OECD Studies on Environmental Policy and Household Behaviour

How Green is Household Behaviour?

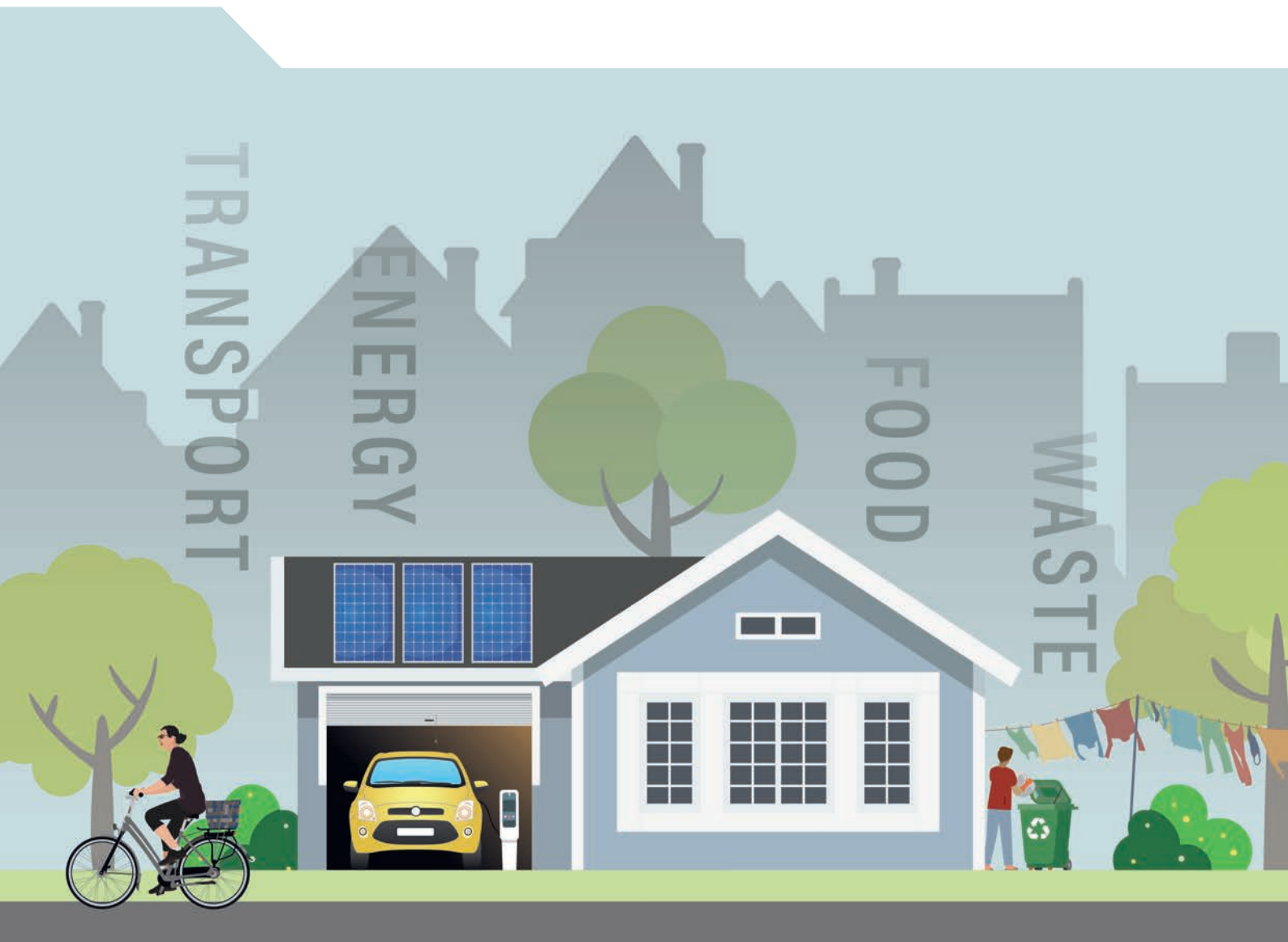## SUSTAINABLE CHOICES IN A TIME OF INTERLOCKING CRISES

OECD

OECD Studies on Environmental Policy and Household Behaviour

How Green is Household Behaviour?

SUSTAINABLE CHOICES IN A TIME OF INTERLOCKING CRISES

OECD

BETTER POLICIES FOR BETTER LIVES

This work is published under the responsibility of the Secretary-General of the OECD. The opinions expressed and arguments employed herein do not necessarily reflect the official views of the Member countries of the OECD.

This document, as well as any data and map included herein, are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Preface

Virtually all household choices – ranging from daily routines, such as what to eat and how to get to work, to less frequent decisions, like how to heat our homes and whether to buy a car – affect the climate and the environment. While the potential for individual and household choices to reduce environmental impacts is clear, the increasing urgency of climate change and other environmental crises illustrates the challenge governments face in fulfilling this potential.

In 2022, the OECD undertook the third round of the Survey on Environmental Policies and Individual Behaviour Change (EPIC), building on previous rounds in 2008 and 2011. This third round came at a time of interlocking global crises, including the COVID-19 pandemic, geo-political tensions and tumultuous energy and commodity markets. Concurrently, the urgency of action to address climate change and broader environmental challenges underlines the importance of an enhanced understanding of household behaviour and the barriers to making more sustainable choices. With comparable data on household environmental behaviour across nine countries and four thematic areas (energy use, transport, waste practices and food consumption), the EPIC Survey provides unique insights into the drivers of these choices and the measures governments can put in place to overcome the barriers identified.

This report, *How Green is Household Behaviour? Sustainable Choices in a Time of Interlocking Crises*, provides an overview of the results from the 2022 survey. It highlights the importance of making environmentally sustainable choices available and achievable for consumers. This includes, for example, options for households to choose renewably generated electricity or to easily charge electric vehicle batteries. Equally, it is important to ensure that the more environmentally sustainable alternatives are not just confined to some segments of the population, such as higher-income households, homeowners and those living in detached housing, but also for lower-income households, tenants and those living in apartment buildings. The reported high levels of support for many types of policies should be leveraged to advance environmental objectives.

The report provides an important point of departure for pursuing future work to examine the drivers of individual choices and the role of economic and policy conditions in supporting behaviour change. It is my hope that the findings presented in this report will serve as a key reference for policy makers as they develop and implement policies and infrastructure that will enable more sustainable consumer choices.

Jo Tyndall

Director

OECD – Environment Directorate

Foreword

This report provides an overview of the third round of the OECD Environmental Policies and Individual Behaviour Change (EPIC) Survey. It was implemented in 2022, following similar surveys in 2008 and 2011. The survey records attitudes and behaviour related to the four areas considered in the survey: energy use, transport, waste practices and food consumption. Further, it records the socioeconomic characteristics of respondents and households, as well as the characteristics of their residence and residential location. It also includes questions that focus on the policy factors influencing household behaviour, such as the use of economic incentives (e.g. waste charges, subsidies for investing in energy efficiency equipment) or information (e.g. energy efficiency of appliances, organic food). As such, the report provides unique insights into households' knowledge and perceptions about environmental issues and their reported actions and barriers to making more sustainable choices.

While emphasis has been on allowing for comparability across the three rounds of the survey, refinements to a number of questions were needed in order to reflect developments that have taken place since the last round was implemented in 2011. Examples include technological innovations that have altered the landscape of possible options for consumers, impacts arising from the COVID-19 pandemic, and increased policy interest in some topics (e.g. food waste).

A novelty of the third round of the EPIC Survey is the inclusion of discrete choice experiments in each of the four thematic areas covered. The discrete choice experiments ask respondents to make hypothetical choices between different policy measures by selecting a preferred alternative from a menu of options, which will be analysed in subsequent work. The full survey is available in Annex A.

Acknowledgements

Table of contents

FIGURES

TABLES

BOXES

Follow OECD Publications on:

https://twitter.com/OECD

https://www.facebook.com/theOECD

https://www.linkedin.com/company/organisation-eco-cooperation-development-organisation-cooperation-developpement-eco/

https://www.youtube.com/user/OECDiLibrary

https://www.oecd.org/newsletters/

This book has...

StatLinks 🛜

A service that delivers Excel® files from the printed page!

Look for the *StatLink* 🛜 at the bottom of the tables or graphs in this book. To download the matching Excel® spreadsheet, just type the link into your Internet browser or click on the link from the digital version.

Executive Summary

The choices households make affect the climate and the environment in numerous ways, ranging from daily habits, such as what to eat and how to get to work, to less frequent choices, such as how to heat their homes. The potential to reduce the environmental impacts of household consumption is well documented but has proven difficult to realise. Understanding and overcoming the barriers to behaviour change must be a policy priority given the urgent need to accelerate action to limit climate change and improve environmental quality.

This report presents insights from the third round of the OECD Survey on Environmental Policies and Individual Behaviour Change (EPIC), which explores what drives household behaviour and how policies may affect household decisions. Following two previous rounds of the survey in 2008 and 2011, a third round was implemented in 2022. With a sample of more than 17 000 households, the third round comprises nine countries: Belgium, Canada, Israel, France, the Netherlands, Sweden, Switzerland, the United Kingdom and the United States. It explores four key areas: energy, transport, waste and food systems.

Since the second EPIC Survey in 2011, environmental issues have risen up policy agendas, with milestones including the adoption of the Paris Agreement on Climate Change (2015) and the Global Biodiversity Framework (2022), and a resolution to reach agreement on an internationally legally binding instrument to end plastic pollution. Technological innovations have also altered the landscape of consumption options. Over the last decade the cost of renewably sourced electricity has declined rapidly, making it less expensive than fossil fuel-generated electricity in many countries. Drastic changes have also occurred in transport systems, such as the increased availability and affordability of electric vehicles. Digitalisation has facilitated new business models, many of which are associated with environmental benefits, such as reducing food waste and enabling peer-to-peer sharing of goods.

Societies and economies have also been significantly affected by the COVID-19 pandemic, geo-political tensions, and the associated energy and commodity crises. These diverse pressures and developments warrant a careful examination of the drivers of consumption choices and support for policy measures at a time of interlocking global crises. The 2022 EPIC Survey yields numerous insights.

Key findings

- **Energy use**: Households are more likely to practise easily adopted energy-saving actions, such as turning off the lights when leaving a room (92% of respondents), than actions that are harder to adopt or could reduce comfort, such as minimising the use of heating or cooling (68%). Uptake of renewable energy and low-emissions energy technologies is not widespread, even when these options are available. Among households for whom installation is possible, less than one-third have installed solar panels (29%), heat pumps (30%) and battery storage (27%). Uptake is particularly low for technologies that are costly or not well-understood.

- **Transport**: Although 50% of commuters in urban areas walk, cycle or take public transport to work, households still rely heavily on private motorised vehicles, which accounts for the remaining 50% of commuter travel in urban areas. Overall, 75% of households report that at least one household

member uses a car on a regular basis. However, more than half of regular car users (54%) indicate that improved public transport, such as cheaper, more frequent and more widespread services, would encourage them to drive less. The overall high reliance on private cars in all countries highlights the potential for electric cars in decarbonising the transport sector. A barrier to their uptake appears to be a lack of charging infrastructure: 33% of respondents report that there are no charging stations within three kilometres of their residence.

- **Waste practices**: Many households act to reduce waste by using reusable shopping bags (83%), but fewer buy second-hand items (37%) or rent items (20%). Households with drop-off services or services that collect recyclable waste at their residence produce on average 26% and 42% less mixed (i.e. non-recyclable) waste than households without these services. Households charged for mixed waste report composting 55% of their food waste, while those that are not charged report composting 35% of their food waste. Up to 16% of households report disposing of electric and electronic waste along with mixed waste.

- **Food consumption**: Affordability (64%), taste (61%), freshness (60%) and nutritional value (54%) are respondents' top priorities when making food purchases. The environmental impacts of food products are less important, even for the environmentally concerned. Across countries, 24% of households consume red meat several times a week. Less than half of respondents indicate that they would be willing to substitute conventional meat with a lab-grown alternative, and express reservations about its health impacts.

Policy implications

Overall, availability, affordability and convenience are key incentives in household decision making. Policies to promote environmentally sustainable choices should therefore seek to remove barriers to making sustainable choices. Survey results point to a number of policy priorities:

- **Make sustainable choices available and feasible.** Key bottlenecks to sustainable behaviour include a lack of availability and awareness, such as of renewably generated electricity options or charging stations for electric vehicles, as well as feasibility, such as solar panels for tenants or solar energy options (e.g. community solar) for those living in apartment buildings.

- **Provide incentives that promote sustainable choices.** Affordability and convenience are important factors for encouraging sustainable choices, especially around transport and food. Income and environmental concern are important factors in many household decisions, but environmental concern alone does not appear to be enough to change certain behaviours, such as in the case of eating red meat or using a car, when alternative modes are feasible.

- **Leverage existing public support to advance environmental policies**. Respondents systematically express less support for taxes and fees than for measures that make sustainable alternatives more affordable, such as subsidies. Policy complementarity is an important consideration, as households' acceptance of and ability to respond to tax-based measures depends on the alternatives available to changing their behaviour. In addition to providing sustainable alternatives, complementary policies to taxes and fees include a recycling of the revenues generated (e.g. to fund improvements in public transport).

- **Bundle incentives to maximise impact.** Certain environmental behaviours go hand in hand. Complementary incentives can reward environmental action in one domain by providing incentives for action in another domain. For example, those who shop with reusable containers could receive discounts on sustainable food items.

The high levels of support expressed for measures such as improving public transport services and stricter regulations on farming, should empower policymakers to take action to induce shifts to more sustainable consumption.

1 Household behaviour and the environment: Key findings and policy implications

The third OECD Survey on Environmental Policies and Individual Behaviour Change (EPIC) explores households' environmental attitudes and actions in the areas of energy, transport, waste and food systems across nine OECD countries. This overview chapter presents the main findings, including insights into the current state of public opinion on these environmental issues. It draws out implications for policy support – especially in creating the enabling conditions for promoting behavioural change.

Key messages

The third round of the OECD Survey on Environmental Policies and Individual Behaviour Change (EPIC) was implemented in 2022. The EPIC Survey explores household decisions related to energy, transport, waste and food systems and covers over 17 000 households in nine countries. This chapter presents an overview of the key observations arising from the data:

- **Energy use**: Respondents are more likely to practise easily adopted energy-saving actions, such as turning off the lights when leaving a room (92% of respondents), than actions that are harder to adopt or could reduce comfort, behaviours such as minimising the use of heating or cooling (68%). Uptake of renewable energy and low emissions energy technologies is more limited, even when these options are available. Among households for whom installation is possible, less than one-third have installed heat pumps (30%), solar panels (29%) and battery storage (27%). Uptake is particularly low for technologies that are costly or not well-understood.

- **Transport**: While reliance on cars is higher in rural areas, car use is still significant even in urban areas where it accounts for 50% of commuter travel. The highest reliance on private cars for urban commuting is in the United States (65%), Canada (56%) and Israel (56%). Overall, 75% of households report that at least one household member uses a car on a regular basis. However, more than half (54%) indicate that improved public transport, i.e. cheaper, more frequent and more widespread services, would encourage them to drive a car less. The high reliance on private cars in all countries highlights the potential for electric cars in decarbonising the transport sector. A reported barrier to their uptake appears to be a lack of charging infrastructure: 33% of respondents report that there are no charging stations within three kilometres of their residence.

- **Waste practices**: Households act to reduce waste by engaging in low-effort activities, but struggle to change their consumption habits. For example, many households use reusable shopping bags (83%), but fewer buy second-hand items (37%) or rent items rather than buying them (22%). Households with drop-off services or services that collect recyclable waste at their residence produce on average 26% and 42% less mixed (i.e. non-recyclable) waste than households without these services. Households that are charged for mixed waste disposal report composting 55% of their food waste, while those that are not charged report composting 35% their food waste. Up to 16% of households report disposing of electric and electronic waste along with mixed waste.

- **Food consumption**: Affordability (64%), taste (61%), freshness (60%) and nutritional value (54%) are respondents' top priorities when making food purchases; the environmental impacts of food products are reportedly less important, even among those who are environmentally concerned. Across countries, 24% of households consume red meat several times a week, and less than half of respondents (ranging from 20% in France to 41% in Israel) indicate that they would be willing to substitute conventional meat with a lab-grown alternative. Those who are reluctant to do so express reservations about lab-grown meat (e.g. its health impacts).

Policy implications

- Overall, availability, affordability and convenience are key incentives for households to make environmentally sustainable choices. Policies should therefore seek to remove barriers to action related to these aspects, while creating the right incentive framework to encourage uptake. Survey results point to a number of policy priorities:

- o **Make sustainable choices available and feasible.** Key bottlenecks to sustainable behaviour include a lack of availability and awareness, e.g. of renewably generated electricity options or charging stations for electric vehicles, as well as feasibility, e.g. solar panels for tenants or solar energy options (e.g. community solar) for those living in apartment buildings.

- o **Provide incentives that promote sustainable choices.** Affordability and convenience are important factors for encouraging sustainable choices, especially around transport and food. Income and environmental concern are important factors in many household decisions, but environmental concern alone does not appear to be enough to change certain behaviours (e.g. eating red meat or using a car, when alternative modes are feasible).

- o **Leverage existing public support to advance environmental policies**. Respondents systematically express less support for taxes and fees than for measures that make sustainable alternatives more affordable, such as subsidies. Policy complementarity is an important consideration, as households' acceptance of and ability to respond to tax-based measures depends on the alternatives they have available to change their behaviour. In addition to providing sustainable alternatives, complementary policies to taxes and fees include a recycling of the revenues generated (e.g. to fund improvements in public transport).

- o **Bundle incentives to maximise impact.** Certain environmental behaviours go hand in hand. Complementary incentives can reward environmental action in one domain by providing incentives for action in another domain. For example, those who shop with reusable containers could receive discounts on sustainable food items.

1.1. Introduction

Environmental pressures from household consumption are significant. Without greater policy effort, their impacts are likely to intensify over the coming years as populations and disposable incomes grow. Strategies that promote environmentally sustainable lifestyles and consumption patterns are urgently needed for reducing these pressures.

Analysis by the Intergovernmental Panel on Climate Change (IPCC) shows that strategies that change households' daily choices (demand-side strategies) have the potential to reduce greenhouse gas (GHG) emissions by 40-70% (2022[1]). Examples of these changes include avoiding conventional car use and air travel, shifting to plant-based diets and improving energy efficiency in residential buildings. In the energy sector, demand-side management approaches are a well-established tool for managing energy use. Examples include the introduction of on-site energy generation and storage, such as solar panels, or the use of smart meters to make households more aware of their energy use (Warren, 2018[2]).

Reducing the intensity of individual and household behaviour that negatively impact the environment is also a key factor in tackling many other environmental issues, including natural resource management, land-use change and pollution (IPBES, 2019[3]). It can also improve the basic constituents of well-being, such as economic stability, health and nutrition (IPCC, 2022[1]; IEA, 2022[4]; OECD, 2019[5]). In food systems, adopting plant-based diets can reduce the amount of land needed for agriculture by an estimated 76% (Poore and Nemecek, 2018[6]). In the realm of waste management, small charges on single-use plastic bags have been found to reduce disposable bag use by over 40% (Homonoff, 2018[7]).

To be successful, strategies to shift to more sustainable consumption patterns (e.g. from private cars to public transport, walking or cycling) and to reduce the environmental impact of existing consumption patterns (e.g. using more efficient household appliances) require supporting technologies and infrastructure (Creutzig et al., 2021[8]). Critically, they also require households to make changes to their behaviour (Dubois et al., 2019[9]). This is not only because the effectiveness of many technologies relies on their uptake by individuals and households, but also because behaviour change alone can help to reduce environmental impacts substantially (Box 1.1).

Box 1.1. The avoid-shift-improve framework

The avoid-shift-improve (ASI) framework highlights the potential of three types of behavioural approaches for reducing environmental impacts (IPCC, 2022[1]):

- *avoid* unnecessary consumption or damaging activity
- *shift* consumption or activity towards less environmentally damaging alternatives
- *improve* the environmental performance of the activity in question.

In the buildings sector, modelling suggests that avoidance strategies such as adjusting dwelling sizes to household size or improving the energy efficiency of homes, could reduce greenhouse gas emissions by around 78%. In the land transport sector, shifting towards the use of electric cars could account for much of the sector's emissions reduction potential, if this transition is combined with an electricity sector sourced entirely from renewables. In the food sector, around 41% of emissions reductions could be achieved through avoid and shift behaviours alone, such as avoiding food waste and shifting to flexitarian, vegetarian or vegan diets. In the manufactured goods sector, avoid measures (e.g. sharing instead of buying new products) and improve behaviours (e.g. using recycled materials) could achieve emissions reductions of 41% (Creutzig et al., 2021[8]).

Realising the potential of individuals' choices for improving sustainability and well-being can be challenging. The difficulty of changing behaviour is well established in the literature (van Valkengoed, Abrahamse and Steg, 2022[10]; Blake, 2007[11]). Individuals' motivation and capacity for change are heavily influenced by numerous factors, including the socio-economic and technological systems in place that determine the resources, constraints and options available to consumers (Kaufman et al., 2021[12]; Sorrell, 2015[13]). Developing policies that are effective at inducing desired behavioural change requires a well-developed understanding of the determinants of individual and household behaviour, including the role of institutions therein (van Valkengoed, Abrahamse and Steg, 2022[10]; Blankenberg and Alhusen, 2019[14]).

The OECD Surveys on Environmental Policies and Individual Behaviour Change (EPIC) explore what drives household behaviour and how policies may affect decisions in key consumption areas. Following similar surveys in 2008 and 2011 (OECD, 2011[15]; OECD, 2014[16]), this third round covers a sample of more than 17 000 households. The survey was implemented in nine OECD countries (Table 1.1): Belgium (BEL), Canada (CAN), France (FRA), Israel (ISR), the Netherlands (NLD), Sweden (SWE), Switzerland (CHE), the United Kingdom (GBR) and the United States (USA). It addresses household behaviour in four key areas: energy use, transport, waste practices, and food consumption. Chapters 2 to 5 present the findings of the four thematic areas (Figure 1.1). This overview chapter describes the methodology, key findings and policy implications.

Figure 1.1. Report roadmap

1. Household behaviour and the environment: key findings and policy implications
- 1.1 Introduction
- 1.2 Implementation approach and context
- 1.3 Patterns in attitudes, behaviours and support
- 1.4 Preliminary policy implications

2. Household behaviour and residential energy use
- 2.1 Introduction
- 2.2 Household energy sources
- 2.3 Low-emissions energy technologies
- 2.4 Energy conservation
- 2.5 Support for energy policies

3. Household behaviour and transport
- 3.1 Introduction
- 3.2 Public transport and long-distance travel
- 3.3 Conventional and electric car use
- 3.4 Support for transport policies

4. Household behaviour and waste practices
- 4.1 Introduction
- 4.2 Reduce and reuse behaviour
- 4.3 Collection and charging
- 4.4 Mixed waste and recycling
- 4.5 Food waste

5. Household behaviour and food consumption
- 5.1 Introduction
- 5.2 Household dietary habits
- 5.3 Household shopping habits
- 5.4 Support for food systems policies

1.2. Implementation approach and context

1.2.1. Methodology

In addition to collecting information on reported environmental behaviours, the survey records the socioeconomic characteristics of respondents and households, as well as the characteristics of their residence and residential location. Each round of the EPIC Survey is described in Table 1.1. The questionnaire for the third round of the survey can be found in Annex A.

Table 1.1. OECD EPIC surveys: coverage, thematic areas and sample sizes

	2008	2011	2022
Countries included	Australia	Australia	
			Belgium
	Canada	Canada	Canada
		Chile	
	Czech Republic		
	France	France	France
		Israel	Israel
	Italy		
		Japan	
	Korea	Korea	
	The Netherlands	The Netherlands	The Netherlands
	Norway		
	Mexico		
		Spain	
	Sweden	Sweden	Sweden
		Switzerland	Switzerland
			United Kingdom[1]
			United States
Total sample size	10 000	12 303	17 216
Methodology for measuring preferences and behaviour	Self reporting	Self reporting	Self reporting + choice experiments
Number of thematic areas	5	5	4
Possibility to test hypothetical policy interventions	No	No	Yes
Distributional issues addressed	No	No	Yes
Implementation medium	Online	Online	Online

1. The sample from the United Kingdom includes households in England, Northern Ireland, Scotland and Wales.

The EPIC Survey provides a rich dataset of self-reported behaviours. There is considerable cross-country variation in a number of factors that might affect the results. These include differences in the proportions of households living in urban and rural areas, as well as differences in the proportion of households that own or rent their homes. Summary statistics for these variables, as well as socioeconomic characteristics other than those used to generate representative quotas (i.e. gender, age, income and region), can be found in Annex B, along with methodological details on the implementation of the EPIC Survey. Box 1.2 presents the discrete choice experiments, an important methodological novelty in the third round of the EPIC Survey, which will be analysed in future work.

