (rural), Scenario 1.*

9.2.2 Civic engagement is low when people do not trust each other or institutions

Some participants expressed feeling significant distrust in institutions now, and envisioned this being worsened in the future scenarios, in particular scenarios 2 and 3, due to division and atomisation. This ranged from a general scepticism that local politics, particularly in scenario 4, could or would work, through to a few participants suggesting that there would be civil unrest in some scenarios. Many participants also felt that their current disconnection with politics meant that they struggled to engage with visions for the future of civic engagement. This challenge, and participants' focus on it, was exacerbated in scenarios where there was greater income inequality, and particularly in scenarios 2 and 3 where this inequality was compounded by a geographic separation between the 'haves' and the 'have-nots'.

> **"It's either that [despondency or apathy] or civil unrest. This is the industrial revolution. You're either going to get apathy or Luddites."** – *Wales (rural), Scenario 3.*

For some, there was a slight sense of despondency over the state of politics and civic life, both today and in the future. These participants felt that power does not really sit in the hands of the people; a few were even worried this was the case in scenario 4, which was the scenario with the highest overall trust and engagement in politics.

> **"How do you make them accountable? If we're going to have these citizens' juries, panels, how do we hold them accountable for the decisions made by the masses?"** – *England (urban), Workshop 5*

10 Conclusions

Participants articulated considered and thoughtful views about a range of cross cutting themes:

1. **Technology:** Participants expressed nuanced views on the role of technology in the future, in particular regarding technologies that sought to decarbonise or reduce emissions. Looking ahead to 2050, many participants expected technological progress and innovation, but also expected certain conditions for those innovations to be acceptable. Many participants expressed concern about relying disproportionately on technology to reduce emissions and some expressed scepticism about the feasibility of technologies reducing emissions. However, they also saw some benefits, relating to potential positive health outcomes and convenience, from effective use of technologies.

2. **Equality:** Participants expressed concern about pathways that might generate or perpetuate inequalities. Some of the inequalities discussed most prominently included impacts on income inequality and socio-economic inequality, place-based inequality (most notably between rural and urban locations), health inequalities, and intergenerational inequalities. There was a strong focus on the importance of a just and fair transition, with participants indicating that people and communities should not be 'left behind' in the efforts to make progress on reducing emissions.

3. **Health:**  Participants expressed concern that some efforts to reduce emissions or decarbonise might result in inadvertent or unequal health outcomes. This issue was most prominent in relation to discussions about food production and land use and technologies, where some participants felt that changes to how people consume food, or changes to how people socialise, mediated by technologies would disproportionately impact mental and physical health. They advocated for approaches that sought to optimise both climate and health benefits.

4. **Involvement:** A strong theme that surfaced was the importance of self-determination and societal determination in navigating pathways to net zero. Participants felt that informed individual and collective involvement was central, securing an approach to societal change that was consultative and collaborative, working with diverse stakeholders and perspectives. Participants also felt that the trustworthiness of, and their trust in, the institutions responsible for guiding the UK towards lower emissions, was a central condition that enabled this sense of agency. Participants noted that trust and confidence in organisations such as government agencies, political parties, and commercial organisations (particularly technology companies) would be an important factor in how people perceived leadership when it came to behavioural and social change. They also expressed preference for more devolved and local consultation and decision making, given the differing experiences and expectations of communities across the UK.

5. **Balance between circular economy and innovation:** Whilst participants indicated they expected continued innovation and growth, they appreciated and valued features of the 'circular economy' such as 'repair, reuse and recycle', and the values of collective responsibility that these features engendered. However, they also indicated that

they expected continued innovation and growth. They expressed preference for a balanced approach that maintained consumer choice while also improving sustainability.

Some issues divided public opinion – and some participants felt more comfortable with some trade-offs than others. By way of example – the short-term trade-off between reducing emissions and convenience through travel (aviation and driving) was a key concern for some participants – particularly those on lower incomes and those living in rural areas. More broadly, other societal changes were more controversial than others for social, cultural and ethical reasons. For instance, approaches to reducing meat consumption, particularly where it included the use of novel food technologies was a particularly divisive issue, whereas changes in energy production, for instance, did not generate controversy.

The dialogue explored a wide-ranging set of issues through the lens of the four scenarios, which meant that it was inevitable that the full nuance underpinning the sectors could not be fully explored. There is scope, therefore, for more focused and further follow-on work on how specific elements of net zero futures can be realised. Beyond the findings of the dialogue, this particular deliberation used innovative, creative and participatory futures techniques that invited participants to immerse themselves into a wide range of different 2050 futures. The quality, depth and nuance of the discussion illustrates the potential these approaches and techniques have in supporting the public and policymakers in looking forward to the future.