As a stated preference approach, the EPIC Survey gathers data by asking individuals to either report their actual behaviour, or how they would behave in a given hypothetical situation. This approach can help indicate the effectiveness of existing environmental policies, as well as the potential impact of hypothetical policy measures. A number of considerations should be taken into account when interpreting the results of stated preference data.[1] For example, self-reports tend to be more accurate for habitual behaviour (e.g.

turning off the lights when leaving a room) than for those that are planned (e.g. installing a heat pump). In addition, the context in which data collection takes place has implications for how the data should be interpreted. For example, extreme events such as economic downturns or natural disasters can affect household's budgets and their ability to pay, in addition to other factors such as their awareness of an issue. This in turn can influence how respondents respond to survey questions (Mourato and Shreedhar, 2021[17]). This is discussed further in Section 1.2.2.

Box 1.2. Using discrete choice experiments to refine our understanding of decision making

In discrete choice experiments, subjects are asked to make hypothetical choices by selecting a preferred alternative from a menu of options (Bateman et al., 2002[18]; OECD, 2018[19]). Stated preference data generated by discrete choice experiments enable an estimation of how much respondents value the various characteristics of the options presented. These characteristics could relate to products (e.g. the price of, or GHG emissions from, energy supply); actions (e.g. convenience of using disposable rather than refillable containers); or elements directly affected by environmental policies (e.g. the cost and convenience of owning an electric car).

Relative to stated preference approaches, discrete choice experiments have several advantages. First, they can provide a more accurate reflection of the types of choices that respondents are likely to face in the real world given the specific characteristics, availability and prices of these different options. Examples include the choice between reusable and single-use packaging or private and public transport.

Second, discrete choice experiments can generate data that provide a richer picture of preferences than simpler stated preference elicitation methods. Specifically, the data generated by choice experiments allow for an estimation of how much respondents value the characteristics of the options being considered, also known as willingness-to-pay. Examples include travel time, travel cost, and comfort for transport mode options, or cost and convenience for waste reduction practices. The data can also provide insights into how respondents make trade-offs between these characteristics and how sensitive their choices are to changes in the characteristics of the options presented.

Finally, the EPIC Survey data allow for disaggregation at the household level to understand how these values and sensitivities vary across the population according to location or socio-demographic variables such as age, income and gender. This can provide useful information on the role of individual-specific factors in environmental behaviours and preferences for different types of environmental policy instruments.

1.2.2. Implementation context

The third EPIC Survey was implemented in June-July 2022, more than a decade after the second round of the survey, in 2011. Changes since then to the environmental, political, technological and economic context have all contributed to the need to reassess environmental attitudes and behaviours, as well as the effectiveness of environmental policies.

The research community has played an important role in bringing into focus the dynamics of the recent changes in the physical environment and their interactions with the human environment (IPBES, 2019[3]; IPCC, 2022[1]; IPCC, 2023[20]). The increased frequency and intensity of environmental change witnessed across the world, as well as the media coverage of the associated damage, have enhanced public awareness further of the human impact on the planet and the urgent need to limit and address these impacts. Media outlets have also played an important role in reporting on the actions taken by governments and the private sector and in providing platforms to raise awareness and engagement on the urgent need to address pressing environmental challenges and climate change.

While political progress has varied, environmental issues have generally risen up national and international agendas. Governments have agreed to accelerate action to meet climate and other environmental objectives, with milestones including the adoption of the Paris Agreement on Climate Change in 2015 and the Global Biodiversity Framework in 2022. A resolution to reach agreement on an internationally legally binding instrument to end plastic pollution, including in the marine environment, is also foreseen by the end of 2024. Resource efficiency and transitioning to a more circular economy (i.e. pursuing circularity in materials use) have risen rapidly to the top of environmental agendas in the past decade (OECD, 2022[21]).

Technological innovations have also altered the landscape for possible action by individuals and households. The cost of electricity from large-scale solar photovoltaic facilities declined by 88% between 2010 and 2021, while the cost of onshore and offshore wind declined by 68% and 60%, respectively. As a result, these renewables were less expensive to produce than new fossil-fuel fired power generation in 2021 (IRENA, 2022[22]). Larger battery packs that extend the range of electric cars, and more extensive coverage of charging stations, have also made electric cars increasingly better substitutes for conventional cars. Smarter energy end use applications, which enable consumers to track their real time and accumulated energy consumption, have the potential to change energy use patterns. Digital platforms have also enabled new modes of transport (e.g. electric kick-scooters) and car use, such as car-sharing platforms and carpooling or ride-sharing platforms. The range of plant-based food items available to consumers has also significantly expanded in recent years. While these examples do not provide a complete overview, they point to the scale of technological changes that have taken place over the past decade.

In the two years leading up to the third EPIC Survey, societies and economies globally had been significantly affected by the COVID-19 pandemic and its associated crises. By the end of 2021, many countries had eased COVID-19 restrictions, and while the global economy was experiencing some recovery in trade, employment and income, progress was imbalanced across countries and sectors (OECD, 2021[23]). Economic projections were nonetheless cautiously optimistic for 2022, but this changed with Russia's large-scale aggression against Ukraine. The war and the associated geopolitical uncertainty, combined with continuing pressures from the COVID-19 pandemic, contributed to a cost-of-living crisis in 2022. Low-income households, emerging markets and developing economies were hardest hit, primarily due to steep increases in energy and food prices. The supply shocks induced by the invasion also affected the global economy (OECD, 2022[24]). Disrupted transport routes increased trip distances and the carbon footprints of the transport of some goods.

The EPIC Survey was implemented in mid-2022, when the most significant COVID-19-related restrictions (lockdowns and international travel bans), had been lifted in all the sample countries. However, the period continued to be characterised by historically high energy prices, inflation and geopolitical tensions. The particularities of this context could have several implications for survey responses. Self-reported levels of support for tax instruments, for example, may be lower, while support for policy measures involving financial support (e.g. grant and subsidies) may be higher. Similarly, reported preferences for lower-cost energy saving measures may be greater than for measures with higher investment costs. Further, the particular context of the energy crisis may have also led to increased interest in energy efficiency technologies. Equally, the lingering impacts of the COVID-19 pandemic may have dampened households' willingness to, e.g. use public transport. Increasing economic concerns may make disincentive measures (e.g. taxes) less politically palatable; however, they can make measures that align sustainable habits with monetary savings (e.g. energy conservation) more likely to be adopted.

These contextual factors should not be seen as a limitation of the study. On the contrary, it is scientifically worthwhile to elicit preferences in the wake of social shifts, and the descriptive results presented here reflect the unique circumstances of 2022. The EPIC Survey can contribute to a body of evidence aiming to better understand environmental behaviours in the context of potential changes in individual preferences in a time influenced by interlocking crises.

1.3. Patterns in environmental attitudes, behaviour and support for policies

A focus on behaviour change in this report relies on a well-developed understanding of the attitudes of the sample population and how those attitudes interact with exposure to different policy measures. This section provides an overview of respondents' environmental attitudes.

Respondents of the EPIC survey are most concerned about personal safety and economic issues. Overall, 42% and 41% of respondents report personal safety and economic concerns as very important, respectively (Figure 1.2). In the 2022 survey, public health was less often highlighted as a very important issue of concern, despite the impacts of the COVID-19 pandemic during the two years preceding survey implementation. However, this may also reflect the fact that at the time of the survey, the participating countries had lifted many, if not most of their COVID-19 restrictions.

Over a third of respondents (35%) indicated that climate change or other environmental issues (e.g. pollution) as a very important issue of concern. In five countries, climate change and other environmental issues were ranked among the top three issues of concern. Across many countries, concern for climate change and the environment tends to be expressed to a greater extent by women, respondents with higher education, and older segments of the population. A greater concern for climate change and environmental issues among older respondents could be explained in part by a higher proportion of high-income respondents among older age groups (Figure 1.3). The relatively small difference in issue importance between those with and without higher education in some countries may suggest that awareness of climate change is becoming more widespread in the public discourse.

Figure 1.2. Concerns about the economy and personal safety outrank concerns about the climate and the environment in most countries

Percentage of respondents rating various issues as very important
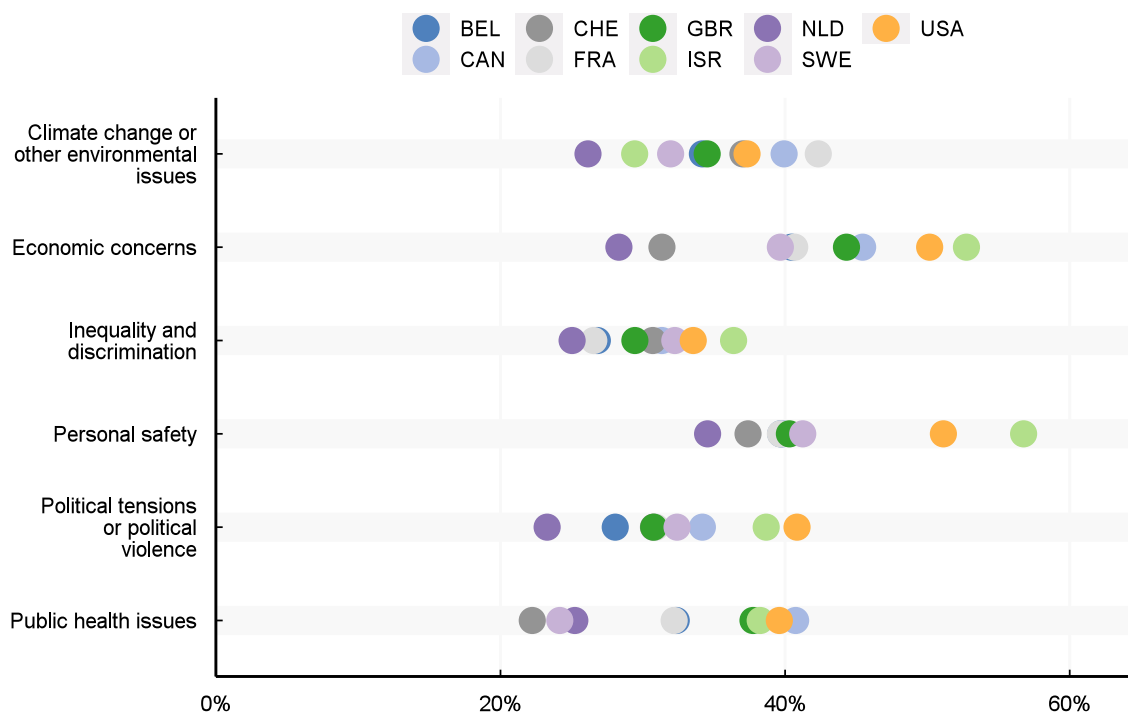
Note: This survey item asked respondents: "How important are each of the following issues to you personally?" Respondents rated the level of importance on a 5-point scale from "not at all important" to "very important".
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ⋙ https://stat.link/70wunx

Figure 1.3. Importance of environmental issues varies across gender, education, age and income

Percentage of respondents rating climate change and environmental issues as very important
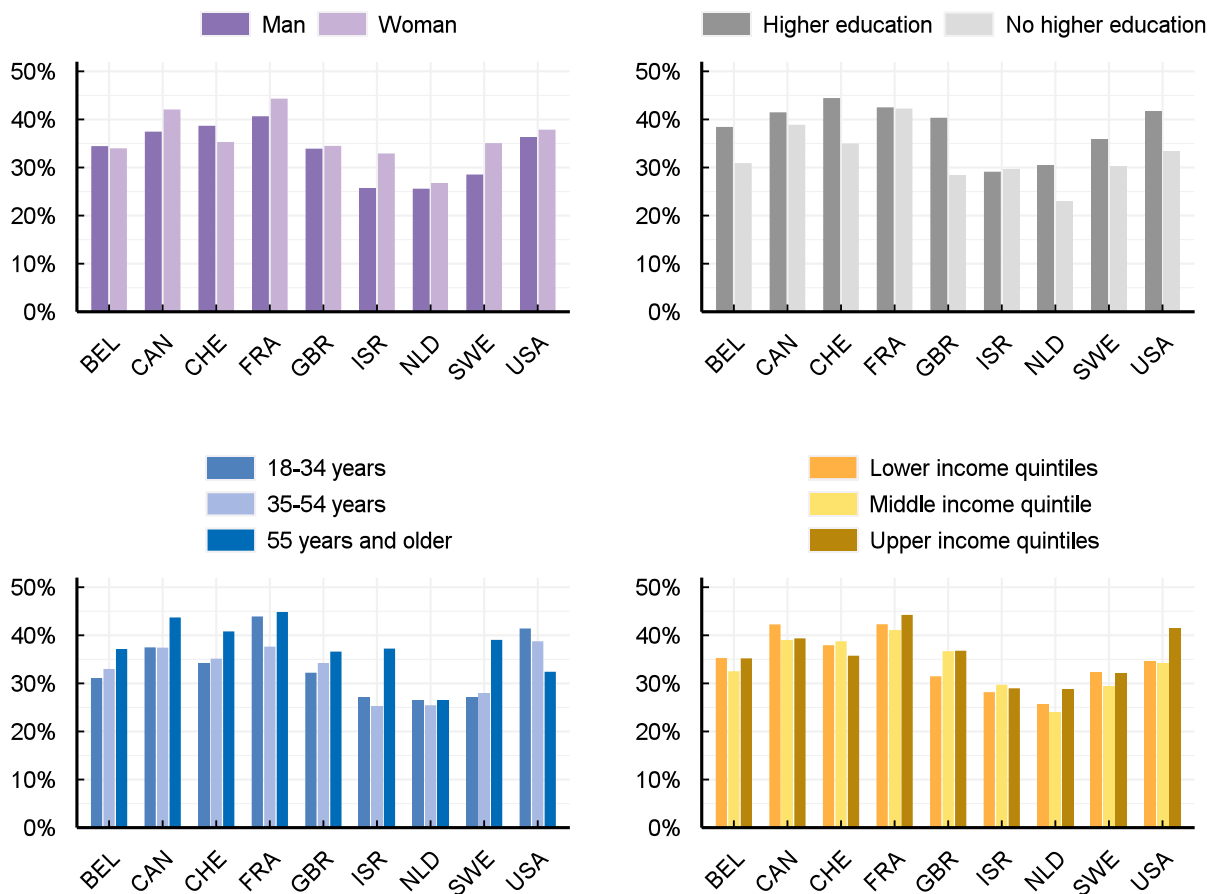
Note: This survey item asked respondents: "How important are each of the following issues to you personally?" Respondents rated the level of importance on a 5-point scale from "not at all important" to "very important". The figure shows the percentage of respondents rating climate change and environmental issues as very important (exclusively respondents stating 5 on a scale 1-5). Lower income quintiles refer to income quintiles 1 and 2, middle income quintile refers to income quintile 3, and upper income quintiles refer to income quintiles 4 and 5.
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ⧉ https://stat.link/z34aql

Of all the environmental issues covered in the survey, climate change was ranked as one of the top three issues of concern in all countries. Further findings indicate that resource scarcity (e.g. of water or food) was the second most frequently cited issue. Respondents across countries also ranked concerns related to pollution (water, outdoor air and plastic pollution) and the fragility of land ecosystems among the top three issues of concern.

More than half of respondents expect climate change and environmental issues to reduce the quality of life of both current and future generations (Figure 1.4). It is interesting to note that fewer respondents across all countries foresee an impact on their job security. No significant differences are observed across age, gender or income levels for the proportion of respondents expecting that climate change will have negative impacts on all aspects of their lives.

Figure 1.4. Most respondents expect climate change to reduce younger generations' quality of life

Percentage of respondents
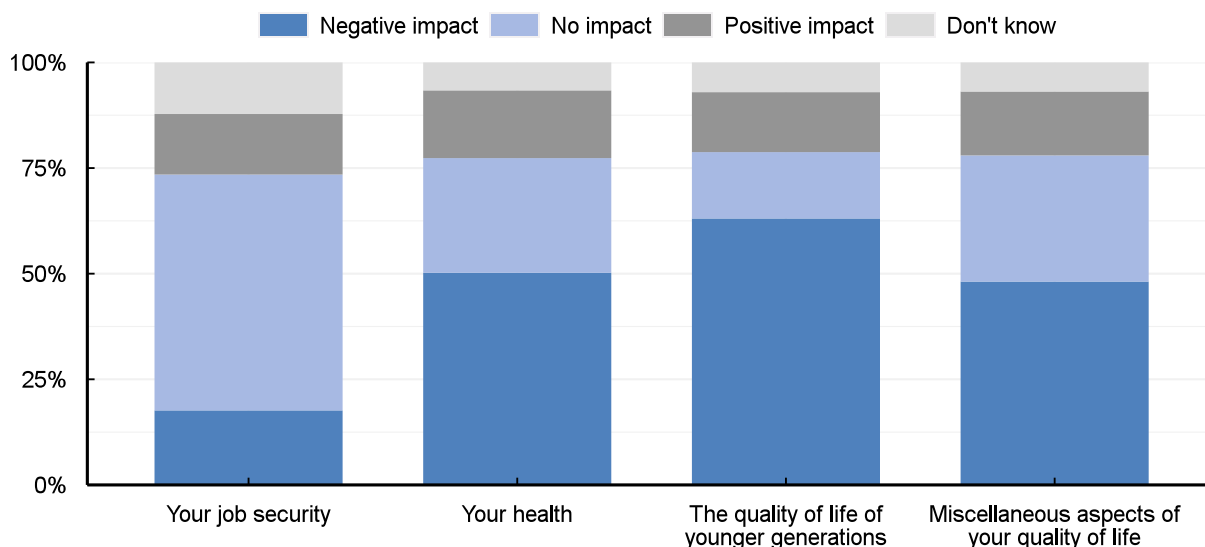
Note: This survey item asked respondents: "How do you expect climate change (e.g. rising average temperatures, changes in extreme weather events) or other environmental issues to impact the following?" Respondents rated the impact on a 5-point scale from "very negatively" to "very positively".
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink 🔗 https://stat.link/f5s78q

Respondents' perceptions of their own role in addressing climate change and other environmental issues, as well as their support for potential policy measures, can be observed from their agreement with statements about environmental problems and their solutions (Figure 1.5). A majority of respondents (65%) said they were willing to make personal compromises to their current lifestyles for the benefit of the environment. For almost as many respondents (63%) these compromises should not cost them extra money.[2] Approximately 40% of respondents agreed or strongly agreed with both statements, pointing to a likely challenge for governments in implementing demand-side measures.

While there are slight variations across countries, those in lower- and middle-income percentiles are more likely to agree or strongly agree that environment and climate policies should not personally cost them extra money. This observation is consistent with findings from an OECD survey into the determinants of public acceptance of climate policies in 20 high- and middle-income countries (Dechezleprêtre et al. (2022[25]); see Box 1.3). That survey concluded that support for climate policies depends on respondents' own household's gains and losses, in addition to the perceived effectiveness of the policies in reducing greenhouse gas emissions. Figure 1.5 also reflects respondents' confidence in policy action and technological innovation for addressing climate change and other environmental issues. In comparison, respondents generally do not agree that these issues are overstated or should be left for future generations to deal with.

Figure 1.5. Most respondents would make lifestyle compromises to benefit the environment

Percentage of respondents agreeing or strongly agreeing, or disagreeing or strongly disagreeing, with statements
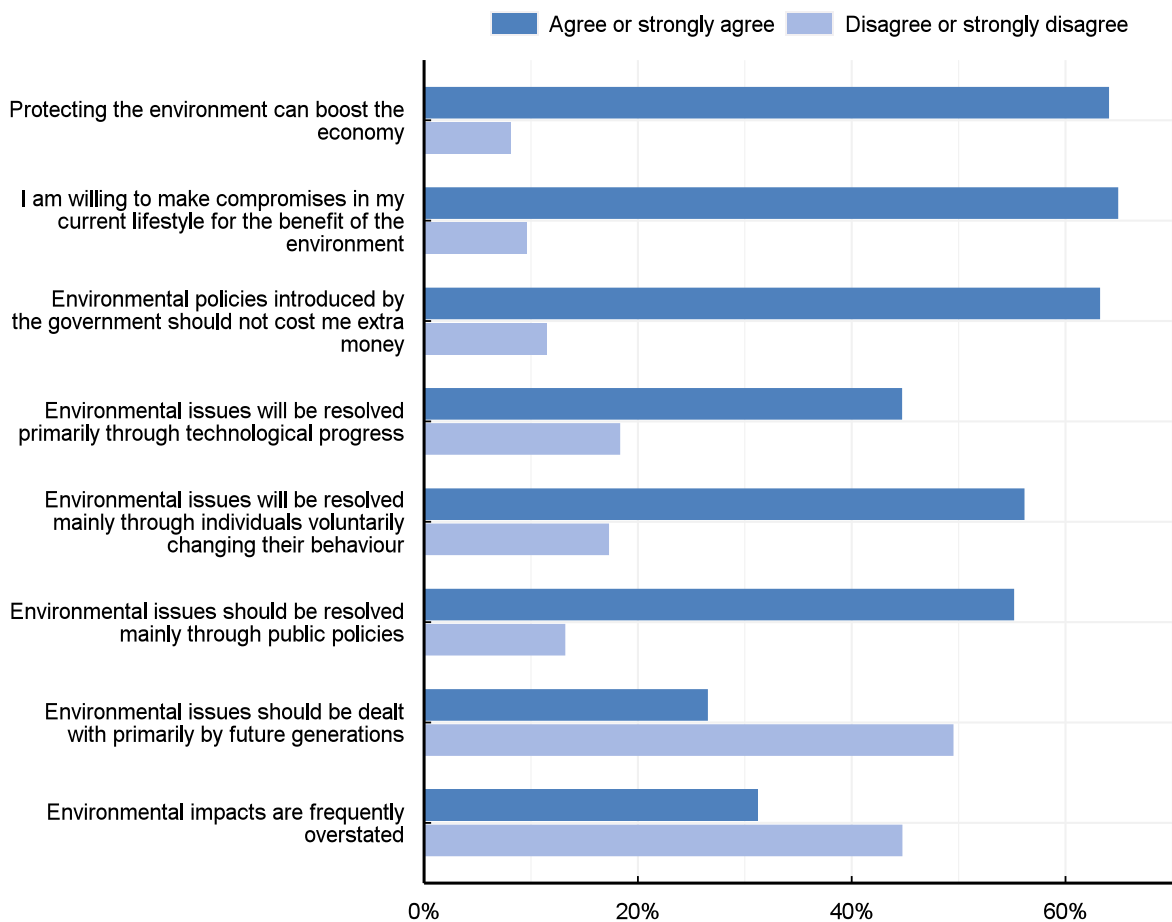
Note: This survey item asked respondents: "To what extent do you agree with each of the following statements?" Respondents stated their level of agreement on a 5-point scale from "strongly disagree" to "strongly agree".
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink https://stat.link/2uaw5d

Box 1.3. What drives environmental attitudes?

Individual and household demographic variables alone cannot explain perceptions of environment or climate change issues. Broader socio-political variables, including political orientation and worldviews, also play an important role (Poortinga et al., 2019[26]; Whitmarsh and Capstick, 2018[27]). While this goes beyond the scope of the EPIC Survey, a related OECD survey that examined understanding of and attitudes towards climate change and climate policies in 20 high and middle-income countries concluded that political leaning, among other factors, is significantly correlated with policy views and overall reasoning and beliefs about climate change (Dechezleprêtre et al., 2022[25]). These findings are consistent with those emerging from another survey on climate perceptions in 22 European countries and Israel (Poortinga et al., 2019[26]). Research focusing on France only, however, does not find a strong correlation between awareness of climate change and political affiliation (Douenne and Fabre, 2020[28]). Research further suggests that cross-national differences may be related to experiences with extreme weather events, vulnerability to the impacts of climate change, the nature of media coverage of climate-related issues and dependence on fossil fuels (Poortinga et al., 2019[26]).

1.3.1. Environmental behaviour has changed over time

A few broad observations can be made about trends in environmental behaviours over time in countries which have participated in more than one survey.[3] Canada, France, the Netherlands and Sweden participated in all three rounds of the EPIC Survey (2008, 2011 and 2022), while Israel and Switzerland participated in both the second and third rounds.

Survey results suggest that some low-emissions energy options have become more available to households. In Sweden, for example, approximately 15% more households report having an option to purchase renewably generated electricity in 2022 compared to 2011. In the Netherlands, approximately 40% more households report smart meter availability. However, reported adoption of low-emissions energy options does not match this greater availability. There was no significant change in the main types of primary energy sources reported between 2011 and 2022 (i.e. electricity vs. fossil-fuel-based energy). The data also suggest that lowering the costs of energy efficiency equipment and renovations is now more important to respondents than it was in 2011. Differences in the samples limits the extent to which direct comparisons of the results can be made across survey rounds.

There have also been some changes in the coverage of collection services and in waste charging schemes. For example, survey results suggest an increase in services that collect recyclable waste from households' residences in France, the Netherlands and Sweden. The survey also suggests slight increases in the use of per-unit charges for waste charging schemes in Canada and the Netherlands. As in 2011, the provision of recycling collection services is still associated with less mixed waste generation on average.

Direct comparisons of transport and food consumption results over time are less straightforward as the questions asked in these sections of the survey have changed more over the three rounds. In 2022, public transport investments received the most widespread support of any policy measure surveyed, surpassing support for subsidies for low-emissions cars, which received the highest support in 2011. Factors identified as important for improving public transport have remained the same over time and include more convenient and cheaper services. Meanwhile, survey results do not indicate substantial increases in organic food consumption. In 2011, the share of food expenditure dedicated to organic fruit and vegetables ranged from 13% to 35% in repeat survey countries. In 2022, the proportion of households reporting that they often or always consume organic food ranges from 15% (in Canada) to 31% (in Switzerland).

1.3.2. The COVID-19 pandemic has had an impact on some environmental behaviours

The COVID-19 pandemic has had repercussions for behaviour in many areas. Individual travel, energy use, consumption, food and waste behaviour shifted dramatically during lockdown periods worldwide. As the COVID-19 pandemic subsided, a gradual removal of restrictions led to a return to normal for some environmentally relevant behaviours, while other shifts appear to be more persistent (de Palma, Vosough and Liao, 2022[29]).

Several mechanisms are at play in some of the more enduring behaviour changes. First, COVID-19 has led to changes in the conditions that shape behaviour, such as prices and income (affecting households' purchasing power and relative prices); the consumer options available (e.g. transportation modes and infrastructure, teleworking, expanded e-commerce); and policy-driven regulations and incentives (e.g. subsidies for bicycle purchases or restrictions on natural gas use). Second, evidence from other extreme events suggests that the pandemic may have also changed how households react to a given set of constraints when making decisions that can impact the environment, such as how they allocate their household budget (Hanaoka et al., 2011[30]; Bogliacino, Montealegre and Folkvord, 2020[31]; Cassar, Healy and von Kessler, 2017[32]). Some evidence also suggests that the pandemic has increased public awareness of global issues. For example, research suggests that it may have made purchasing locally produced products a higher priority in some locations (Dangelico, Schiaroli and Fraccascia, 2022[33]). Other evidence indicates that while the pandemic decreased plastic use in the short term due to reduced economic activity, it does not appear to have affected the long-term trend of increasing plastic use (OECD, 2022[21]).

Responses to the EPIC Survey add to this body of evidence, revealing some changes in circumstances or intentions as of mid-2022 (Figure 1.6):

- Although most survey respondents (57%) expect to fly as much after the COVID-19 pandemic as before, 28% indicate that they expect to fly less.

- Meanwhile, 29% respondents indicate that they expect to eat out less frequently after the COVID-19 pandemic compared to before, whereas 17% expect to do so more often; similarly, 25% of respondents expect to order food for delivery less often compared to 15% who expect to do so more often.

- Households overwhelmingly report that their volumes of mixed and recyclable waste have not changed since the COVID-19 pandemic.

Figure 1.6. The COVID-19 pandemic has only affected a minority of households' environmental behaviour
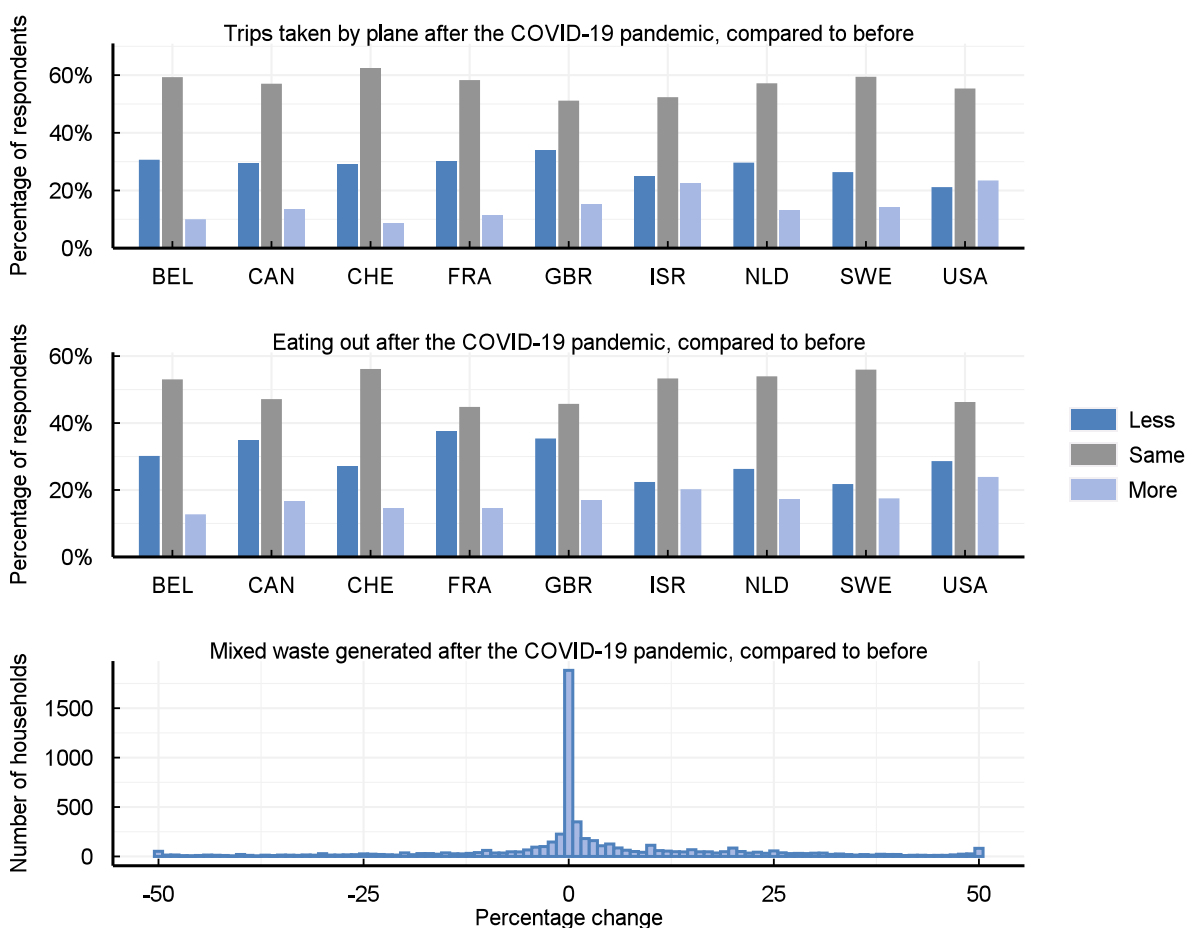
Note: The survey item on plane trips asked respondents: "Compared to before the COVID-19 pandemic, how often do you expect to use the following modes of transport for long trips (100 miles/200km or more one way) once the pandemic is well under control?". The survey item on food consumption asked: "Compared to before the COVID-19 pandemic, how often do you expect to eat out once the COVID-19 pandemic is well under control?". For these items, the response options were: More than before, Slightly more than before, Same as before, Slightly less than before, Less than before, Don't know, I don't expect to do this. The survey item on waste asked respondents: "On average, how many of the following bags/bins of mixed waste (i.e. non-recyclable and non-compostable waste) does your household generate each week?". For this item, respondents were able to indicate the percentage increase or decrease.
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink 🔍📊 https://stat.link/emg82w

1.3.3. Some environmental behaviours go hand in hand with others

The survey indicates a positive association between several types of environmental behaviour. For example, respondents who often or always try to conserve energy are more likely to reduce and reuse to avoid waste (e.g. borrowing or renting items instead of buying new ones) (Figure 1.7). In Canada, Sweden and the United States, for example, those who reduce and reuse most are significantly more likely to report that they always or often try to reduce their energy consumption than those that are less engaged in reduce and reuse behaviours. A similar pattern is evident between those who engage in energy conservation and sustainable food consumption. Figure 1.8 compares the frequency with which respondents consume seasonal foods with groups that either i) rarely or ii) always or often conserve energy.

Figure 1.7. Respondents who conserve more energy are also more likely to reduce and reuse

Percentage of respondents engaging in reduce and reuse behaviours grouped by energy conservation behaviour
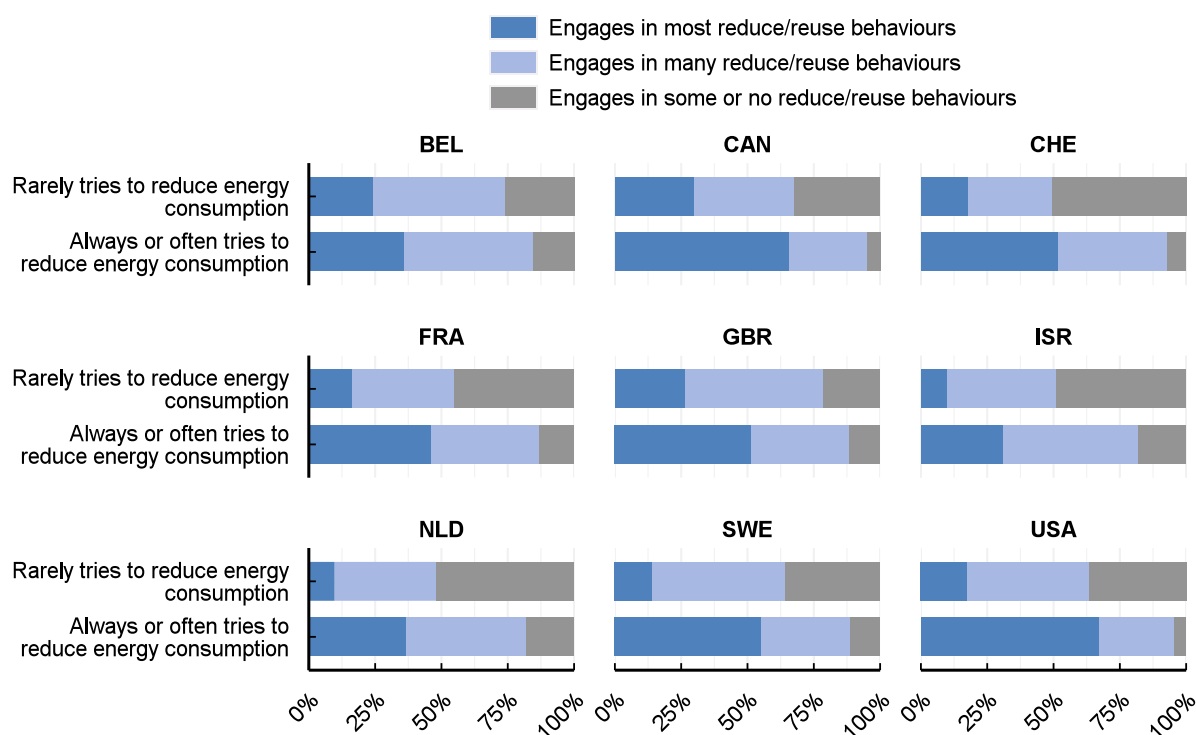
Note: The survey item on behaviours to reduce and reuse asked respondents "How often do you do the following in your daily life?". Respondents are classified as engaging in "most" behaviours if they on average often or always engage in 8 to 9 out of 9 behaviours; they are classified as engaging in "many" behaviours if they on average engage with 6 to 7 behaviours; and as "some or none" with less than 6. Respondents are grouped by their energy conservation behaviour, for which the survey asked "How often do you do the following in your daily life?". The figure shows the average behaviour across all energy conservation items.
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ⧉ https://stat.link/k82u3q

Figure 1.8. Respondents who conserve energy are also likely to practise sustainable food consumption

Percentage of respondents eating seasonal food grouped by energy conservation behaviour
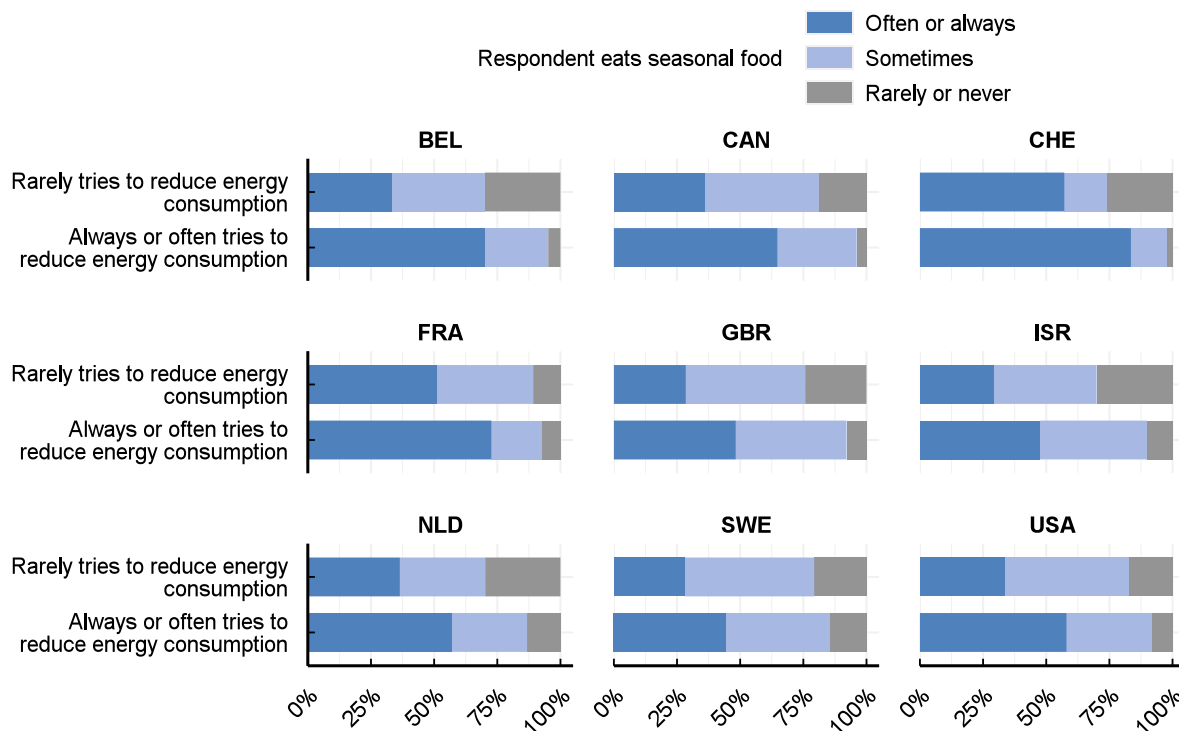
Note: The seasonal food survey item asked respondents: "How often do you eat seasonal food?" Respondents could choose never or rarely, sometimes, often or always. Respondents are grouped by their energy conservation behaviour, for which the survey asked "How often do you do the following in your daily life?". The figure shows the average behaviour across all energy conservation items.
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ⏯ https://stat.link/yznjbw

There is also a positive association between certain food purchase and food waste behaviours. Figure 1.9 shows that those who report frequently eating seasonal food are also more likely to report that they do not waste food. The opposite appears to be the case for the consumption of processed foods, as those who consume processed foods more frequently report that they generate more food waste than those who never consume processed food. Policy measures could make use of this association by, for example, offering discounts on sustainable food items to those who bring their own containers shopping or have rented or borrowed from peer-to-peer platforms to reduce material resource use. Successfully implementing combinations of different policy measures would require an assessment of the distribution of their costs and benefits, as well as co-ordination across sectors.

Figure 1.9. Respondents who eat sustainably are less likely to waste food

Percentage of respondents wasting at least some food
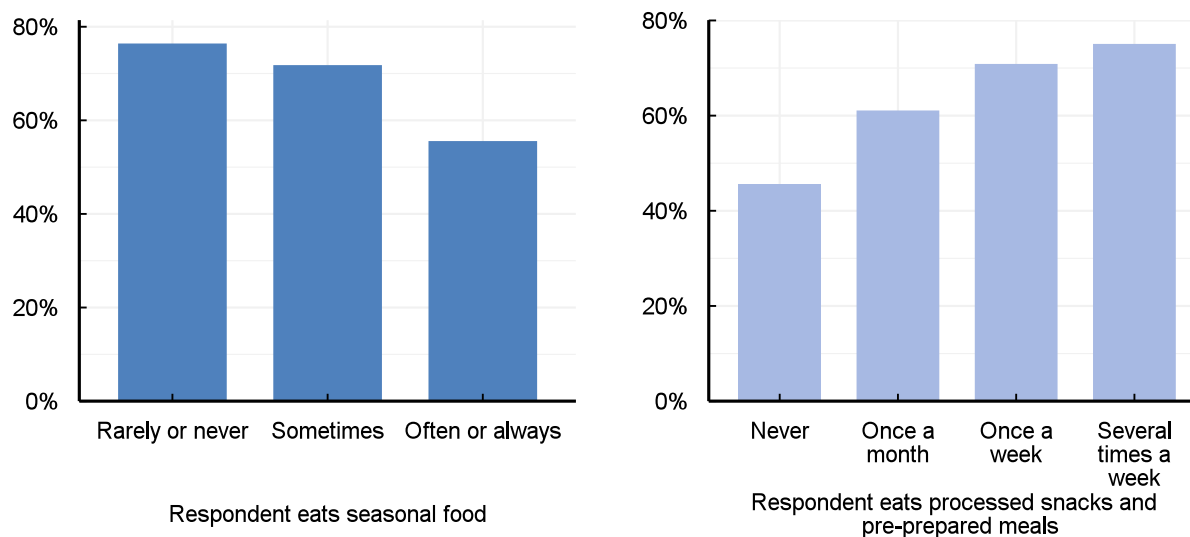
Note: The food waste item asked respondents: "What type of food does your household usually throw away? Please exclude non-edible parts of food, e.g. peelings, apple cores, etc.". The figure shows the percentage of respondents who did not say: "My household never throws away any food". Respondents are grouped by their food consumption. The survey item on frequency of consumption of different types of foods asked respondents: "How often do you personally do the following?" For seasonal food, respondents could choose never, rarely, sometimes, often or always. For processed snacks, respondents could choose never, once a month, once a week or several times a week.
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink 📊 https://stat.link/vipq9d

Electric car use also appears to be associated with the installation of energy efficiency equipment (Figure 1.10). Given that electric car users are not necessarily more environmentally concerned than users of other types of cars (discussed in Chapter 3), these results deserve further investigation. However, the associations are weaker between regular use of electric cars and investing in energy efficient windows, appliances and lightbulbs, as most respondents report engaging in these easier-to-adopt behaviours, not just those who own electric cars. In some areas, these results could reflect existing policies in effect.

Overall, these results could reflect existing evidence that environmental concern, self-identity and perceived self-efficacy (i.e. believing that one's actions make a difference) can underlie correlations between environmental behaviours (Lauren et al., 2016[34]). The results in this section warrant further analysis of the extent to which the correlations between behaviour in different areas may be driven by specific factors such as environmental concern or income.

Figure 1.10. Households that use electric cars are more likely to have energy efficiency equipment

Percentage of respondents that installed energy efficiency equipment by use of electric car
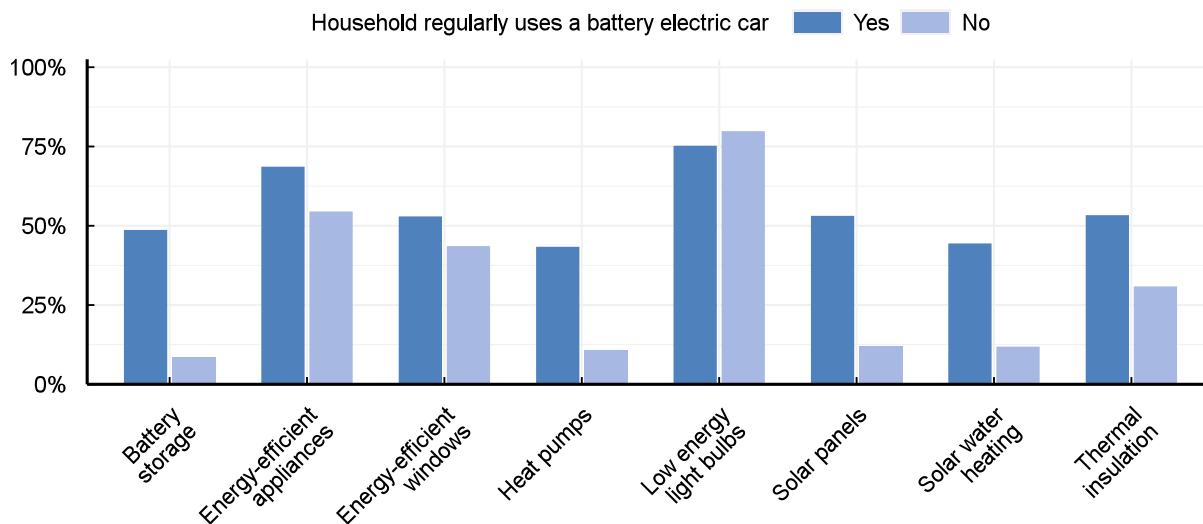
Note: This survey item asked respondents: "Have you installed any of the following items over the past ten years in your current primary residence?" The graph groups respondents by use of a battery electric car, for which the survey item asked respondents "Do you or does anyone in your household regularly use any of the following (including company-provided equipment)? Please select all that apply."
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink 🔢 https://stat.link/pceifk

1.3.4. The policies respondents support are linked to their environmental attitudes

The survey shows that respondents who are highly concerned about the environment express greater support for a range of environmental policies (Figure 1.11). The picture is similar for respondents who report that they have confidence in their government, relative to those that report having no confidence. It is well known that respondents' attitudes influence their support for specific policy measures; evidence also suggests that exposure to policy measures themselves may increase support for them (Brown and Johnstone, 2014[35]).[4] The survey suggests that support is widespread for information-based measures (e.g. education on sustainable diets) and structural measures (e.g. improved public transport). However, it is consistently lower for taxes and fees (e.g. a fee per kilometre driven, increased parking fees, or a tax on meat and seafood), even among respondents who report high environmental concern. These findings suggest that efforts to increase environmental awareness could boost support for some types of environmental policies, but not others.

There is some country-level variation in policy support, in particular for energy and transport policies. For example, improvements to public transport are supported most by respondents in Israel, and least by those in the United States. A charge for every kilometre driven receives the least support in Israel but the most support in the Netherlands. Energy taxes are least popular in France but most popular in Switzerland and the Netherlands, while energy subsidies are supported most by respondents in Israel and least by those in Sweden and the United States. There is less variation in support for food-related policies across countries. Taken together, these results provide a picture of whether the public in the sampled countries are willing to accept the institutional and structural changes needed to address environmental issues, as well as to support the policies needed to create these changes. Given that household responsiveness to and acceptance of price-based measures can be influenced by the alternatives they are provided, policy complementarity is an important point for policymakers to consider. More details on policy support for each thematic area are provided in Chapters 2-5.

Figure 1.11. How level of environmental concern affects support for environmental policies

Percentage of respondents agreeing or strongly agreeing with environmental policies
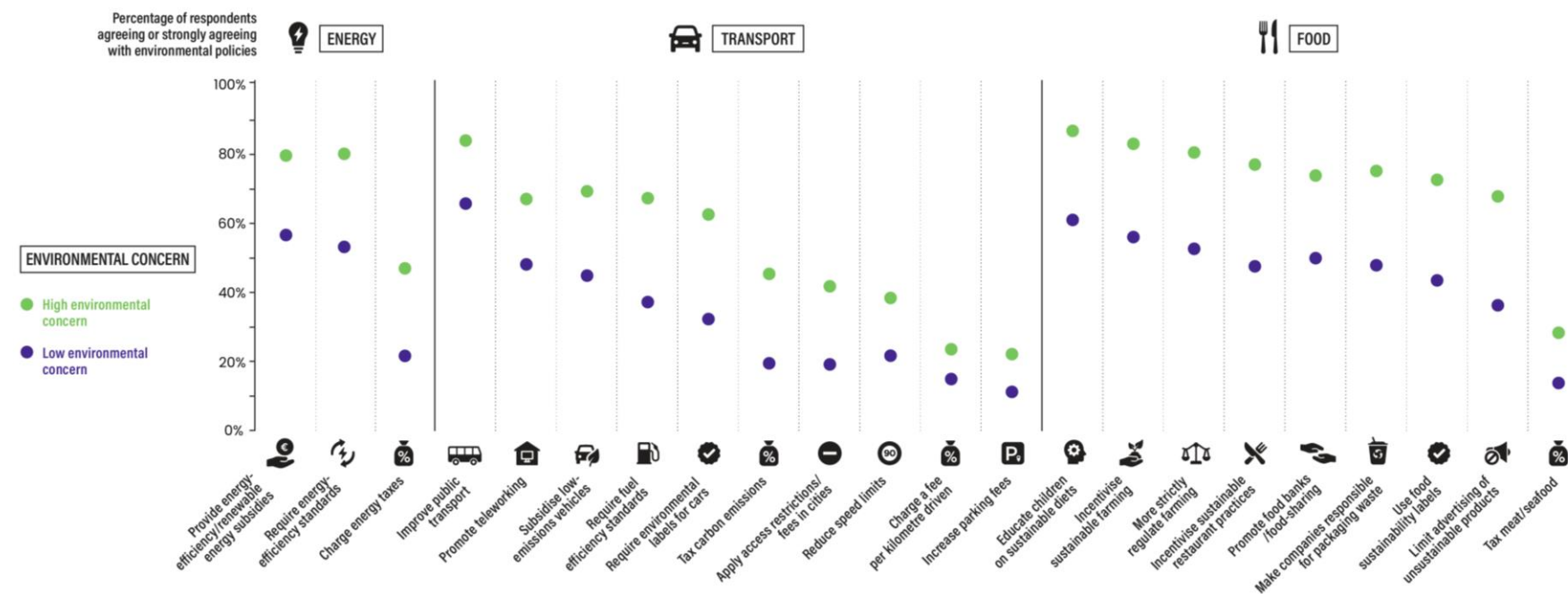
Note: These survey items asked respondents: "To what extent do you support the following potential policy measures?" (for energy), "What do you think about the following measures to improve the environmental sustainability of food systems?" and "What do you think about the following actions governments can take to reduce environmental impacts from cars?". Respondents stated their level of agreement on a 5-point scale from "strongly against (strongly disagree)" to "strongly support (strongly agree)."
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink https://stat.link/i21yqg

1.4. Preliminary policy implications of the EPIC Survey results

This section highlights the main policy implications of the survey results drawn from the thematic chapters of this report. The discussion is exploratory and provides preliminary evidence of the effectiveness of particular policy measures. Further analysis of the EPIC Survey data will be conducted to generate more robust evidence of determinants of behaviours and attitudes and of the conditions under which specific policies appear to be most effective.