Annex

Annex A

Sample framework & achieved numbers (see the FM profile sheets)

Gender		Age		Location		Housing		Concern about climate change		
Male	**Female**	**Average age**	**Age range**	**Rural**	**Urban**	**Own**	**Rent**	**Very**	**Fairly**	**Low**
44.1%	55.9%	43	18 - 71	47.1%	52.9%	52.9%	47.1%	44.1%	41.2%	14.7%

Demographic	**Target quotas**[13]
Gender	Male: 13 Female: 16
Age	16-24: 4 25-44: 10 45-64: 8 65+: 4

[13] In order to reduce difficulties while recruiting due to the small total sample size (30 participants, plus 5 stand-bys), we are using quota ranges to ensure each group is adequately represented, but also to allow some flexibility when sampling.

Household income	<£29,999: 14 £30,000-£59,999: 14 £60,000+: 5
Urban/rural and nation of the UK:	Rural/Market town: 15 Urban: 18
Opinions on climate change	Very/fairly concerned: 28 Not very/not at all concerned: 5
Self-described attitude to technology adoption	- Innovators / Early adopters / Mostly early: 23[14] - Late majority / Self-described laggards: 13
Political / trust attitudes	Variances in feelings about government intervention *To what extent do you agree with the following statement: "The government should play an active role in shaping our economy and our society."* *Ranging from strongly agree to strongly disagree.* Strongly agree / agree: 29

[14] These are discrete categories in the technology adoption lifecycle. We have combined them here for two reasons. Firstly, individuals in each category tend to have similar characteristics (tending to be wealthier, younger, less risk-averse and tend to be 'opinion leaders' than other categories). Secondly, and with the first point in mind, to help simplify quotas for this small sample.

	Strongly disagree / disagree: 1 Neither: 3

Annex B

Materials used in the dialogue

Scenarios

Scenario 1 (discussed in workshop 1)

Scenario 2 (discussed in workshop 2)

Scenario 3 (discussed in workshop 4)

Scenario 4 (discussed in workshop 3)

Artefacts

Scenario 1 artefacts

Scenario 2 artefacts

Scenario 3 artefacts

Scenario 4 artefacts

Personas

ANANYA

ANANYA (Asian British) is a retired doctor in her 90s. She lives with Alzheimer's disease and receives substantial social care.

TOM & PRISHA

TOM (White British) and **PRISHA** (Asian British) are a married couple in their 60s. Tom is a lawyer, Prisha is a doctor and together they have two adult children.

CHLOE & EMILY

CHLOE and **EMILY** (White British) are a couple in their 50s. They're both trained in skilled trades, Chloe as an electrician and Emily as a plumber.

Our standards and accreditations

Ipsos' standards and accreditations provide our clients with the peace of mind that they can always depend on us to deliver reliable, sustainable findings. Our focus on quality and continuous improvement means we have embedded a "right first time" approach throughout our organisation.

ISO 20252

This is the international market research specific standard that supersedes BS 7911/MRQSA and incorporates IQCS (Interviewer Quality Control Scheme). It covers the five stages of a Market Research project. Ipsos was the first company in the world to gain this accreditation.

Market Research Society (MRS) Company Partnership

By being an MRS Company Partner, Ipsos endorses and supports the core MRS brand values of professionalism, research excellence and business effectiveness, and commits to comply with the MRS Code of Conduct throughout the organisation. We were the first company to sign up to the requirements and self-regulation of the MRS Code. More than 350 companies have followed our lead.

ISO 9001

This is the international general company standard with a focus on continual improvement through quality management systems. In 1994, we became one of the early adopters of the ISO 9001 business standard.

ISO 27001

This is the international standard for information security, designed to ensure the selection of adequate and proportionate security controls. Ipsos was the first research company in the UK to be awarded this in August 2008.

The UK General Data Protection Regulation (GDPR) and the UK Data Protection Act (DPA) 2018

Ipsos is required to comply with the UK GDPR and the UK DPA. It covers the processing of personal data and the protection of privacy.

HMG Cyber Essentials

This is a government-backed scheme and a key deliverable of the UK's National Cyber Security Programme. Ipsos was assessment-validated for Cyber Essentials certification in 2016. Cyber Essentials defines a set of controls which, when properly implemented, provide organisations with basic protection from the most prevalent forms of threat coming from the internet.

Fair Data

Ipsos is signed up as a "Fair Data" company, agreeing to adhere to 10 core principles. The principles support and complement other standards such as ISOs, and the requirements of Data Protection legislation.

For more information

3 Thomas More Square
London
E1W 1YW

t: +44 (0)20 3059 5000

www.ipsos.com/en-uk
http://twitter.com/IpsosUK

About Ipsos Public Affairs

Ipsos Public Affairs works closely with national governments, local public services and the not-for-profit sector. Its c.200 research staff focus on public service and policy issues. Each has expertise in a particular part of the public sector, ensuring we have a detailed understanding of specific sectors and policy challenges. Combined with our methods and communications expertise, this helps ensure that our research makes a difference for decision makers and communities.