1.4.1. Energy use

The survey suggests that households tend to adopt energy-saving behaviours that are easy and cheap to implement (Chapter 2). While 92% of respondents report actions such as turning off the lights when leaving a room, actions that could reduce comfort or require more effort are less likely to be taken. For example, 68% of respondents try to minimise their use of heating or cooling, and 75% air dry laundry. In the United States and Canada, the share of households that air dry laundry is relatively lower (44% and 35%, respectively), potentially explained by climatic conditions in certain regions preventing such behaviour for part of the year. Of all the reasons cited for not adopting these measures, around half mentioned forgetfulness, lack of awareness and difficulty of changing habits. Among those with smart meters, 52% report not using the information provided by these devices, which provide consumers with information that could be useful in managing their energy use.

The reported availability of low-emissions energy technologies remains modest, despite technological advances and evident interest. Overall, 30% of respondents indicate that they would be interested in low-emissions energy options such as renewable energy or differentiated electricity rates if provided by their energy provider, but they have not been offered them. The reasons given for the limited uptake of technologies differ according to dwelling type, ownership status and, to a lesser extent, income. Many households report that it is not feasible to install low-emission energy technologies such as solar panels or heat pumps in their residences. Among those living in apartment buildings, for example, 63% report that solar water heating and solar panels for electricity are not feasible to install, compared to 16% of respondents living in detached houses. Yet even among households for whom installation is feasible, around one-third report using solar panels (29%), heat pumps (30%) or battery storage (27%). Of respondents for whom installation is feasible, around one-fifth (21%) cite prohibitive purchase and installation costs as an obstacle to adoption. Among those households that have not yet installed a heat pump, 20% report that they cannot afford one, while 18% indicate that they were not aware of the technology or that it was an option for them.

Of the policy measures included, respondents expressed lowest levels of support for taxing energy use, at 38% overall, ranging from 30% in France to 49% in Switzerland. Those expressing the greatest opposition to tax-based policy measures also have low levels of environmental concern and lack of confidence in the national government. Respondents expressed a high level of support for energy efficiency standards (71%), and two-thirds support subsidies to low-income households to help them pay for energy-efficiency equipment.

These findings point to a range of potential policy options to encourage more sustainable energy choices:

- **Increasing the availability and feasibility of sustainable options**: this could involve measures to incentivise the installation of energy efficiency equipment for landlords as well as homeowners, which would allow more consumers to choose these options.

- **Reducing adoption costs for households**: this could remove financial barriers to uptake of low-emissions energy options for some households. Policy measures could include, for example, subsidies for the installation of energy efficiency equipment.

- **Raising awareness of conservation practices and available technologies**: this could result in greater energy saving behaviour and uptake of low-emissions technologies, especially for those that consumers may be less aware of, such as heat pumps and battery storage. Potential measures could include reminders about energy consumption, practical tips on how to save more energy and general awareness campaigns.

1.4.2. Transport

While reliance on cars is higher in rural areas, car use is still significant even in urban areas where it accounts for 50% of commuter travel. Across the nine countries surveyed, 75% of households report that at least one household member uses a conventional private car on a regular basis. Car use does not vary significantly by level of environmental concern, highlighting households' car dependence and the constraints and inconveniences associated with changing this behaviour. However, 54% of respondents indicate that improved public transport services, including lower public transport fares, more frequent service and better network coverage, would encourage them to reduce their car use. Increasing the availability of public transport options is an important component of efforts to decarbonise the transport sector (see Chapter 3).

Insufficient charging infrastructure appears to be a barrier to greater electric car uptake for survey respondents. The large majority of respondents (more than 80%) that plan to buy a car within the next couple of years expect this to be a car that runs at least partially on fossil fuels. Overall, 33% of respondents report that there are no charging stations for electric cars within three kilometres of their home, ranging from 22% in the Netherlands to 43% in France. The majority of electric car users in the sample report that they charge their car at a location where it is normally parked.

In line with a general lack of support for taxes, the majority of all respondents were opposed to deterrent measures, such as having to pay a fee for every kilometre driven (57%) and increased parking fees (61%). However, investing in public transport systems enjoys widespread support in all countries, ranging from 72% of respondents in the United States to 84% in Israel. Subsidies for low-emissions vehicles are strongly supported by 24% of respondents.

Based on these observations, a number of policy options to encourage more sustainable mobility choices could be considered:

- **Improving public transport systems**: this could incentivise households to reduce car use, and could include investments to improve the frequency, accessibility and affordability of public transport systems.
- **Increasing the availability of charging infrastructure**: as a complement to other measures, this could increase the adoption of electric cars, especially in areas where there are fewer alternatives to car use.
- **Complementing taxes or other charges on car use with investments in public transport and better walking and cycling infrastructure**: this could make such policies more acceptable in light of widespread support for public transport improvements.

1.4.3. Waste practices

Household actions to reduce waste generation (e.g. reusing and repairing) are an important component of waste management (Chapter 4). Survey results suggest that households act to reduce waste by engaging in low-effort activities, but struggle to change their consumption habits. More than half of households report taking action to reduce and reuse: 83% of households report always or often using reusable shopping bags, 53% report frequently using refillable containers, 55% report repairing damaged items and 51% report buying products that are less environmentally harmful. However, considerably fewer households report frequently buying second-hand items (37%), renting or borrowing items (22%) and making things at

home (20%), indicating scope to increase engagement in these practices. Survey responses suggest, for example, that concern for the environment can be leveraged in efforts to increase demand for less environmentally damaging items.

The amount of recycling reported by households for all materials ranges from 34% in Israel to 71% in Switzerland. Lower rates are generally reported for composting food waste (ranging from 27% in Israel to 58% in Sweden) and recycling batteries (27% in Israel to 71% in Switzerland). Recycling collection services and charging schemes for mixed waste disposal are associated with lower discarded mixed waste and higher recycling rates. Households with access to drop-off points for recycling produce on average 26% less mixed waste per capita than those with no recycling service available, and households with door-to-door or kerbside collection produce 42% less discarded mixed waste.

Charging for mixed waste disposal is associated with more separation of food waste for composting in six out of nine countries. Overall, households being charged a per-unit fee for mixed waste disposal report composting 55% of their food waste, while those that are not charged report composting 35% of their food waste. A significant proportion of respondents in many countries report not being charged for disposal services (e.g. up to 41% in Israel). However, households' knowledge of how they are charged is likely to be imperfect. In addition, households report that greater financial incentives (43%), the option to have waste collected at home (37%) and more accessible recycling collection or drop-off services (39%) would encourage them to recycle and compost more. Widespread agreement that financial incentives would influence household waste practices highlights the potential for deposit-refund systems in reducing mixed waste generation.[5]

Information provision could also help to reduce waste generation and increase recycling. Up to 16% of households in Israel dispose of electric and electronic waste along with mixed waste, which could be due to lack of information on how or where to recycle them. As for food waste, the main reasons that respondents cited for throwing food away were because they forgot about it (36%) or cooked or bought too much (22%). Clarifying and standardising date labels, providing information on what can be frozen and for how long, as well as providing shopping or portion plans, were all identified by respondents as likely to be effective in helping them to reduce food waste. Many households that compost at least some food waste cite a lack of space (27%) and perceived unpleasantness (17%) as the main reasons for not composting more. Measures to provide households with equipment for composting and food waste collections could address some of these issues to increase composting rates.

The policy implications of these results suggest several measures that policymakers can take to reduce waste generation and encourage greater recycling and composting:

- **Providing better recycling services is important for reducing waste**: this could lead to lower levels of mixed waste generation and greater sorting. Collecting recyclable materials from households' residences appears to be most effective in this regard.
- **Expanding charging schemes for mixed waste disposal and improving awareness of these schemes**: this could also yield increases in recycling and reductions in generated waste. One example is per-unit (i.e. volume or weight-based) charges.
- **Providing better information on what to recycle and compost and how**: this could lift some reported barriers to greater engagement in recycling and composting. Examples include information on where to recycle batteries, and how to avoid food waste.

1.4.4. Food consumption

Affordability, freshness, taste and nutritional value figure among consumers' top priorities when making food purchases in the nine surveyed countries (Chapter 5). The environmental impacts of food products are reportedly less important, even among those who are environmentally concerned. This suggests that policies aimed at shifting dietary choices to more sustainable food items need to consider these priorities

(e.g. cost and taste). For sustainable food products (e.g. plant-based foods) that are inexpensive relative to less sustainable foods, this could involve campaigns emphasising their affordability, as well as their health benefits.

Overall, 24% of households consume red meat several times per week, ranging from 18% in the Netherlands to 34% in the United States. The frequency with which respondents consume meat varies more by income than by environmental concern. Consumption of white meat tends to be more frequent and varies slightly more across countries, while seafood is generally consumed less frequently and with even greater variability. Dairy products are the most frequently consumed animal product, with an average of 69% of households consuming them several times a week,[6] ranging from 60% in Belgium to 76% in Sweden. Given the significant environmental impacts of producing red meat, a policy focus on encouraging shifts to sustainable alternatives can yield large-scale environmental benefits.

Between 20% and 41% of respondents (in France and Israel, respectively) indicate that they would be willing to substitute conventional meat with a lab-grown alternative. Those who would not be willing cite reservations about the potential health impacts of lab-grown meat, its presumed inferior taste and nutritional value, high cost, and incompatibility with their culture or values. Supply-side production standards and environmental labelling of meat alternatives will be important measures to increase consumer confidence in new, more sustainable food products such as lab-grown meat.

Reported regular consumption of organic food ranges from 11-31% depending on the country. In all countries, environmental concern appears to be associated with the likelihood of purchasing organic food, as well as to consuming products that are in season and locally produced.

The survey asked respondents if they would support a range of food-related policies, including educational programmes, regulations on the use of pesticides, and incentives to encourage sustainable agricultural practices. With the exception of a tax on meat or seafood, there was broad support for nearly all the food-system policies treated in the survey, ranging between 71% and 78%, depending on the policy. These high levels of support should empower policymakers to take action to induce shifts to more sustainable diets, for example by:

- **Improving the affordability, availability, nutrition and taste of sustainable options**: these are universally important priorities for consumers when making food purchases and enhancing these characteristics could increase the appeal of sustainable food items among consumers.

- **Providing more information on the benefits of sustainable alternatives to meat and dairy**: this could reduce potential misconceptions about their cost or quality. Examples include labelling schemes and certification programmes to increase consumer knowledge on the environmental impacts of food products, as well as information about the lower cost of plant-based foods, as appropriate, or the attributes of lab-grown meat.

- **High levels of support for many food-system policies suggest that households may be relatively receptive towards policies that aim to induce shifts to more sustainable diets.** Support is highest for educating school children about sustainable diets, providing incentives for farmers to reduce environmentally harmful agricultural practices, and stricter regulation of pesticide use, industrial animal farming and aquaculture.

References

Bateman, I. et al. (2002), *Economic valuation with stated preference techniques: a manual*, Edward Elgar Publishing Ltd. [18]

Blake, J. (2007), "Overcoming the 'value-action gap' in environmental policy: Tensions between national policy and local experience", *https://doi.org/10.1080/13549839908725599*, Vol. 4/3, pp. 257-278, https://doi.org/10.1080/13549839908725599. [11]

Blankenberg, A. and H. Alhusen (2019), "On the Determinants of Pro-Environmental Behavior: A Literature Review and Guide for the Empirical Economist", *SSRN Electronic Journal*, https://doi.org/10.2139/SSRN.3473702. [14]

Bogliacino, F., F. Montealegre and F. Folkvord (2020), "Negative shocks predict change in cognitive function and preferences: Assessing the negative affect and stress hypothesis in the context of the COVID-19 pandemic", https://osf.io/preprints/socarxiv/qhkf9/ (accessed on 19 November 2020). [31]

Brown, Z. and N. Johnstone (2014), "Better the devil you throw: Experience and support for pay-as-you-throw waste charges", *Environmental Science & Policy*, Vol. 38, pp. 132-142, https://doi.org/10.1016/J.ENVSCI.2013.11.007. [35]

Cassar, A., A. Healy and C. von Kessler (2017), "Trust, Risk, and Time Preferences After a Natural Disaster: Experimental Evidence from Thailand", *World Development*, Vol. 94, pp. 90-105, https://doi.org/10.1016/j.worlddev.2016.12.042. [32]

Creutzig, F. et al. (2021), "Demand-side solutions to climate change mitigation consistent with high levels of well-being", *Nature Climate Change*, Vol. 12/1, pp. 36-46, https://doi.org/10.1038/s41558-021-01219-y. [8]

Dangelico, R., V. Schiaroli and L. Fraccascia (2022), "Is Covid-19 changing sustainable consumer behavior? A survey of Italian consumers", *Sustainable Development*, https://doi.org/10.1002/SD.2322. [33]

de Palma, A., S. Vosough and F. Liao (2022), "An overview of effects of COVID-19 on mobility and lifestyle: 18 months since the outbreak", *Transportation Research Part A: Policy and Practice*, Vol. 159, pp. 372-397, https://doi.org/10.1016/J.TRA.2022.03.024. [29]

Dechezleprêtre, A. et al. (2022), "Fighting climate change: International attitudes toward climate policies", *OECD Working Paper No. 1714*, https://doi.org/10.1787/3406f29a-en. [25]

Douenne, T. and A. Fabre (2020), "French attitudes on climate change, carbon taxation and other climate policies", *Ecological Economics*, Vol. 169, p. 106496, https://doi.org/10.1016/j.ecolecon.2019.106496. [28]

Dubois, G. et al. (2019), "It starts at home? Climate policies targeting household consumption and behavioral decisions are key to low-carbon futures", *Energy Research & Social Science*, Vol. 52, pp. 144-158, https://doi.org/10.1016/j.erss.2019.02.001. [9]

E. S. Brondizio et al. (eds.) (2019), *Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*, IPBES Secretariat, Bonn, Germany, https://doi.org/10.5281/ZENODO.6417333. [3]

Hanaoka, C. et al. (2011), "Do Risk Preferences Change? Evidence from the Great East Japan Earthquake †", *American Economic Journal: Applied Economics*, Vol. 10/2, pp. 298-330, https://doi.org/10.1257/app.20170048. [30]

Homonoff, T. (2018), "Can Small Incentives Have Large Effects? The Impact of Taxes versus Bonuses on Disposable Bag Use", *American Economic Journal: Economic Policy*, Vol. 10/4, pp. 177-210, https://doi.org/10.1257/POL.20150261. [7]

IEA (2022), *A 10-Point Plan to Cut Oil Use – Analysis - IEA*, International Energy Agency, https://www.iea.org/reports/a-10-point-plan-to-cut-oil-use (accessed on 21 April 2022). [4]

IPCC (2023), *Climate Change 2023: Synthesis Report. A Report of the Intergovernmental Panel on Climate Change. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland, https://report.ipcc.ch/ar6syr/pdf/IPCC_AR6_SYR_LongerReport.pdf (accessed on 27 March 2023). [20]

IPCC (2022), *Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, IPCC, https://doi.org/10.1017/9781009157926. [1]

IRENA (2022), *Renewable Power Generation Costs in 2021*, International Renewable Energy Agency, https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2022/Jul/IRENA_Power_Generation_Costs_2021.pdf?rev=34c22a4b244d434da0accde7de7c73d8 (accessed on 6 March 2023). [22]

Kaufman, S. et al. (2021), "Behaviour in sustainability transitions: A mixed methods literature review", *Environmental Innovation and Societal Transitions*, Vol. 40, pp. 586-608, https://doi.org/10.1016/j.eist.2021.10.010. [12]

Lauren, N. et al. (2016), "You did, so you can and you will: Self-efficacy as a mediator of spillover from easy to more difficult pro-environmental behaviour", *Journal of Environmental Psychology*, Vol. 48, pp. 191-199, https://doi.org/10.1016/j.jenvp.2016.10.004. [34]

Mourato, S. and G. Shreedhar (2021), "Conducting economic valuation surveys during extreme events", *OECD Environment Working Papers*, No. 187, OECD Publishing, Paris, https://doi.org/10.1787/85477cd9-en. [17]

OECD (2022), *Global Plastics Outlook: Economic Drivers, Environmental Impacts and Policy Options*, OECD Publishing, Paris, https://doi.org/10.1787/de747aef-en. [21]

OECD (2022), *OECD Economic Outlook, Volume 2022 Issue 1: Preliminary version*, OECD Publishing, Paris, https://doi.org/10.1787/62d0ca31-en. [24]

OECD (2021), *OECD Economic Outlook, Volume 2021 Issue 2*, OECD Publishing, Paris, https://doi.org/10.1787/66c5ac2c-en. [23]

OECD (2019), *Accelerating Climate Action: Refocusing Policies through a Well-being Lens*, OECD Publishing, Paris, https://doi.org/10.1787/2f4c8c9a-en. [5]

OECD (2018), *Cost-Benefit Analysis and the Environment Further Developments and Policy Use: PART I Discrete choice experiments*, OECD Publishing, https://doi.org/10.1787/9789264085169-en. [19]

OECD (2015), *Deposit-Refund Systems: Design and Implementation*, OECD Publishing, Paris, https://doi.org/10.1787/9789264244542-7-en. [36]

OECD (2014), *Greening Household Behaviour: Overview from the 2011 Survey - Revised edition*, OECD Studies on Environmental Policy and Household Behaviour, OECD Publishing, Paris, https://doi.org/10.1787/9789264214651-en. [16]

OECD (2011), *Greening Household Behaviour: The Role of Public Policy*, OECD Studies on Environmental Policy and Household Behaviour, OECD Publishing, Paris, https://doi.org/10.1787/9789264096875-en. [15]

Poore, J. and T. Nemecek (2018), "Reducing food's environmental impacts through producers and consumers", *Science*, Vol. 360/6292, https://doi.org/10.1126/science.aaq021. [6]

Poortinga, W. et al. (2019), "Climate change perceptions and their individual-level determinants: A cross-European analysis", *Global Environmental Change*, Vol. 55, pp. 25-35, https://doi.org/10.1016/j.gloenvcha.2019.01.007. [26]

Sorrell, S. (2015), "Reducing energy demand: A review of issues, challenges and approaches", *Renewable and Sustainable Energy Reviews*, Vol. 47, pp. 74-82, https://doi.org/10.1016/j.rser.2015.03.002. [13]

van Valkengoed, A., W. Abrahamse and L. Steg (2022), "To select effective interventions for pro-environmental behaviour change, we need to consider determinants of behaviour", *Nature Human Behaviour 2022 6:11*, Vol. 6/11, pp. 1482-1492, https://doi.org/10.1038/s41562-022-01473-w. [10]

Warren, P. (2018), "Demand-side policy: Global evidence base and implementation patterns", *Energy & Environment*, Vol. 29/5, pp. 706-731, https://www.jstor.org/stable/90023919 (accessed on 18 May 2022). [2]

Whitmarsh, L. and S. Capstick (2018), "Perceptions of climate change", in *Psychology and Climate Change*, Elsevier, https://doi.org/10.1016/b978-0-12-813130-5.00002-3. [27]

Notes

[1] Further discussion on the advantages and disadvantages of stated preference empirical approaches are discussed in Annex A.

[2] What is a primarily non-financial compromise for some respondents may be a financial compromise for other respondents. For example, while using public transport instead of a private car may entail non-financial costs (e.g. lower comfort) for a respondent living in an urban area, not using a car would entail financial costs for a rural resident who depends on a car for commuting.

[3] Differences in samples as well as in the formulation of some questions prevents direct comparisons of the results across survey rounds.

[4] The survey provides information on a host of factors that can help to explain variation in policy support across policy measures and countries, such as gender, income, residential features, employment status, age, household size, and education. A more comprehensive analysis that isolates the impact of individual drivers on policy support is beyond the scope of this report, however.

[5] Although the EPIC Survey does not provide information on the coverage or effectiveness of deposit-refund systems, other research suggests that well-designed systems can be effective (OECD, 2015[36]).

[6] Frequency is one measure of intensity of consumption. Other measures include expenditure as a percent of total food spending or caloric intake.

2 Household behaviour and residential energy use

Households worldwide account for nearly a quarter of all energy use globally, with OECD household energy use responsible for 14% of all OECD carbon dioxide emissions in 2019. This chapter analyses responses from the third round of the OECD Survey on Environmental Policies and Individual Behaviour Change (EPIC) on households' residential energy use in nine OECD countries. It reviews the main energy sources used by households; their uptake of renewable and low-emissions options; and the barriers to further uptake. It also explores the extent to which households act to conserve energy, and their views on the policies that would encourage them to reduce their own energy use. Finally, it presents respondents' support for energy-related policies, including energy efficiency standards; subsidies for housing renovation, purchasing energy-efficient appliances or investing in renewable energy equipment; and energy taxes.

Key findings

- **There appears to be substantial unmet demand for low-emissions energy options, indicating scope to increase the availability and awareness of these options.** For example, 39% of respondents report that their provider has not offered the option to use electricity generated from renewable energy sources, but that they would be interested in this option if it were available. Uptake of low-emissions heating and cooling options (i.e. solar panels, heat pumps, or electricity generated from renewables) also appears to differ by housing ownership status and dwelling type, indicating some barriers to their uptake. For example, 17% of those who live in houses use low-emissions heating and cooling options versus 11% of those living in apartment buildings. Supply-side measures such as renewable energy mandates, could increase the availability of low-emissions options, while demand-side measures such as information provision and government support for the installation of equipment, could increase uptake.

- **Reducing the installation costs and increasing awareness of low-emissions energy technologies could boost their uptake.** The availability and adoption of low-emissions energy technologies could be higher. Overall, 43% of households report having installed low-emissions technologies in their household. Installation rates are highest for low-energy lightbulbs (87%), energy-efficient appliances (66%) and energy-efficient windows (58%). Of respondents for whom installation is feasible, less than a third report having installed solar panels (29%), heat pumps (30%) and battery storage (27%). Affordability and lack of awareness appear to be significant barriers to the installation of these technologies, as cited by around a fifth of respondents for whom installation is feasible. This points to the potential role of government support for installing low-emissions technologies and enhancing public awareness of these technologies. There also appears to be scope for consumers to make better use of available technologies. For example, 52% of respondents with smart meters report not using the information provided to help them optimise energy use.

- **Measures to encourage energy conservation could include providing better information on how to save energy, as well as reminders to do so.** Overall, 28% of households report that they do not frequently act to save energy, especially actions that imply higher costs, effort or discomfort. For example, while 92% often or always turn off the lights when leaving a room, 68% of respondents report often or always minimising the use of heating or cooling. Of the total number of reasons cited for not engaging more in such behaviours, 54% of reasons involve either forgetfulness, a lack of awareness and difficulty in changing one's behaviour.

- **Over 70% of respondents approve of subsidies to individuals for energy efficiency improvements, investing in renewable energy equipment, and implementing energy efficiency standards.** There is less support for taxing energy use (38%), ranging from 30% in France to 49% in Switzerland. Those expressing the greatest opposition to tax-based policy measures also indicate low environmental concern and lack of confidence in national government. These findings indicate the importance of efforts to address public concerns in the design of policy instruments (e.g. by mitigating distributional concerns) and to clarify the purpose of tax-based energy policies and the use of the revenues generated.

2.1. Introduction

The amount and type of energy consumed by the residential sector is of substantial environmental and economic consequence. In 2019, households worldwide consumed 88 million terajoules (TJ) of energy for residential uses, making up nearly a quarter of total final energy use globally (IEA, 2022[1]). This proportion ranged from 19-21% across OECD countries and has remained relatively stable over time (IEA, 2022[1]). In terms of carbon footprint, global household energy use in 2019 was responsible for 11% of global CO_2 emissions and 14% of emissions from OECD countries (IEA, 2022[1]). Households make a larger relative contribution to total energy use than to total CO_2 emissions because electricity constitutes a larger share of the energy mix in the residential sector relative to other sectors. The energy that households use for space heating, water heating and cooking can be supplied by primary energy sources such as oil products, natural gas and traditional biomass, as well as by electricity. While the use of all energy sources generates greenhouse gas emissions and local air pollution, electricity use tends to have a lower carbon footprint than primary energy sources since it can be generated by renewable energy sources such as solar and wind.

The proportion of electricity generated by renewable energy sources is expanding. In 2015, 23% of global electricity supply was generated by renewables. This figure rose to 28% in 2021 and is expected to reach 38% in 2027 (IEA, 2022[2]). However, renewable electricity generation can also have broader environmental implications, such as for local land use, and through the manufacturing, use and disposal of related equipment, such as batteries. The combination of energy sources that countries use depends on the availability of different types of sources, the amount and distribution of domestic energy demand, as well as historical, economic, environmental and geopolitical conditions.

The amount of energy that households consume is highly correlated with population and income growth. Between 1990 and 2019, household energy and electricity consumption grew at an annual rate of 1.15% and 3.1%, respectively (IEA, 2021[3]). Evidence suggests that overall energy consumption is decoupling from economic growth in many countries (OECD, 2021[4]; Guo, Li and Wei, 2021[5]). However, the growth rates above suggest that although per capita energy use in the residential sector has remained almost stable, per capita electricity consumption has continued to increase. The International Energy Agency (IEA) estimates that between 2000 and 2019, per capita demand for electricity grew at an annual rate of 1.6% (IEA, 2021[3]).[1] For OECD countries, where household access to the standard electricity grid is high, this growth was driven by the replacement of oil with electricity for heating, the addition of new electric devices and an intensified use of existing devices. Globally, growth in the demand for electricity is also driven by an increase in the number of households that have access to electricity grids. Overall, the continued increase in per capita electricity consumption suggests that energy efficiency improvements appear to be offset by increased electricity use.

A mix of technological advances, policy support measures and behavioural adjustments is therefore necessary to reduce the environmental impact of residential energy use. This will entail a shift from polluting primary energy sources to electricity to deliver residential energy needs. In tandem, electricity generation itself will also need to rely to a greater extent on renewables, a development that will depend on both increased capacity as well as increased demand by households. Household efforts to reduce energy use and install low-emissions energy technologies (e.g. energy saving appliances and battery storage) will also help to smooth electricity demand over time, further facilitating the use of renewable energy sources. A green energy transition will also be facilitated by the use of local mini- and micro-grids, as well as off-the-grid solutions aiming to improve the reliability of the supply of low-carbon electricity.

Evidence suggests that demand-side measures can effectively reduce greenhouse gas (GHG) emissions from residential energy use. Measures that reduce energy use in residential buildings, such as effective thermal insulation, renewable energy sources and energy-efficient household appliances have been found to have the highest potential (30-70%) in reducing GHG emissions from the buildings sector (Creutzig et al., 2022[6]). Behavioural and social practices specifically could contribute 15% in emissions reductions by 2050. Infrastructure changes, such as compact urban planning, reducing floor space and low carbon architectural design could reduce emissions by an estimated 20% (IPCC, 2022[7]). The potential of improving energy efficiency and increasing engagement in energy conservation to further reduce GHG emissions at relatively low costs, is not a new finding (ACEEE, 2013[8]). And while much progress has been made, accelerating behavioural change remains a challenge and key priority for urgent action on climate change and broader environmental protection.

This chapter provides an overview of the data gathered by the third OECD Survey on Environmental Policies and Individual Behaviour Change (EPIC) on household decisions related to energy use.[2] Previous rounds of the survey were implemented in 2008 and 2011. In 2022, the EPIC Survey explores:

- households' energy sources, including conventional and renewable sources, and their use of low-emissions heating and cooling
- availability, adoption and barriers to adoption of low-emissions energy technologies
- households' actions to conserve energy
- households' support for energy-related policies.

For each of these areas, the chapter uses representative country samples to analyse differences in households' behaviours and attitudes across relevant variables, such as income level, residence type and location, ownership status and level of environmental concern.

2.2. Household energy sources

2.2.1. Use of electricity vs. fossil fuels as primary energy sources

While respondents indicated using a variety of energy sources for heating and cooling their homes, the majority report either using electricity from the standard grid or gas (Figure 2.1). The highest percentage of households using electricity for heating and cooling their homes occurs in Israel. Sweden and Switzerland are characterised by a significantly higher share of households using electricity to power heat pumps for heating and cooling (11% and 12%, respectively). Apart from a slight increase in the use of heat pumps and district heating since 2011, there appear to be no significant changes in the distribution of heating and cooling systems in countries that participated in the 2011 survey (Canada, France, Israel, the Netherlands, Sweden and Switzerland) over time.[3] Overall, 12% of surveyed households report using low-emissions heating or cooling, which refers to heating or cooling that is supplied exclusively by electricity from renewable sources, heat pumps or solar energy.

Figure 2.1. Conventional electricity and gas are the main sources of space heating and cooling

Relative proportion of each response option
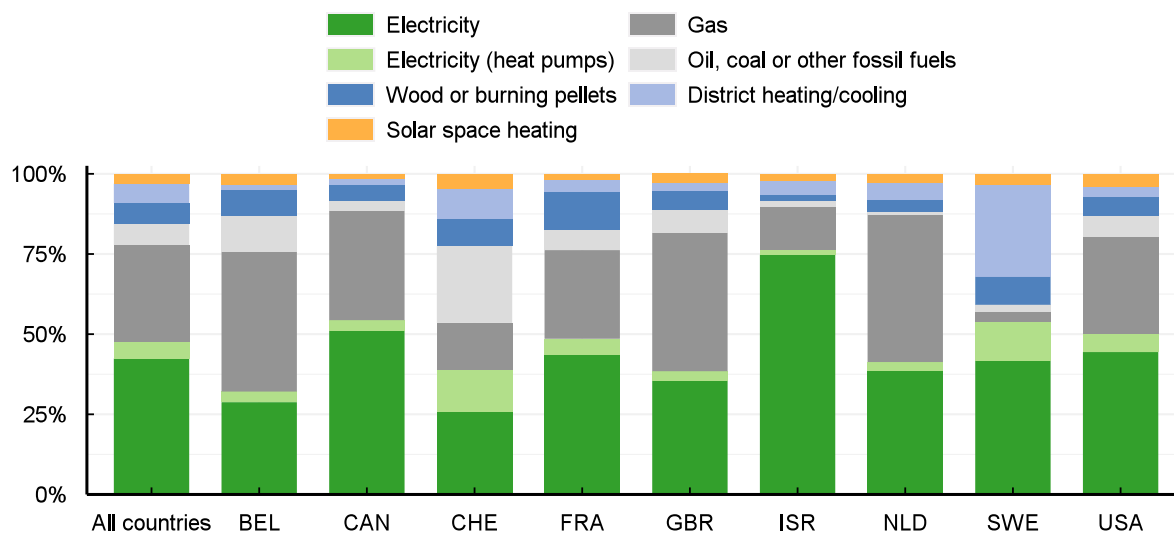
Note: This survey item asked respondents: "Which of the following energy sources do you use for space heating/cooling? Please select all that apply." Respondents were able to select multiple responses except when selecting "Don't know". The proportion of "other" and "don't know" responses are minimal and are not displayed in the figure.
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ⁊ˢ᾿ https://stat.link/tuyj4x

For heating water, most respondents (69%) also report using electricity from the standard grid or gas. Israel, Sweden and Switzerland are outliers. In Israel, the main energy sources for water heating are electricity (51%) and solar (30%); in Sweden, electricity (38%) and district heating and cooling (25%); and in Switzerland, electricity (30%), heat pumps (13%) or oil or coal (15%). The energy sources used for cooking exhibit less variation. Respondents in most countries report using either electricity or gas. The greatest proportion of households that report using electricity is in Switzerland (90%), while Israel has the greatest share for gas (60%).

The proportion of a household's income that is spent on electricity is indicative of their energy cost burden, especially for households that heat or cool using electricity. Electricity cost burdens in the sample range between 2% and 5% of household income, with a median of 2.8% across countries (Figure 2.2). Lowest median values are 2% for Switzerland, Israel and the United States, and the highest median value of 5% is reported in Canada and the United Kingdom. The large range evidenced by the survey data warrants further investigation into the factors that drive spending on electricity. Existing evidence suggests that electricity cost burdens can be impacted by factors such as the number of people living in the household, dwelling size, climate, energy policies, energy prices and energy-use behaviours (Durišić et al., 2020[9]). Variations in these factors will contribute to explaining variations observed at the country level.

Figure 2.2. The median electricity burden ranges from 2% to 5% across countries

Percent of net monthly income spent on electricity
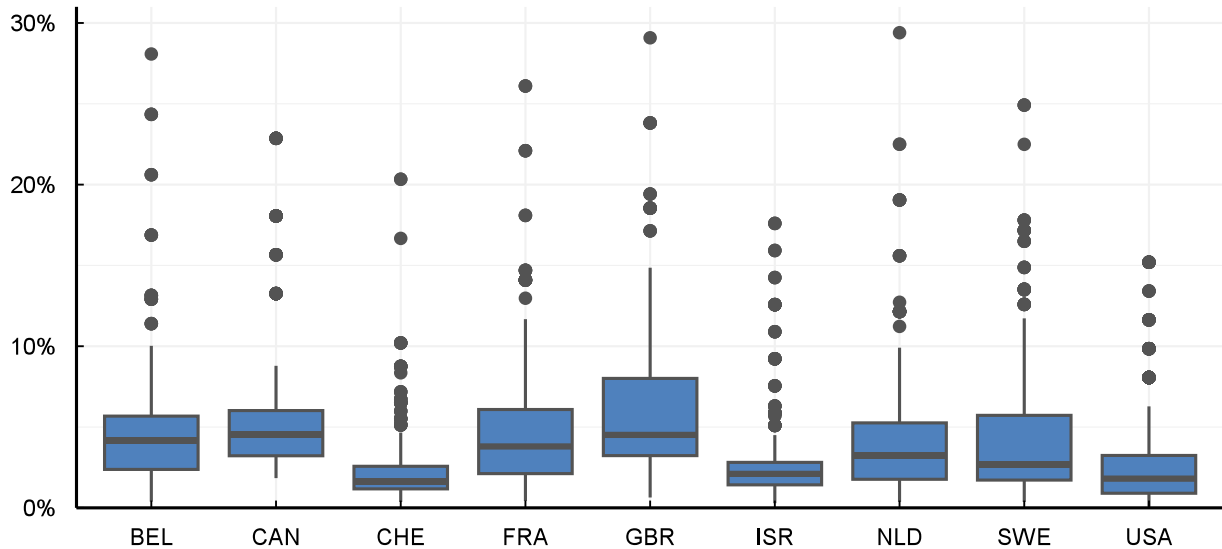
Note: Each household's electricity bill burden is calculated as the average monthly electricity bill divided by average net monthly income. Horizontal lines in boxes represent from bottom to top, the 25th, 50th and 75th percentiles. The vertical lines (i.e. the "whiskers") represent minimum (bottom) and maximum (top) values (calculated as first quartile - 1.5 × interquartile range and third quartile + 1.5 × interquartile range). Dots are potential outliers. 16 outliers with values above 30% are not shown in the graph or used for the calculations of the median values. Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink 🔗 https://stat.link/eaj18t

With the exception of Sweden, there appears to be little difference in overall electricity cost burdens between households that use low-emissions heating (i.e. solar space heating, heat pumps, or grid-supplied electricity generated from renewable sources) and those that use fossil-fuel based energy sources for heating (Figure 2.3). Although many factors contribute to determining electricity cost burdens, this result could suggest that the cost-related barriers to using low-emissions heating options are primarily due to the high upfront costs of installation rather than ongoing costs related to household electricity use.[4] Other differences that could be present across households that use conventional vs. low-emissions heating and cooling (e.g. differences in income) will also need to be taken into account in order to isolate the impact that low-emissions heating and cooling may have on energy cost burdens. The fact that installation costs are typically recovered over time may also explain why their use tends to be most frequently reported among homeowners rather than tenants.

Figure 2.3. The electricity cost burden of low-emissions and conventional heating is similar

Respondents' electricity bill as a percentage of income
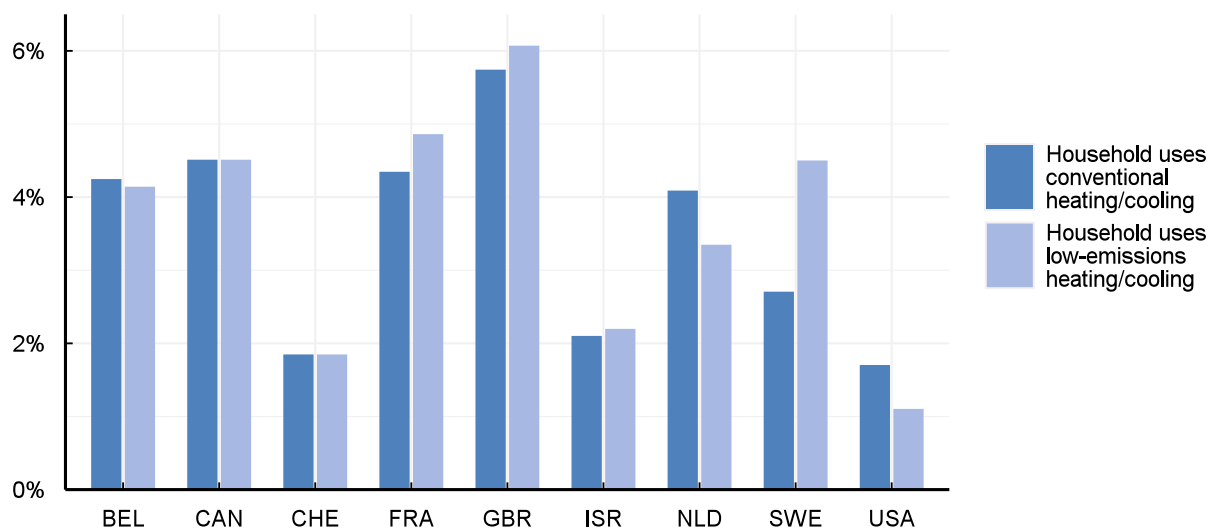
Note: This survey item asked respondents: "How much was the average monthly cost for the electricity used by your primary residence over the past year?" Country-specific response options were provided. Each respondent's electricity bill burden is calculated as the average monthly electricity bill divided by average monthly income. Out of a total sample of 6 454 observations, 16 outliers with electricity bill burdens above 30% are excluded. Low-emissions heating/cooling includes solar space heating, heat pumps, or electricity generated from renewable sources. Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ᵐˢᴾ https://stat.link/akzfd9

One measure that can reduce electricity cost burdens is the option of paying a lower rate for electricity that is consumed during off-peak hours of the day, i.e. differentiated electricity rates. The availability of this option varies across countries, ranging from 29% in the United Kingdom to 52% in France. Use of this option also varies: as few as 7% and 10% of households report using it in Israel and Sweden, respectively, while as much as 41% of households use it in France. The reported use of differentiated electricity rates does not appear to have changed significantly in countries that participated in the 2011 survey. As with renewable energy, there appears to be considerable unmet demand for this option. Overall, 33% of respondents indicate that they have not been provided the option of selecting differentiated electricity rates, but that they would be interested in it if it was available (Figure 2.4).

Figure 2.4. Differentiated electricity rates could be adopted by more households

Percentage of respondents being offered differentiated electricity rates by their electricity provider
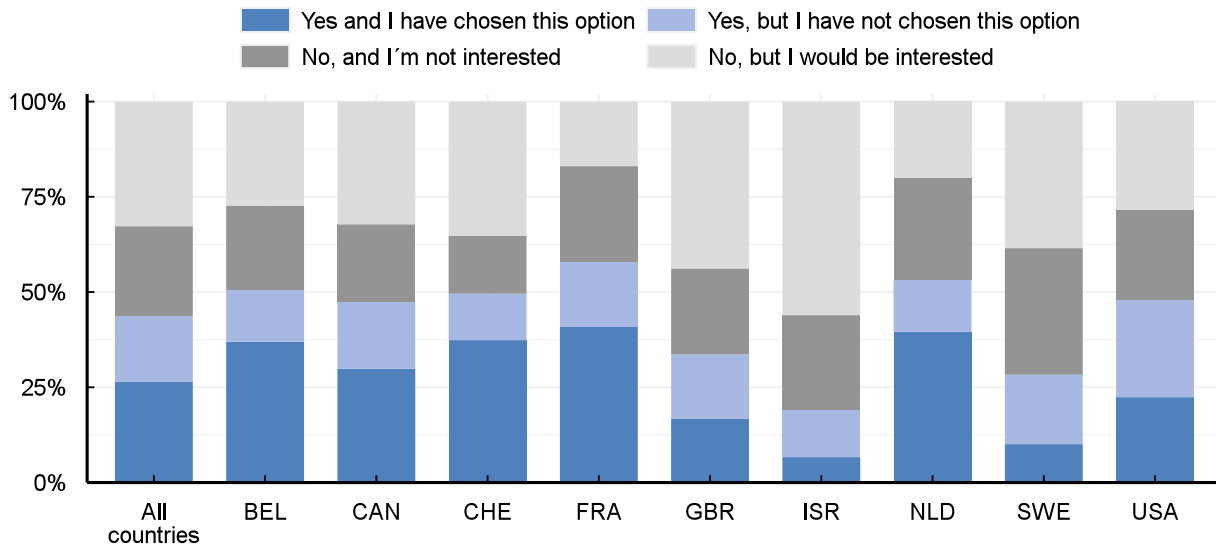
Note: This survey item asked respondents "Have any of the following been proposed to you by your electricity provider?"' Response options included "Yes and I have chosen this option," "Yes, but I have not chosen this option," "No and I'm not interested" and "No, but I would be interested."
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink 📊 https://stat.link/176iaw

2.2.2. Use of renewably generated electricity from the grid

On average, 19% of households report using renewably generated electricity supplied on the grid (ranging from 5% in Israel to 33% in the Netherlands) (Figure 2.5). A comparison between the 2022 and 2011 survey suggests that renewably generated electricity has become more widely available to households in Canada, France, Sweden and Switzerland (OECD, 2013[10]).[5] Despite this, there appears to be continued unmet demand for renewably generated electricity: 64% of respondents report not having this option, with 39% of them saying that they would be interested in it if it were available. Supply-side regulations, such as renewable energy mandates, could make it more available. It should be noted that country-level results may mask regional differences in the development of renewable energy within countries arising from differences in subnational energy policies (e.g. in Ontario, Canada (CER, 2022[11])). Discrepancies between reported and actual availability of renewable electricity options could indicate a lack of consumer awareness about such options. To this end, information provision regarding the availability of renewable electricity options could also increase their uptake.

Figure 2.5. A large share of households would like electricity generated from renewable sources

Percentage of respondents reporting being offered electricity generated by renewable energy sources by their electricity provider

Note: This survey item asked respondents "Have any of the following been proposed to you by your electricity provider?'" Response options included "Yes and I have chosen this option," "Yes, but I have not chosen this option," "No and I'm not interested" and "No, but I would be interested."
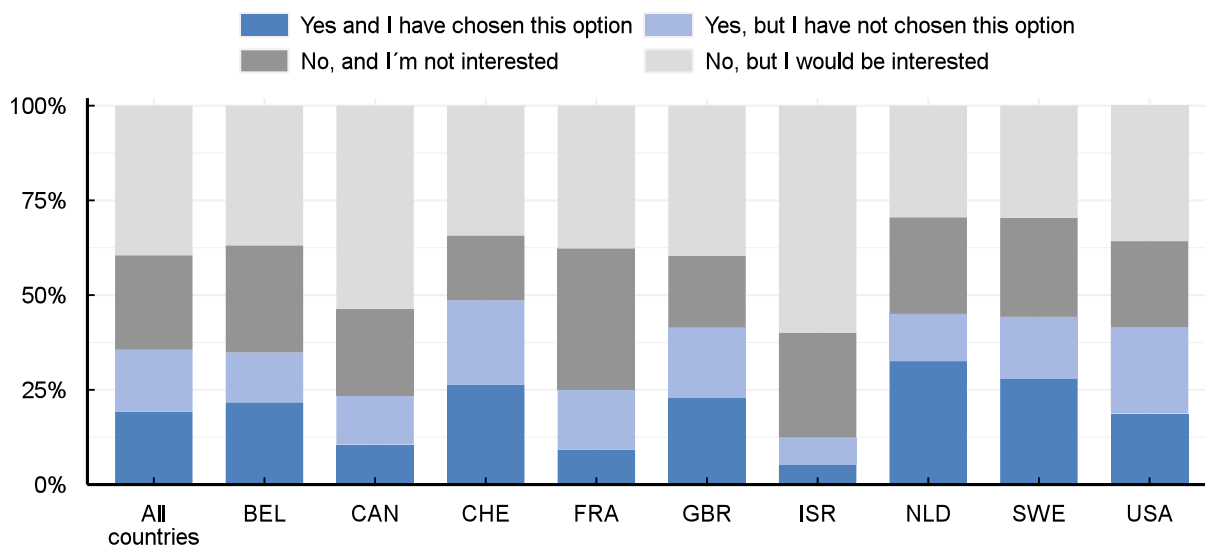Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink 🔗 https://stat.link/57aslp

2.3. Availability and use of low-emissions energy technologies

In the EPIC survey, low-emissions energy technologies include:

- technologies offered to households by their energy providers (smart meters, devices that automatically optimise energy use)
- low-emissions technologies chosen by households that lower emissions either by reducing energy use (low-energy lightbulbs, insulation, double or triple-glazed windows) or by obtaining energy from low-emissions sources (heat pumps, solar panels, battery storage).

2.3.1. Availability of low-emissions options supplied by electricity providers

In addition to enabling households to monitor their energy use, smart meters allow providers to offer differentiated electricity rates and make use of distributed generation and energy storage. Across countries, 27% of respondents report having been offered low-emissions technologies that help to optimise energy use (e.g. energy monitors) by their electricity providers, but only 12% have chosen to install these devices (top graph, Figure 2.6). Overall 45% of respondents report that they have been offered a smart meter and 28% report that they have installed one (bottom graph, Figure 2.6). Smart meters are reportedly least available in Israel, where only 12% of respondents report being offered one by their energy provider, and most available in the United Kingdom and the Netherlands (67%, and 71% respectively). Use of smart meters is lowest in Israel, at 5%, and highest in the Netherlands, at 58%. There appears to be substantial unmet demand for both smart meters and energy monitors: 42% of respondents report that they were not offered a device that optimises energy use but that they would be interested, while the figure for a smart meter is 33% (Figure 2.6).

Of respondents who reported having a smart electricity meter in 2022, 48% report that the information from the meter has helped them to reduce their electricity consumption. This confirms previous empirical results regarding the impact of smart meters on energy use (Rivers, 2018[12]; Aydin, Brounen and Kok, 2018[13]). Supply-side regulations to increase the provision of smart meters would facilitate their more widespread uptake among consumers. However, 27% of respondents indicate that they have not used the information provided by their smart meters, while 19% do not pay attention to the information, which suggests that there is also scope to improve smart meter use among those who have them. Providing better information on how to use smart meters would be important in improving their use.

Figure 2.6. There is large scope to increase the uptake of technologies that optimise energy use

Percentage of respondents being offered technologies that optimise energy use
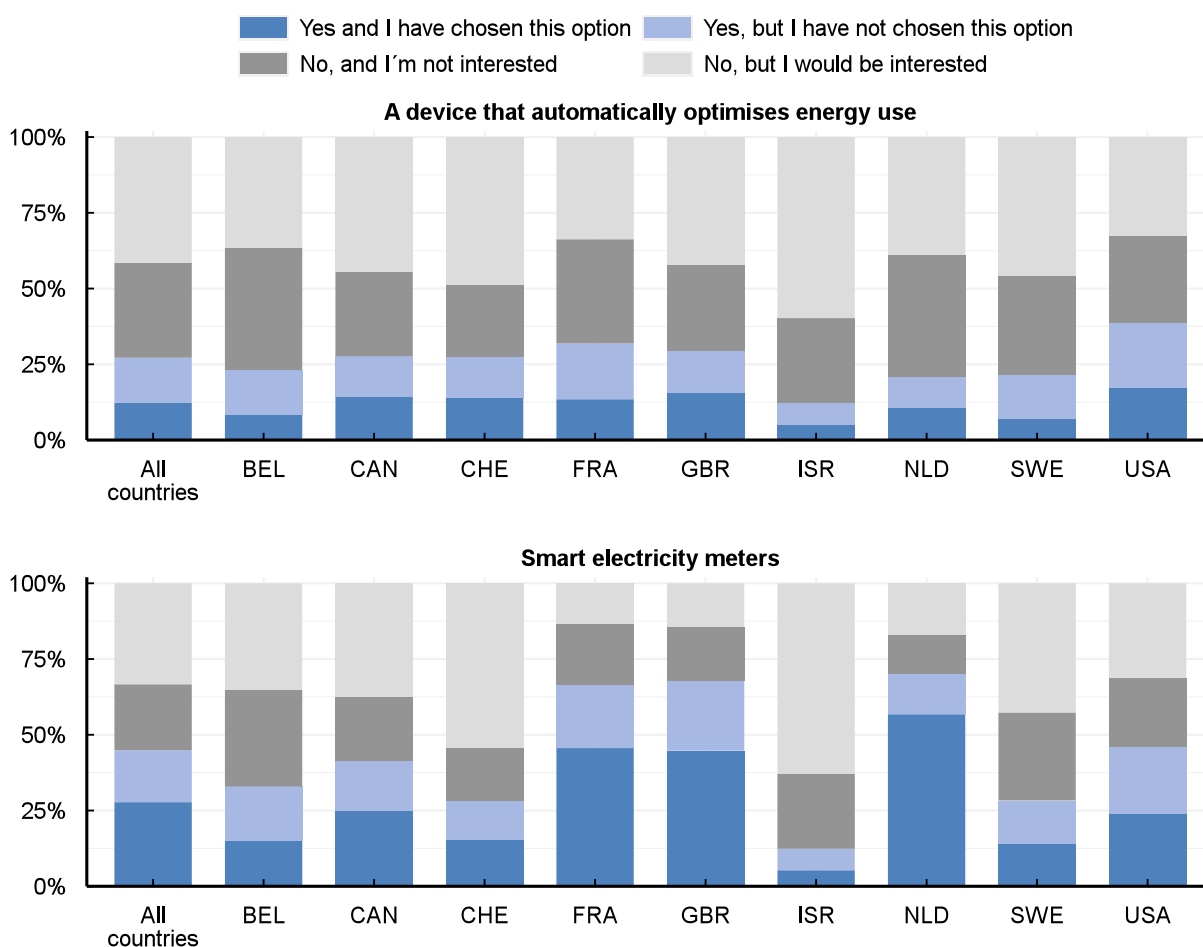
Note: This survey item asked respondents "Have any of the following been proposed to you by your electricity provider?'" Response options included "Yes and I have chosen this option," "Yes, but I have not chosen this option," "No and I'm not interested" and "No, but I would be interested."
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink 🔗 https://stat.link/ydp3lq

2.3.2. Household adoption of low-emissions energy technologies

Low-emissions energy technologies that households can independently choose to invest in include low-energy lightbulbs, energy-efficient appliances, energy-efficient windows, thermal insulation, solar panels for electricity, solar water heating, heat pumps and battery storage.[6] There is wide variation in installation rates across different types of technologies.

Figure 2.7. Installation of low-emissions technologies is not possible for many households

Percentage of respondents
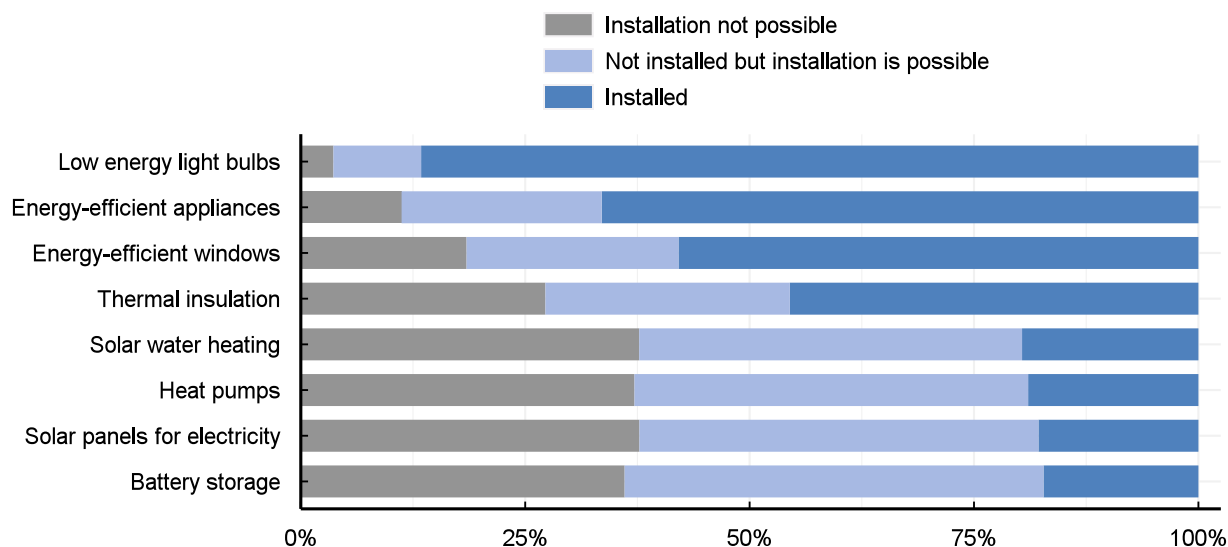
Note: These survey items asked respondents: "Have you installed any of the following items over the past ten years in your current primary residence?". Respondents who answered "Do not know" or "I am not aware of this or do not know if it is possible to install in my area/home" are not counted in the figure. Respondents who answered "No" were asked a follow-up question: "Why haven't you installed the following items?". For each type of equipment that they had not already installed over the past ten years, respondents selected the main reason why they had not done so. Respondents who selected "Already installed more than 10 years ago" are counted as having installed the equipment. Those that selected "I am planning to install this in the next two/three years", "I am interested but cannot afford it" or "I am not interested" are counted as "Possible to install". The remaining reason: "Not possible (not feasible in my house/ apartment area and/or my landlord would need to install this)" is counted as "Not possible".
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink 🖳🖩 https://stat.link/mt6g0l

Figure 2.8 reports the proportion of households, among those for whom installation is feasible,[7] that have installed low-emissions energy technologies with and without government support. Findings suggest that even where installation is feasible, overall uptake remains low for some types of equipment: i.e. solar panels (29%), heat pumps (30%) and battery storage (27%). There are three notable exceptions: the Netherlands, where 51% of respondents (among those for whom installation is feasible) have installed solar panels for electricity; Israel, where 92% of respondents have installed solar panels for water heating; and Sweden, where 58% have installed heat pumps. Although energy efficiency measures are generally cost-effective (IEA, 2022[14]), a number of factors can limit their uptake. These include fluctuations in energy prices, credit constraints, lack of information, split incentives between tenants and landlords, and behavioural biases (e.g. the tendency to prefer the status quo) (Ameli and Brandt, 2015[15]).

The adoption of thermal insulation and energy-efficient windows varies across countries, with a range of 39% to 73% for thermal insulation and 44% to 84% for energy-efficient windows. For other types of energy-efficiency equipment, such as highly energy-efficient appliances, most respondents have not benefitted from government support. Highly energy-efficient appliances are adopted by 75% among those that are able to do so (Figure 2.8).

Figure 2.8. A minority of households have received government support for the installation of low-emissions energy technologies

Percentage of households that received government support for the installation of low-emissions energy technologies
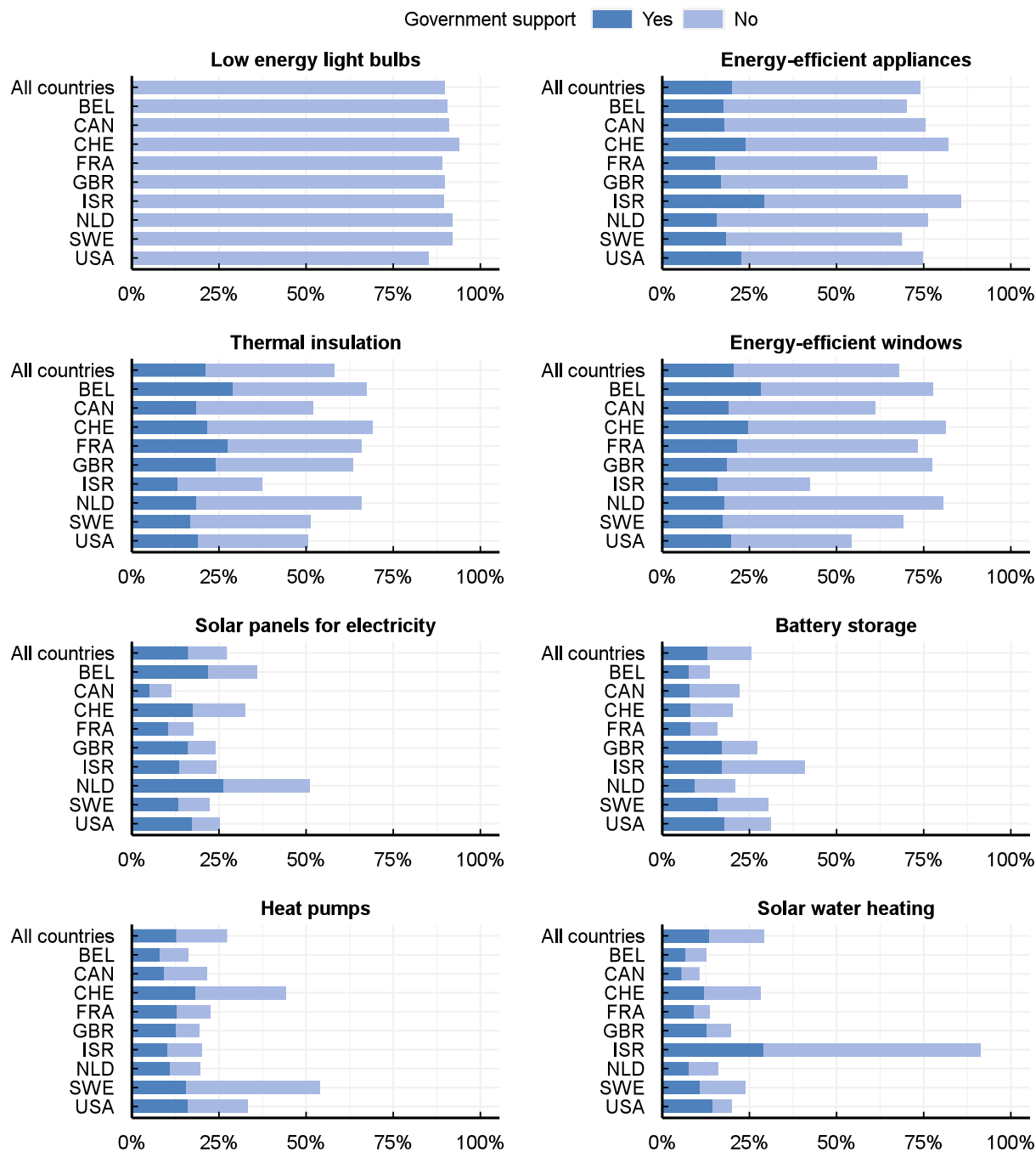
Government support ■ Yes ■ No

Note: These survey items asked respondents "Have you installed any of the following items over the past ten years in your current primary residence? " For each item that respondents had installed, the next question asked: "Has governmental financial support (e.g. grants, loans with below-market interest rates, tax exemption) encouraged you to install any of the following items in your residence?" The sample sizes for each item are the following: Battery storage: 3996, Energy-efficient appliances: 6826, Energy-efficient windows: 6317, Heat pumps: 4353, Low energy light bulbs: 7858, Solar panels for electricity: 4792, Solar water heating: 4535, Thermal insulation: 5326.
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink 🔗 https://stat.link/ligyo1

While the general use of low-emissions heating or cooling options (i.e. using heat pumps, solar heating, or electricity generated from renewables for heating and cooling needs) varies across countries, use within countries exhibits several patterns. First, in most countries, households that report using these options tend to be of high or middle income (Figure 2.9). On average, 15% of high-income households use low-emissions heating and cooling, versus 10% of low-income households. In France and the United States, households in the high-income quintiles are twice as likely to report using these options as those in the low-income quintiles. Low-income households are less likely than high-income households to install costly low-emissions technologies such as heat pumps. This could in part be attributed to financial resources available.[8] However, it could also be due to the fact that low-income households may be more likely to be renting and may not have the ability or incentives to install such equipment in their residence.

Indeed, homeowners report using low-emissions heating or cooling more frequently than tenants (14% versus 9%), with the most striking differences observed in Belgium, Switzerland and the United States. Dwelling type also appears to be associated with the use of low-emissions options. In seven of the nine countries, those living in detached houses more frequently report using these options than those living in apartment buildings (17% of house dwellers versus 11% of apartment dwellers) (Figure 2.9).[9] Finally, in all countries, environmentally concerned respondents are also more likely to use these options. In the United States, the prevalence of environmentally concerned respondents that report using these technologies is more than two times that of those with low environmental concern. Homeowners are also more likely than tenants to report using self-supplied electricity or electricity from local micro- or mini-grids.

Figure 2.9. Use of low-emissions heating or cooling varies by income level, tenant status, dwelling type, and environmental concern

Percentage of respondents who use low-emissions heating or cooling
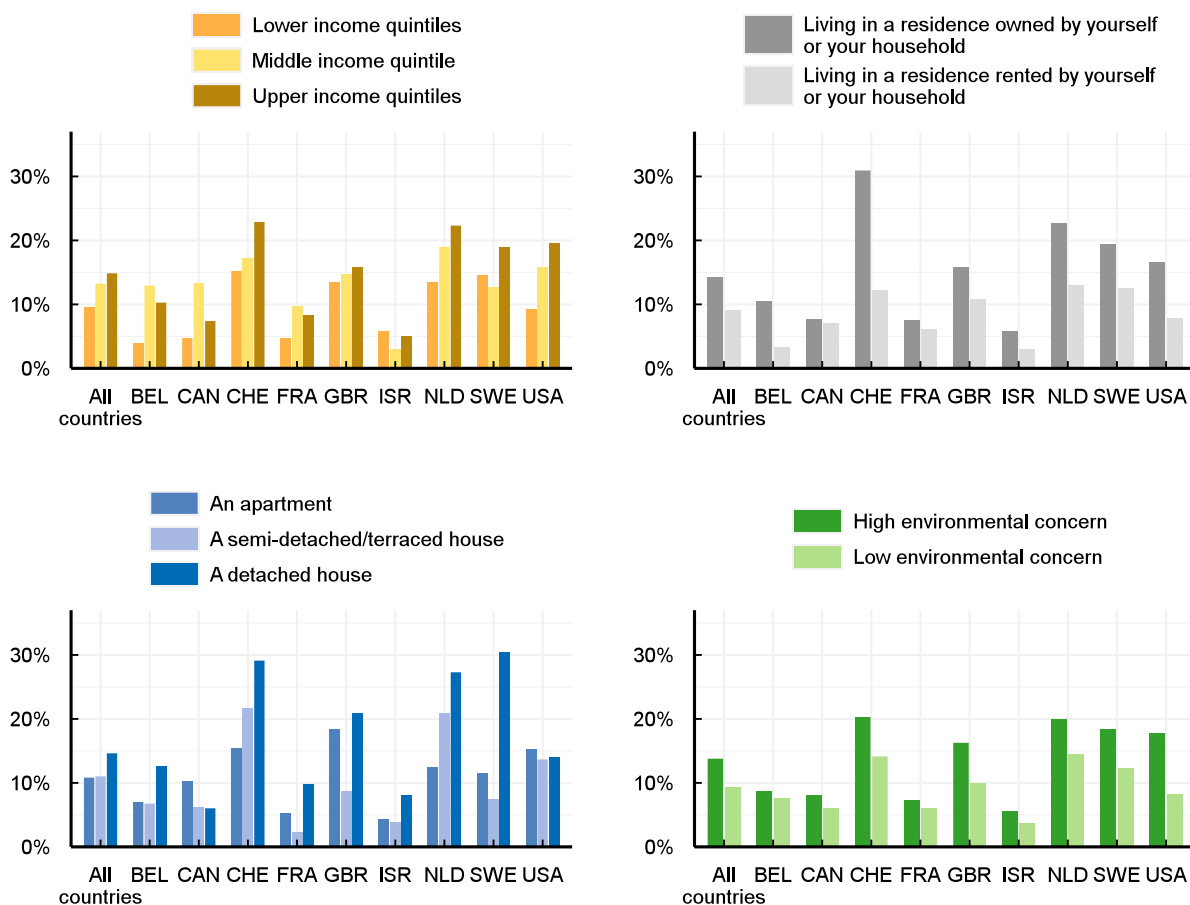
Note: This survey item asked respondents: "Which of the following energy sources do you use for space heating/cooling? Please select all that apply." Response options included electricity; gas; oil coal or other fossil fuels; wood or burning pellets; district heating or cooling; heat pumps; solar space heating, other and "Don't know". Respondents were able to select multiple responses except when selecting "Don't know". Low-emissions heating or cooling includes solar space heating, heat pumps, or electricity generated from renewable sources. Lower income quintiles refer to income quintiles 1 and 2; middle income quintile refers to income quintile 3; and upper income quintiles refer to income quintiles 4 and 5.
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ᐧᐧᐧᐧ https://stat.link/uqis10

2.3.3. Barriers to household adoption of low-emissions energy technologies

Survey results point to several barriers in the uptake of low-emissions energy technologies. Figure 2.10 displays the percentage of non-adopting households reporting that installing low-emissions technologies is not possible. Across countries and equipment types, close to half of non-adopting households indicate that installation is not possible, revealing that supply constraints (e.g. impossibility of installations in apartment buildings or the need for landlord permission) remain a significant barrier to the uptake of energy-saving equipment.[10] Other factors, such as affordability or lack of interest, are also reported by households as reasons for not adopting these technologies (Figure 2.11). Unsurprisingly, equipment that is expensive to purchase and install is also more likely to be associated with affordability-related constraints. For instance, while light bulbs are relatively easy to install and their purchase costs are relatively low, heat pumps are more costly and subject to more significant installation constraints. Government support for energy efficiency investments could therefore be proportional to the installation costs of technologies and could also better incentivise landlords in making such installations.

Figure 2.10. The feasibility of installing energy efficiency measures varies by technology and country

Percentage of non-adopting households reporting that installation is not possible
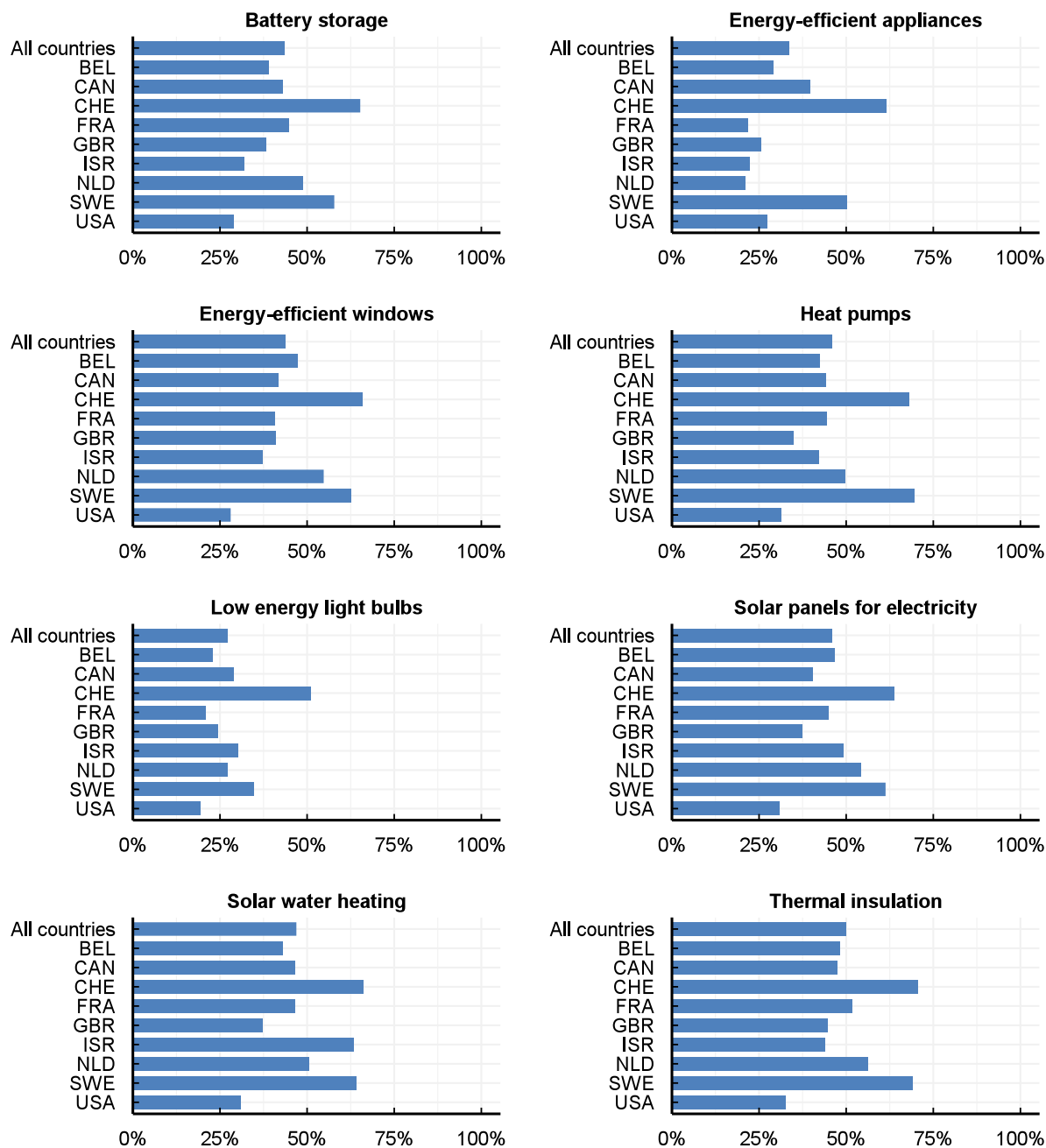
Note: These survey items asked respondents: "Have you installed any of the following items over the past ten years in your current primary residence?". Respondents who answered "No" were asked a follow-up question: "Why haven't you installed the following items?". For each type of equipment that they had not already installed over the past ten years, respondents selected the main reason why they had not done so. For each item, percentages are based on the sub-sample of respondents who did not install the item. Sample sizes are the following: Battery storage: 5064, Energy-efficient appliances: 2428, Energy-efficient windows: 3044, Heat pumps: 5476, Low energy light bulbs: 1009, Solar panels for electricity: 6121, Solar water heating: 5718, Thermal insulation: 3739.

Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink 🖳🖵 https://stat.link/36lvtn

Survey results indicate that feasibility not only varies by equipment type, but also by household characteristics. Compared to homeowners and those living in detached houses, tenants and those living in apartment buildings are more likely to cite the lack of feasibility as a reason for not installing low-emissions energy technologies. Lack of feasibility reflects the fact that installation is technically not possible in their residence or that the landlord, in the case of tenants, would need to install it (Figure 2.11).[11] Overall, 57% of apartment dwellers report that they have not installed battery storage, heat pumps or solar panels because installation is not possible, compared to 15% of those living in detached houses. Some respondents indicated that they are not interested in installing low-emissions technologies without specifying a reason (ranging from 12% for energy-efficient windows to 20% for low-energy light bulbs).

Figure 2.11. Barriers to installation of low-emissions technologies differ across residence types

Percentage of respondents stating different reasons for not having installed low-emissions energy technologies

Note: This survey item asked respondents: "Why haven't you installed the following items?". For each type of equipment that they had not already installed over the past ten years, respondents selected the main reason why they had not done so.
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ⧉ https://stat.link/4knja1

Figure 2.12 shows that low-income households report installing equipment less frequently than high-income households. Differences in uptake between low and high-income households are largest for thermal insulation (13%) and solar panels for electricity (9%). These reported levels of uptake suggest that, even where supply constraints have been eliminated, affordability appears to be a barrier to the uptake of equipment with high upfront installation costs.

Figure 2.12. Expensive low-emissions energy technologies are less likely to be installed by low-income households

Share of respondents who installed the item over the past ten years among households for whom installation is possible
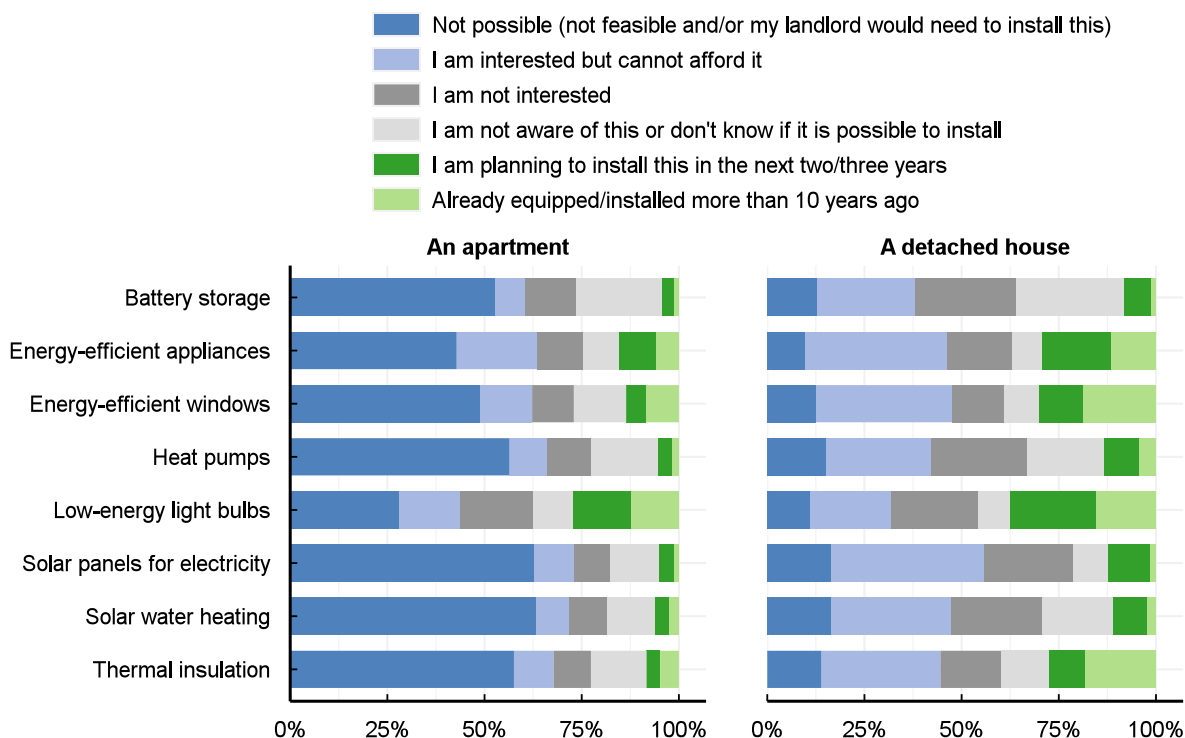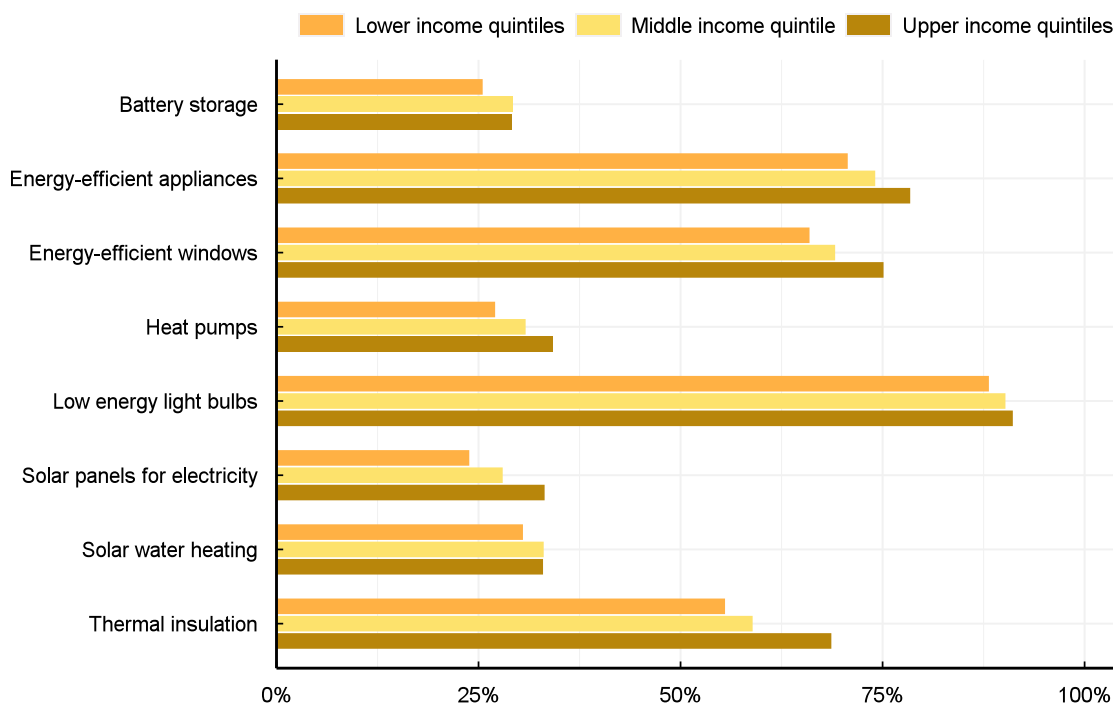

Note: This survey item asked respondents: "Have you installed any of the following items over the past ten years in your current primary residence?" Lower income quintiles refer to income quintiles 1 and 2; middle income quintile refers to income quintile 3; and upper income quintile refers to income quintiles 4 and 5. Respondents who indicated that installation was not feasible are excluded from the sample.
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ⫼ᵐˢᶜ▯ https://stat.link/5whu9q

Evidence suggests that consumers are willing to pay more for more energy-efficient appliances (Galarraga, González-Eguino and Markandya, 2011[16]). However, the results presented in Figure 2.13, Figure 2.12 and Figure 2.13 confirm that affordability nevertheless remains a barrier to the uptake of low-emissions energy technologies. In all countries and across all types of technologies, 21% of all respondents report that purchase and installation costs are prohibitive, regardless of their income. Among homeowners, affordability, rather than feasibility, is the main reported barrier to uptake, with 29% of households reporting that they have not installed low-emissions energy technologies because they cannot afford them. Affordability is more frequently cited by low-income households than high-income households as the main reason for not installing technologies such as energy-efficient appliances and heat pumps (Figure 2.13).

Further confirming the importance of affordability, respondents more frequently report that they plan to install lower-cost items such as efficient appliances (20%) and low-energy lightbulbs (26%) than higher-cost items such as heat pumps (9%). This finding could in part reflect differences in the awareness and availability of these options. Additionally, high-income households are more likely to report that they intend to install low-emissions technologies than low-income households (Figure 2.13). The finding is particularly striking for energy-efficient appliances, which 32% of high-income households plan to install in the near future, compared to 8% of low-income households (Figure 2.13). These findings suggest that improving the affordability of low-emissions technologies and the feasibility of their uptake among low-income households, tenants and those living in apartments should be a policy priority. Although support for high-income households should be lower than that for low-income households, even high-income households

indicate a need for reduced costs to install low-emissions energy technologies. Understanding and overcoming these reported barriers could boost adoption rates.

Figure 2.13. Reasons for not installing low-emissions energy technologies for low-income and high-income respondents

Percentage of respondents who did not install low-emissions energy technologies and for whom installation is feasible
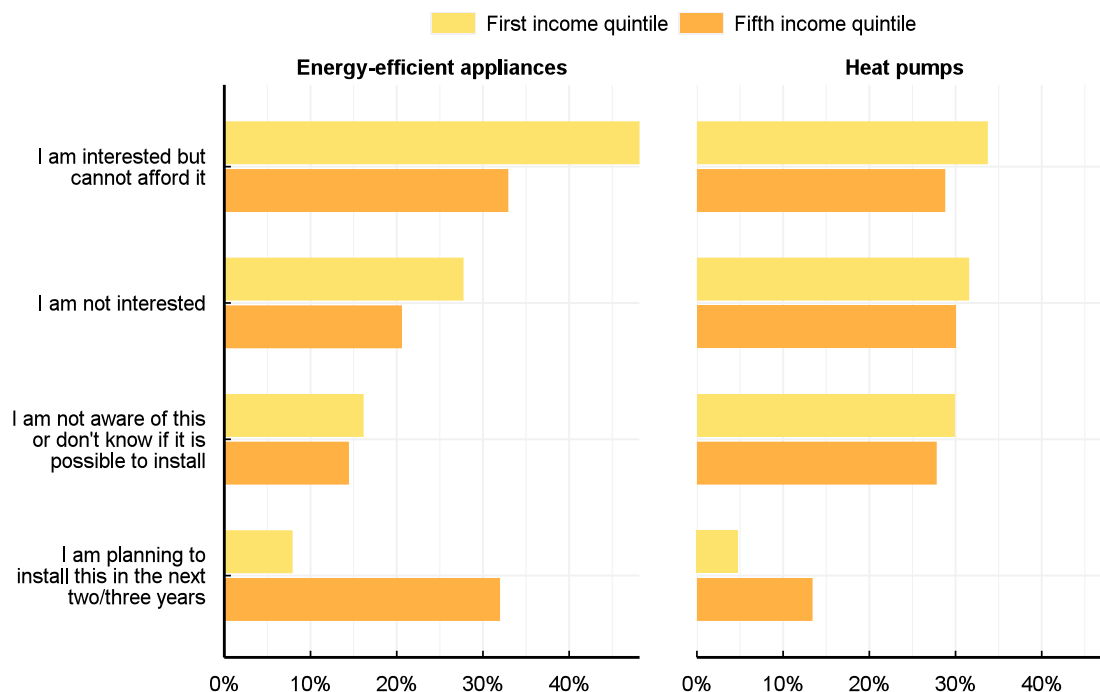
Note: This survey item asked respondents: "Why haven't you installed the following items?". For each type of equipment that they had not already installed over the past ten years, respondents selected the main reason why they had not done so.
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ⧉ https://stat.link/moyjck

When asked what would encourage them to reduce energy use further, respondents across the sample indicated their desire for more affordable and better-performing energy-efficient appliances (Figure 2.19, Section 2.5). A lack of knowledge about the equipment and its availability is the most common reason given for not installing battery storage (25% of households). Many respondents (29%) also report a lack of knowledge about heat pumps (Figure 2.13). Both high- and low-income households share a similar lack of awareness of low-emissions technologies generally (15% and 17% respectively).

2.4. Energy conservation behaviours

Energy savings can be accomplished by either improving the efficiency with which energy is used (e.g. by purchasing more energy-efficient appliances), or by reducing overall energy use (e.g. by turning off the lights when leaving a room). Overall, 92% of respondents state that they often or always turn out the lights when leaving a room, and 65% of respondents sampled either often or always air-dry their laundry (Figure 2.14). Significantly fewer respondents report air drying their laundry in Canada and the United States (44% and 35%, respectively). Overall, respondents state that they generally try to minimise their use of heating and cooling (68%) and of hot water (63%). Sweden and Israel reported the lowest levels of engagement in these two practices, with highest engagement reported in Belgium, France and the United Kingdom. Some of the observed variation across countries is likely to reflect dwelling type, climatic conditions and energy prices.

Figure 2.14. Turning off lights is the most common energy conservation behaviour

Percent of respondents indicating frequency of engagement

Note: This survey item asked respondents: "How often do you do the following in your daily life?" Response options were never, occasionally, often, always or not applicable. The figure shows relative frequencies of response options excluding not applicable.
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink 🖾 https://stat.link/bim5j7

Although the majority of respondents report that they are able to satisfy their energy needs, 46% indicate that they minimise energy use for financial reasons (Figure 2.15). Slightly fewer, 30% overall, report doing so for environmental reasons. Switzerland is an outlier in this regard, with 45% of respondents reportedly minimising energy use for environmental reasons. Across countries, 25% of respondents – ranging from 17% in the United Kingdom to 39% in Israel – indicate that they use as much energy as they want without regard for financial or environmental considerations. Across countries, the percentage of respondents indicating that they cannot use as much energy as they need due to the high cost ranges from 6% (in Switzerland) to 18% (in the United Kingdom). Since respondents were able to select multiple statements to characterise their household energy use, Figure 2.15 shows the relative frequency with which each response was selected out of the total number of responses selected in each country.

Figure 2.15. Most respondents minimise energy use for financial rather than environmental reasons

Relative proportion of each response option
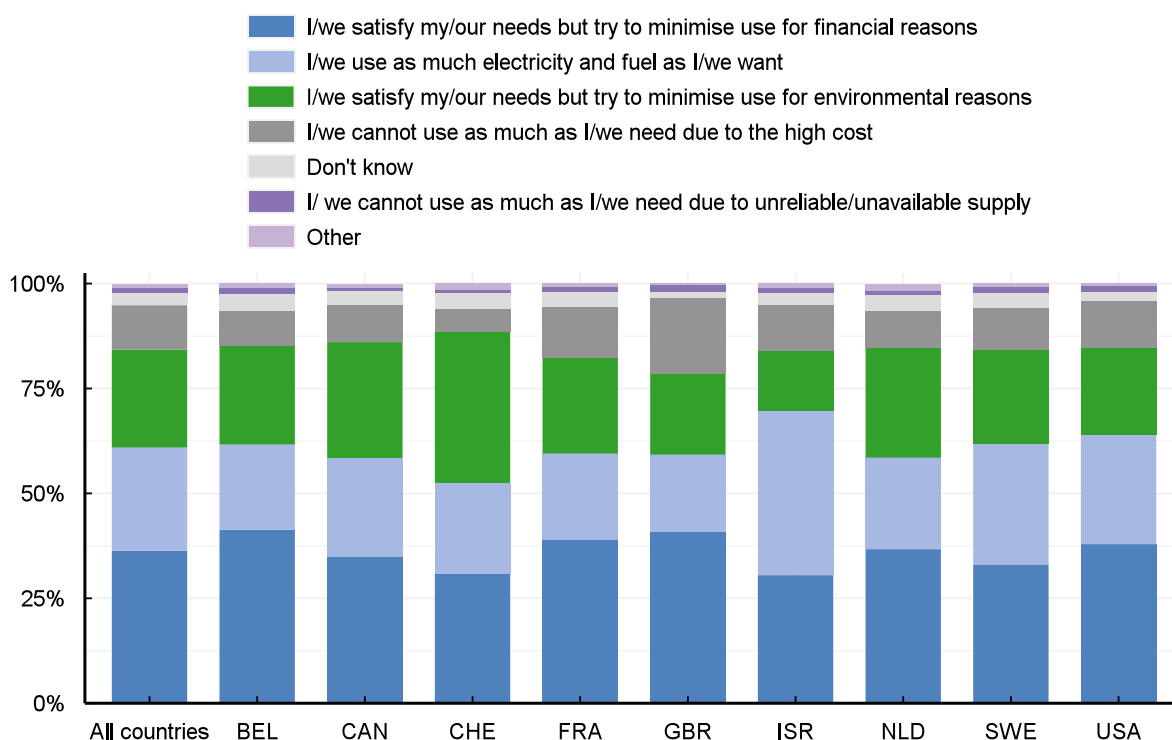
Note: This survey item asked respondents: "Thinking about your energy use at home, what statements best describe your household? Please select all that apply." The figure shows the relative frequency of response options for each country. "Needed consumption" refers to self-perceived levels of energy use that the respondent believes are necessary to achieve a minimum level of well-being.
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink 🔗 https://stat.link/gsfnzh

The degree to which respondents act to reduce energy use varies according to socio-economic characteristics. Low-income households appear to be more likely to reduce energy use (e.g. minimising the use of heating and cooling and air drying laundry) to save money. Women report engaging in all energy conservation behaviours slightly more than men. Respondents who report a high level of concern for environmental issues and climate change are more likely to report saving energy, especially minimising the use of heating and cooling, as well as hot water. There were no consistent differences in energy conservation across residential area (urban vs. rural) or dwelling type (apartment vs. house).

When asked why they do not always engage in energy conservation behaviours, 36% of respondents cited either forgetfulness or a lack of practical knowledge on how to do so (Figure 2.16). Other reasons cited include the difficulty of changing one's habits (11%) and the perception that there is no personal benefit to changing one's behaviour (6%). Combined, these account for around half of all the reasons cited (the bars outlined in black in Figure 2.16). Importantly, these reasons can be fairly easily addressed through low-cost demand-side measures that have documented impacts on energy conservation, such as sustainable default options (e.g. temperature settings), providing feedback on energy use, and enabling comparisons with other households (IEA, 2021[17]). Since respondents were able to select multiple reasons why they do not engage more frequently in energy conservation behaviours, Figure 2.16 shows the frequency with which each reason was cited of out of the total number cited in each country.

The other reasons included in Figure 2.16 (e.g. "I feel like my other environmental actions already make enough of a difference") reflect attitudinal factors that may be more difficult to address through public policies. Where attitudinal factors reflect a lack of information (e.g. on the impacts of certain behaviours), these reasons for inaction could be targeted by education efforts. However, research indicating that attitudes are relatively stable over time, and that information is only accepted if it is considered credible, suggests that the role of information provision could be limited in some contexts (Wood and Vedlitz, 2007[18]; Druckman and McGrath, 2019[19]). Rather than relying on attitudinal change or persuasion, therefore, communications could focus on aligning messages with the types of information that people find credible, such as the cost savings from energy conservation (Druckman and McGrath, 2019[19]). Information therefore needs to be carefully designed and targeted, paying attention to its alignment with underlying preferences and the credibility of the messaging.

Figure 2.16. Habit and lack of knowledge are holding back energy conservation actions

Proportion of the total number of times each reason was cited
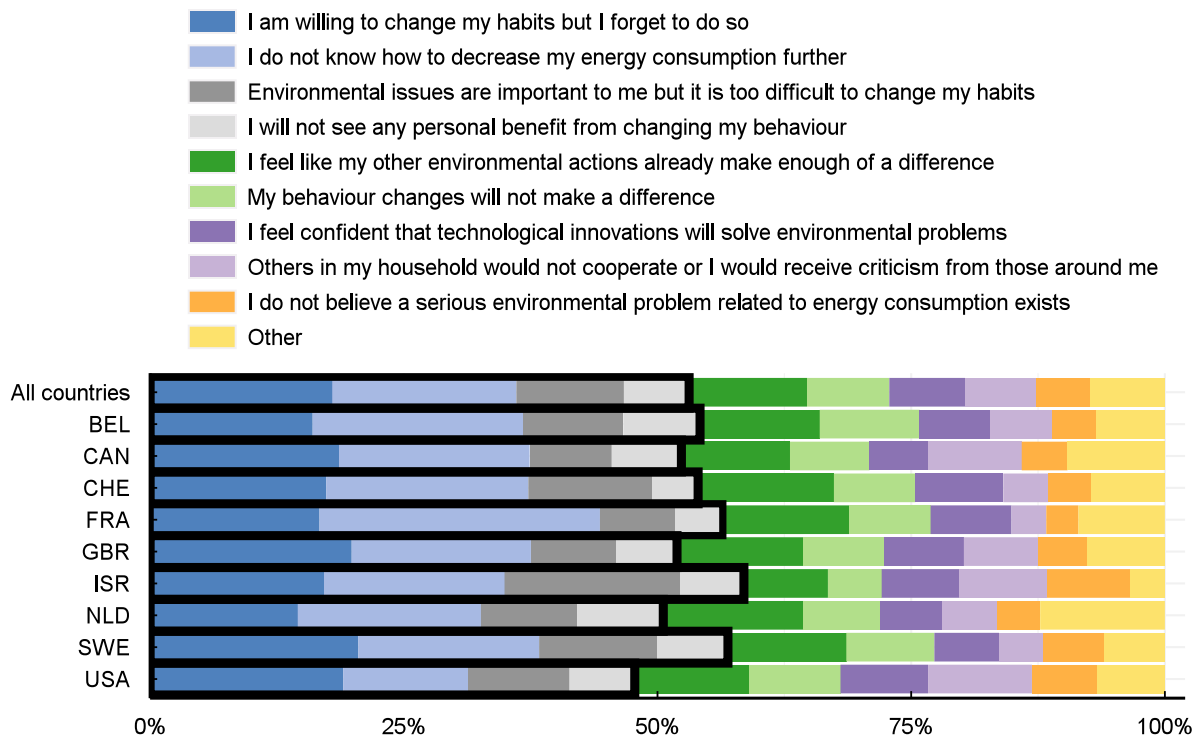
Note: The segments of the bars outlined in black reflect the proportion of reasons cited that could be relatively easily targeted by public policies. This survey item asked respondents: "Your answers on the previous question indicate that you do not always try to reduce energy consumption in your household. Please help us understand the most important reasons why not: Please select all that apply." The figure shows relative frequency of the response options for each country. This item was asked of those respondents who indicated that they did not always engage in at least one of the five energy conservation behaviours. The sample sizes in each country are the following: BEL: 805, CAN: 840, CHE: 840, FRA: 785, GBR: 785, ISR: 800, NLD: 815, SWE: 852, USA: 1540.
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink 🖳📊 https://stat.link/jdquzx

2.5. Support for energy policies

Respondents across countries indicate high support for energy-related policies. These policies include energy efficiency standards, subsidies for housing renovation, purchasing energy-efficient appliances or investing in renewable energy equipment, and taxing the use of energy or the purchase of highly energy-consuming appliances. Overall, 72% support or strongly support subsidies for housing renovations or energy-efficiency equipment, while 71% support energy efficiency standards. There is markedly less support for measures involving taxes or charges (38% overall), with the highest level of support reported by respondents in Switzerland (49%).[12] Those who are environmentally concerned are more supportive of energy-related policies (Figure 2.17). There is less support for energy taxes, especially among those less concerned about the environment and those who have no confidence in the national government. But even those who are environmentally concerned are less likely to support these types of policy than energy efficiency standards or renewable energy subsidies.

A number of additional factors determine support for public policies, including the equity, objectives and use of revenues generated by the policy in question (Dechezleprêtre et al., 2022[20]). Taken together, the survey results can provide guidance for targeted awareness campaigns to increase public support for energy-related environmental policies. Groups of respondents that express strongest disagreement with public policies could be of special relevance for communication efforts given that these groups are also likely to be the most publicly vocal regarding their opposition.

Figure 2.17. Environmental concern and confidence in the national government drive support for energy policies

Percentage of respondents supporting or strongly supporting the policy measure
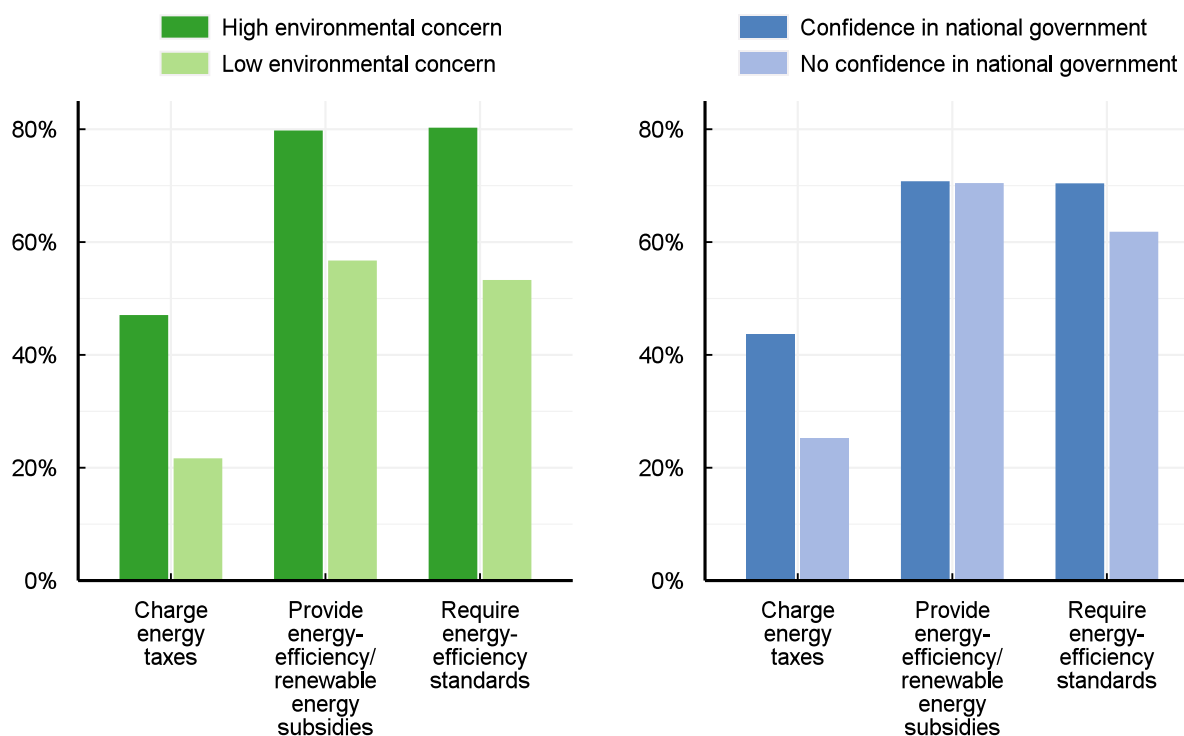
Note: This survey item asked respondents: "To what extent do you support the following potential policy measures?" For each policy, respondents could select strongly against, against, indifferent, support or strongly support.
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ⛓️📊 https://stat.link/1u50sj

Overall, 70% of respondents – both high and low-income – agree that low-income households should receive government support to help them pay for energy-efficient equipment. Respondents with high environmental concern express greater support for subsidies to low-income households than those who are less environmentally concerned (Figure 2.18). Meanwhile, low-income households express more support than high income households, especially those that are more environmentally concerned. Targeted subsidies are supported by 83% of households that are characterised by low income and high environmental concern. However, more than two-thirds of high-income respondents in Canada, the Netherlands, France, Israel and the United Kingdom also express support for these subsidies, reflecting the cited importance of affordability within this group, as well.

Figure 2.18. Environmentally concerned respondents are most in favour of government support to low-income households for low-emissions energy technologies

Percentage of respondents agreeing that low-income households should receive government support (e.g. subsidies)
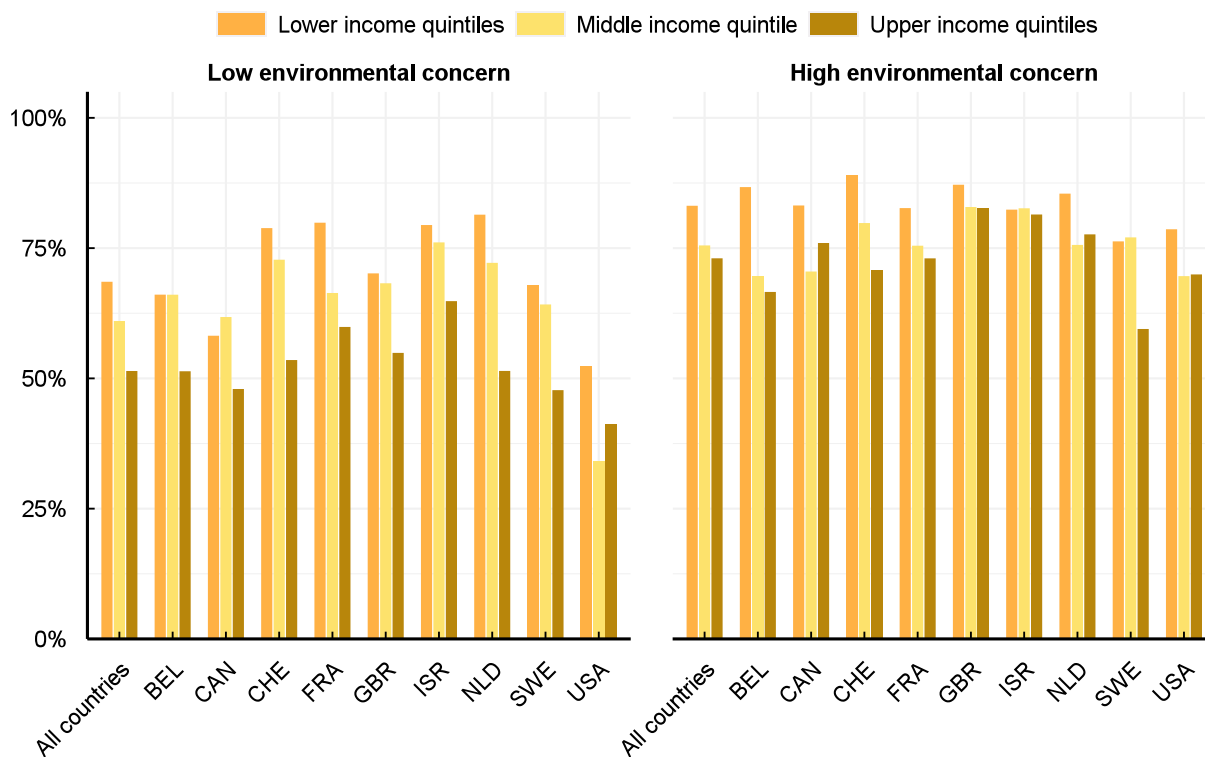
Note: This survey item asked respondents: "Do you think that low-income households should receive government support (e.g. subsidies) to help them pay for energy-efficient equipment?" Respondents could select yes, no or don't know.
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ᠍᠍ᡒᡅᠣᡗ https://stat.link/lzvtxi

Respondents were also asked which factors would be very important in encouraging them to reduce their own energy use. They were notably asked about: better-performing energy-efficient appliances, higher energy prices, more practical information on reducing energy consumption, and lower costs for energy-efficient devices and renovation. Approximately 20% of respondents indicated that all of these energy-related policies would be very important. Reduced costs for energy-efficient devices and for renovation was on average cited the most often (36%), followed by better performance of energy-efficient appliances (31%) (Figure 2.19). There was considerable variation in the extent to which respondents cited higher energy prices, ranging from 15% in Switzerland to 42% in the United Kingdom. Fewer respondents rated more practical information on how to reduce energy use as very important. Of all the countries surveyed, respondents from Sweden expressed the least support of all measures apart from higher energy prices.

Figure 2.19. Reducing the cost of energy-efficient devices and renovation would be important in encouraging respondents to reduce their energy consumption

Percentage of respondents citing each reason as very important

Note: This survey item asked respondents: "How important would the following factors be in encouraging you to reduce your energy consumption?" For each factor, respondents selected not at all important, not important, indifferent, important, very important or don't know.
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ⬛ https://stat.link/ngi96f

Low-income households more frequently report costs as important than high-income households. However, this is not the case in the United Kingdom, Canada and the United States, where high-income households cite cost as an important factor more frequently than low-income households. Differences in the cost of energy-efficient appliances (IEA, 2020[21]) and the provision of government support for low-income households could play a role in explaining the distribution of respondents citing cost as an important factor.

A qualitative comparison with a similar question asked in the 2011 EPIC survey suggests that reduced costs for low-emissions energy technologies are more important to respondents in 2022 than they were in 2011 in the relevant countries. The relatively higher importance of costs in 2022 could be reflective of a fall in the importance of other factors, such as awareness or availability, over this time period.

References

ACEEE (2013), *The Greatest Energy Story You Haven't Heard: How Investing in Energy Efficiency Changed the US Power Sector and Gave Us a Tool to Tackle Climate Change*, https://www.aceee.org/sites/default/files/publications/researchreports/u1604.pdf (accessed on 26 April 2023). [8]

Ameli, N. and N. Brandt (2015), "What impedes household investment in energy efficiency and renewable energy?"*, OECD Economics Department Working Papers*, No. 1222, OECD Publishing, Paris, https://doi.org/10.1787/5js1j15g2f8n-en. [15]

Aydin, E., D. Brounen and N. Kok (2018), "Information provision and energy consumption: Evidence from a field experiment", *Energy Economics*, Vol. 71, pp. 403-410, https://doi.org/10.1016/j.eneco.2018.03.008. [13]

CER (2022), *Canada's Renewable Power: Ontario*, https://www.cer-rec.gc.ca/en/data-analysis/energy-commodities/electricity/report/canadas-renewable-power/provinces/renewable-power-canada-ontario.html (accessed on 26 April 2023). [11]

Creutzig, F. et al. (2022), "Demand-side solutions to climate change mitigation consistent with high levels of well-being", *Yamina Saheb*, Vol. 20, https://doi.org/10.1038/s41558-021-01219-y. [6]

Damigos, D. et al. (2021), "Does energy poverty affect energy efficiency investment decisions? First evidence from a stated choice experiment", *Energies 2021, Vol. 14, Page 1698*, Vol. 14/6, p. 1698, https://doi.org/10.3390/EN14061698. [23]

Dechezleprêtre, A. et al. (2022), "Fighting climate change: International attitudes toward climate policies"*, OECD Economics Department Working Papers*, No. 1714, OECD Publishing, Paris, https://doi.org/10.1787/3406f29a-en. [20]

Druckman, J. and M. McGrath (2019), "The evidence for motivated reasoning in climate change preference formation", *Nature Climate Change 2019 9:2*, Vol. 9/2, pp. 111-119, https://doi.org/10.1038/s41558-018-0360-1. [19]

Durišić, V. et al. (2020), "Determinants of household electrical energy consumption: Evidences and suggestions with application to Montenegro", *Energy Reports*, Vol. 6, pp. 209-217, https://doi.org/10.1016/J.EGYR.2019.10.039. [9]

Galarraga, I., M. González-Eguino and A. Markandya (2011), "Willingness to pay and price elasticities of demand for energy-efficient appliances: Combining the hedonic approach and demand systems", *Energy Economics*, Vol. 33/SUPPL. 1, pp. S66-S74, https://doi.org/10.1016/J.ENECO.2011.07.028. [16]

Gillingham, K. and K. Palmer (2014), "Bridging the energy efficiency gap: Policy insights from economic theory and empirical evidence", *Review of Environmental Economics and Policy*, Vol. 8/1, pp. 18-38, https://doi.org/10.1093/reep/ret021. [24]

Gomm, S. et al. (2022), *Swiss Environmental Panel Seventh Survey Wave: Baseline Survey*, ETH Zurich ISTP, https://doi.org/10.3929/ethz-b-000572916. [27]

Guo, J., C. Li and C. Wei (2021), "Decoupling economic and energy growth: aspiration or reality?", *Environ. Res. Lett*, Vol. 16, p. 44017, https://doi.org/10.1088/1748-9326/abe432. [5]

IEA (2022), *Energy Efficiency*, https://www.iea.org/reports/energy-efficiency (accessed on 10 February 2023). [14]

IEA (2022), *Global electricity generation by technology, 2015, 2021 and 2027*, World Energy Outlook, https://www.iea.org/data-and-statistics/charts/global-electricity-generation-by-technology-2015-2021-and-2027 (accessed on 23 February 2023). [2]

IEA (2022), *World Energy Balances (dataset)*, https://www.iea.org/data-and-statistics/data-product/world-energy-balances (accessed on 7 September 2022). [1]

IEA (2021), *The Potential of Behavioural Interventions for Optimising Energy Use at Home*, International Energy Agency, Paris, https://www.iea.org/articles/the-potential-of-behavioural-interventions-for-optimising-energy-use-at-home# (accessed on 23 February 2023). [17]

IEA (2021), *World Energy Balances*, International Energy Agency, Paris, https://doi.org/10.1787/45be1845-en. [3]

IEA (2020), *Energy Efficiency 2020*, International Energy Agency, Paris, https://www.iea.org/reports/energy-efficiency-2020/appliances (accessed on 21 June 2022). [21]

IPCC (2022), *Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, https://doi.org/10.1017/9781009157926. [7]

Leard, B., J. Linn and K. Springel (2019), "Pass-through and welfare effects of regulations that affect product attributes", *Resources for the Future Working Paper 19-07*, https://www.rff.org/publications/working-papers/pass-through-and-welfare-effects/ (accessed on 6 February 2023). [25]

Liddle, B. and H. Huntington (2020), "Revisiting the income elasticity of energy consumption: A heterogeneous, common factor, dynamic OECD and non-OECD country panel analysis", *The Energy Journal*, Vol. 41/3, https://doi.org/10.5547/01956574.41.3.blid. [26]

Liddle, B., R. Smyth and X. Zhang (2020), "Time-varying income and price elasticities for energy demand: Evidence from a middle-income panel", *Energy Economics*, Vol. 86, p. 104681, https://doi.org/10.1016/j.eneco.2020.104681. [22]

OECD (2021), *Environment at a Glance Indicators-Air quality Air quality*, OECD. [4]

OECD (2013), *Greening Household Behaviour: Overview from the 2011 Survey*, OECD Studies on Environmental Policy and Household Behaviour, OECD Publishing, Paris, https://doi.org/10.1787/9789264181373-en. [10]

Rivers, N. (2018), *Leveraging the smart grid: The effect of real-time information on consumer decisions*, OECD Publishing, Paris, https://doi.org/10.1787/6ad4d5e3-en. [12]

Wood, B. and A. Vedlitz (2007), "Issue Definition, Information Processing, and the Politics of Global Warming", *American Journal of Political Science*, Vol. 51/3, pp. 552-568, https://doi.org/10.1111/J.1540-5907.2007.00267.X. [18]

Notes

[1] Over the same period, global GDP per capita grew at an annual rate of 3.9%, suggesting that a 1% increase in income is associated with an increase in electricity demand of approximately 0.4%. However, these relative changes should not be interpreted as an equivalent measure to elasticity. Liddle, Smyth and Zhang (2020[22]) estimate income elasticities in 26 OECD countries, ranging from 0.6 to 0.8. Liddle and Huntington (2020[26]) find a GDP elasticity of energy demand of approximately 0.7 for 37 OECD and 41 non-OECD countries, with no evidence of significant variation across countries and across income levels within countries.

[2] See Annex B on the design and implementation of the EPIC survey and on the quality of the panel of respondents.

[3] Differences in samples as well as in the formulation of some questions prevents direct comparisons of the results across survey rounds.

[4] Monthly cost as elicited in the EPIC Survey does not include the amortised investment cost of low-emissions energy technologies (i.e. installation costs).

[5] While results from the three survey rounds are not strictly comparable due to differences in sample sizes, representativeness, and in how the questions are worded, large differences observed over time can indicate an overall trend.

[6] Battery storage helps to smooth fluctuations in energy supply from renewables, increasing their reliability as an energy source. It also enables households to store self-generated electricity. Respondents were asked about battery storage generally, i.e. not in connection with self-generated electricity.

[7] The survey gave households the option to indicate that installation of equipment was not possible by selecting "Not possible (not feasible in my house/apartment/area and/or my landlord would need to install it")".

[8] Some evidence suggests that resource constraints can exacerbate consumer myopia (a tendency to focus on certain types of decisions and/or on costs and benefits in the short term versus the long term) related to investment decisions (Damigos et al., 2021[23]; Leard, Linn and Springel, 2019[25]). This tendency could also affect investments in low-emissions energy technologies (Gillingham and Palmer, 2014[24]).

[9] This finding could reflect the fact that apartment residents have lower heating needs than residents in detached houses. It could also reflect correlations between dwelling type and variables such as income and tenant status (renter or owner). The former affects the financial resources available to make upfront investments in low-emissions energy technologies, while the latter has implications for the time horizon and size of potential benefits of such investments.

[10] To the extent that low-income households are also renters, the primary barrier to installation of low-emissions technologies will be feasibility, rather than cost.

[11] The survey gave households the option to indicate that installation of equipment was not possible by selecting "Not possible (not feasible in my house/apartment/area and/or my landlord would need to install it")".

[12] Though lower, this is comparable to results from Wave 7 of the Swiss Environmental Panel (Gomm et al., 2022[27]), held in May–August 2021, which found that 60% of respondents agreed or strongly agreed with the statement "A CO_2 tax is a suitable means of reducing Switzerland's greenhouse gas emissions."

3 Household behaviour and transport

Our transport activity is currently responsible for about a quarter of global greenhouse gas emissions, and has a wide range of other environmental, health and social costs. This chapter analyses households' transport choices, based on their responses to the 2022 OECD Survey on Environmental Policies and Individual Behaviour Change (EPIC). It explores patterns in households' use of public transport, individual modes of transport, and air travel. It also assesses the factors that will enable households to make more sustainable mobility choices, providing implications for policymakers.

Key findings

- **Shifting households away from conventional car use is challenging, in rural and urban areas alike.** While reliance on cars is higher in rural areas, car use is still significant even in urban areas where it accounts for 50% of commuter travel. The proportion of urban commuters that use a private car is greatest in the United States (65%), Canada (56%) and Israel (56%). Across the nine countries surveyed, 75% of households report that at least one household member uses a conventional car on a regular basis. Conventional car use does not vary significantly by level of environmental concern, indicating the extent of households' dependence on private cars, as well as the constraints and inconveniences associated with changing this behaviour.

- **Making it easier and cheaper for households to use public transport can help to reduce car dependency and the environmental impacts of transport activity, particularly in urban areas.** Overall, 54% of regular car users indicate that improved public transport would encourage them to drive less. In particular, they would like to see more frequent services, better network coverage and lower fares. For those households that do not use a car, public transport availability is an important reason.

- **A widespread transition to electric cars will be key for decarbonising the transport sector, but more charging infrastructure is needed to encourage uptake.** More than 80% of potential car buyers plan to buy a car that runs at least partially on fossil fuels. Overall, 33% of households report that there are no charging stations for electric cars within three kilometres of their home, ranging from 22% in the Netherlands to 43% in France. Communicating existing infrastructure coverage as well as planned developments, and their time frame, could boost public awareness and help households consider future electric vehicle purchases.

- **Taxes and other charges to discourage car use could be more acceptable if complemented by investments in public transport.** Measures to improve public transport systems enjoy widespread support in all countries, ranging from 72% in the United States to 84% in Israel. Households also indicate general support for subsidies for low-emission or efficient cars, setting stricter fuel efficiency standards for new cars and providing more detailed environmental labels. In contrast, roughly one-third of households overall express strong disagreement with deterrent measures, such as a fee per kilometre driven (32%), increased parking fees (31%) and a tax on carbon emissions (18%). It seems possible that opposition to taxes and other charges could therefore be mitigated by investing the revenues generated in improving public transport systems, as well as in walking and cycling infrastructure. Alternative measures (e.g. increasing the affordability of electric cars and the capacity for at-home charging) will be required in rural contexts that are not suitable for the development of public transport services.

3.1. Introduction

Transport is indispensable for accessibility and the exchange of goods, but generates a wide range of environmental, health and social costs. The transport sector is responsible for about one-fourth of global greenhouse gas (GHG) emissions. The amount of carbon dioxide (CO_2) emitted by the sector is particularly difficult to reduce, as private car ownership rates are increasing and internal combustion engine cars may continue to be used for some time (ITF, 2021[1]). Apart from emissions, transport activities generate negative externalities in the form of local air pollution, noise, accidents and congestion. The societal costs of air pollution increase in areas with high congestion, which also tend to be densely populated. Passenger and freight transport activities gave rise to more than 50% of global nitrogen oxide emissions (NO_X), 30% of carbon monoxide (CO), 20% of volatile organic compounds (VOCs) and 15% of sulphur dioxide (SO_2) in 2015 (IEA, 2016[2]). The annual per capita welfare cost of air pollution in OECD countries was estimated at USD 1 280 in 2015, a number projected to increase to USD 1 650 in 2060[1] (OECD, 2016[3]). Congestion is also responsible for losses in time and fuel that translate into significant costs (Goodwin, 2004[4]).

Analysis by the Intergovernmental Panel on Climate Change (IPCC) indicates that demand-side strategies can reduce up to 67% of GHG emissions in the land transport sector (IPCC, 2022[5]). Urban planning can reduce vehicle kilometres travelled by, for example, reallocating road and parking space to public transit or bike lanes, thereby saving fuel and reducing emissions (ITF, 2021[6]). Technology adoption also plays an important role. Banning conventional internal combustion engine cars and instituting electric car targets could reduce the transport sector's GHG emissions by 30-70% (IPCC, 2022[5]). At the individual level, living car-free and avoiding long-haul flights will have the largest impact on emissions reductions. Shifts to public transport or battery electric vehicles also provide substantial mitigation potential (IPCC, 2022[5]). In cities, reduced conventional car use and more active mobility will also improve outdoor air quality (Creutzig et al., 2022[7]).

Effective transport decarbonisation policies are needed for a more sustainable future for the sector. In particular, they should promote reductions in unnecessary travel, shifting to less polluting transport modes, improving energy efficiency and scaling up the use of electric cars and low-carbon fuels (ITF, 2021[1]).[2] These changes will help to minimise overall transport demand, reduce the use of motorised vehicles and reduce the emissions intensity of the average passenger kilometre travelled.

Shifts in behaviour can occur at different time scales (Weis et al., 2010[8]). Some changes can be made immediately and at a relatively low monetary cost, such as switching to a different mode of transport for a given trip, say biking rather than using a car. However, the personal costs of such changes (e.g. inconvenience) can be high (Gardner and Rebar, 2019[9]). Changes can also occur over the medium term, such as the decision to purchase a car powered by fossil fuels or alternative fuels. Long-run changes in behaviour, such as concerning where to live and how far to commute, tend to have considerable financial significance for individuals, as well as an impact on the environmental footprint of transport activity (OECD, 2018[10]; OECD, 2021[11]).

Behavioural change is critical to these shifts in the transport sector. The success of policies designed to reduce the environmental impact of transport activities relies on understanding the choices that determine households' travel patterns and modes of transport. Car-dependency presents a particular challenge and will require large-scale transformative policies to shift households to sustainable travel modes and reduce travel demand (OECD, 2022[12]). Policy objectives should notably include:

- Massively increasing the availability and accessibility of public transport and soft mobility will require policymakers to understand respondents' preferences for attributes such as accessibility and convenience (ITF, 2021[1]; ITF, 2017[13]). This will aid policymakers in providing sufficient quality of service and designing relevant cost-effective incentive mechanisms for public transit systems.

- Mainstreaming alternative fuel vehicles – such as battery electric, plug-in hybrid electric and hydrogen fuel cell vehicles – will depend on how potential adopters respond to the relative attributes of these options (e.g. purchase price and running costs) compared with conventional cars. There is therefore a need to better understand consumer preferences and socio-economic conditions, and their role in the demand for alternative fuel vehicles. In the long term, supply-side regulations, such as a ban on the sale of new conventional cars, will condition consumer choice in important ways (EPRS, 2022[14]).

This chapter provides an overview of the data gathered in the third round of the OECD Survey on Environmental Policies and Individual Behaviour Change (EPIC) on household mobility patterns.[3] It explores in particular households':

- use of public transport and long-distance travel
- use of conventional and electric cars
- support for sustainable transport policies.

For each of these areas, the chapter uses representative country samples to analyse differences in respondents' behaviours and attitudes across relevant variables such as income level, residence type and location, ownership status and level of environmental concern.

3.2. Household use of public transport and long-distance travel

3.2.1. Public transport

Although 50% of respondents living in urban areas across countries rely on public transport, walking and cycling when travelling to work, the remainder use conventional cars (45%), motorcycles (1%) or carpooling (4%). Significant differences in transport mode are observed across urban, suburban and rural areas (Figure 3.1).[4] Differences in mode use across residential areas appears most pronounced in France, where 71% of households in rural areas report using a car as their primary mode of commuting, compared to 49% and 37% in suburban and urban areas, respectively. Reported car use is highest in the United States, where 82% of households report using a car to commute in rural areas and 65% report using one in urban areas. Car use for commuting in suburban areas varies from 31% in Switzerland to 79% in the United States. Bicycle use is highest for urban, suburban and rural areas in the Netherlands (39%, 27% and 32%, respectively). The greatest proportion of respondents that report walking as a primary commuting mode was in the United Kingdom, where 25% of respondents in urban areas and 23% in rural areas report doing so.

Figure 3.1. Household use of conventional cars is high

Percentage of respondents using each mode as their primary mode of commuting
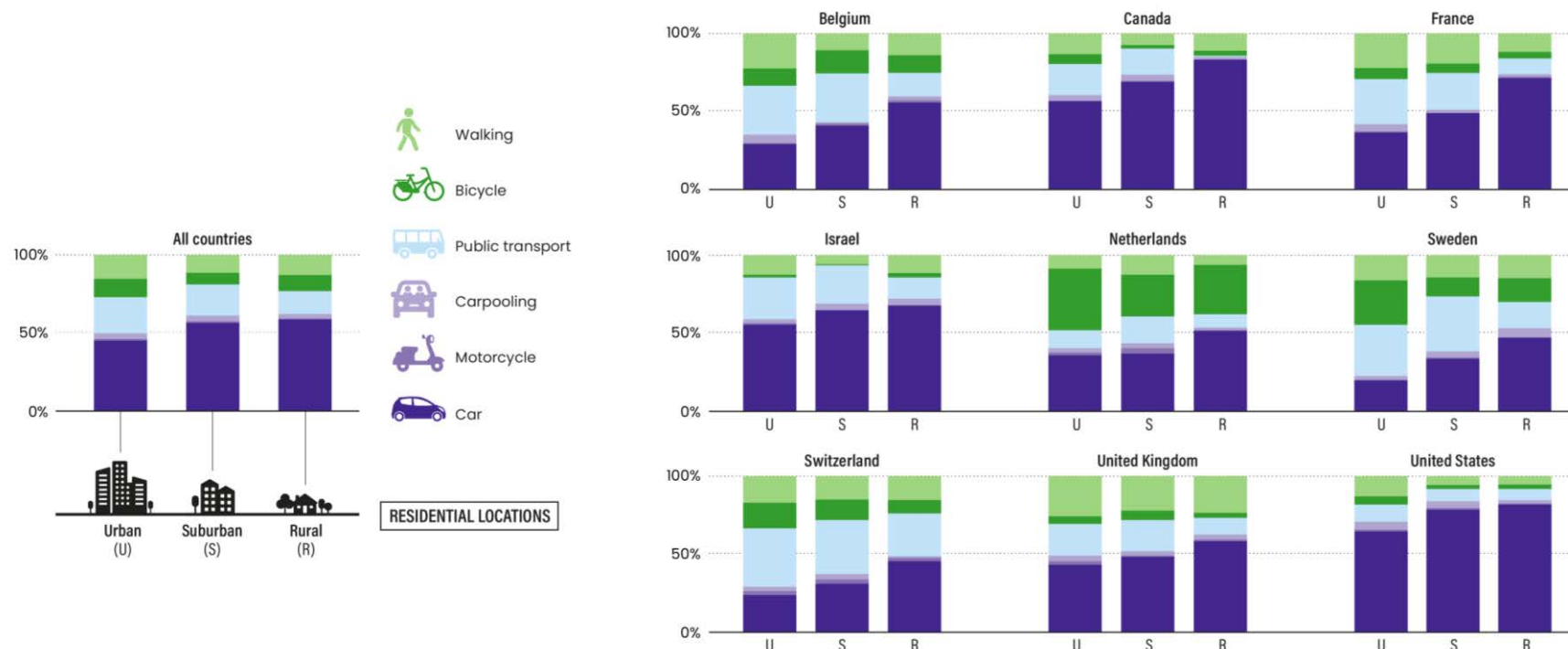
Note: This survey item asked respondents: "Thinking of your personal travel, how do you usually travel to each of the following activities? Please select your primary mode of transport". When respondents answered "not applicable" they were excluded. Sample sizes are the following: BEL: 603, CAN: 543, CHE: 732, FRA: 642, GBR: 555, ISR: 821, NLD: 647, SWE: 693, USA: 1044.
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ⬛ https://stat.link/frmu6t

The use of public transport varies widely by country – from 71% of households in Switzerland to 28% in the United States (Figure 3.2). Despite this cross-country variation, several patterns in public transport use can be observed across the nine countries surveyed. In most countries, lower-income households more frequently report regular use of public transport than wealthier households. In Switzerland and the United States, however, higher-income households appear to use public transport more than lower-income households.[5] With the exception of Israel, reported use of public transport is 10% higher among those with high levels of environmental concern than those with low environmental concern.

Figure 3.2. Public transport is one of the most widely used forms of non-car transport

Percentage of households regularly using different modes of transport
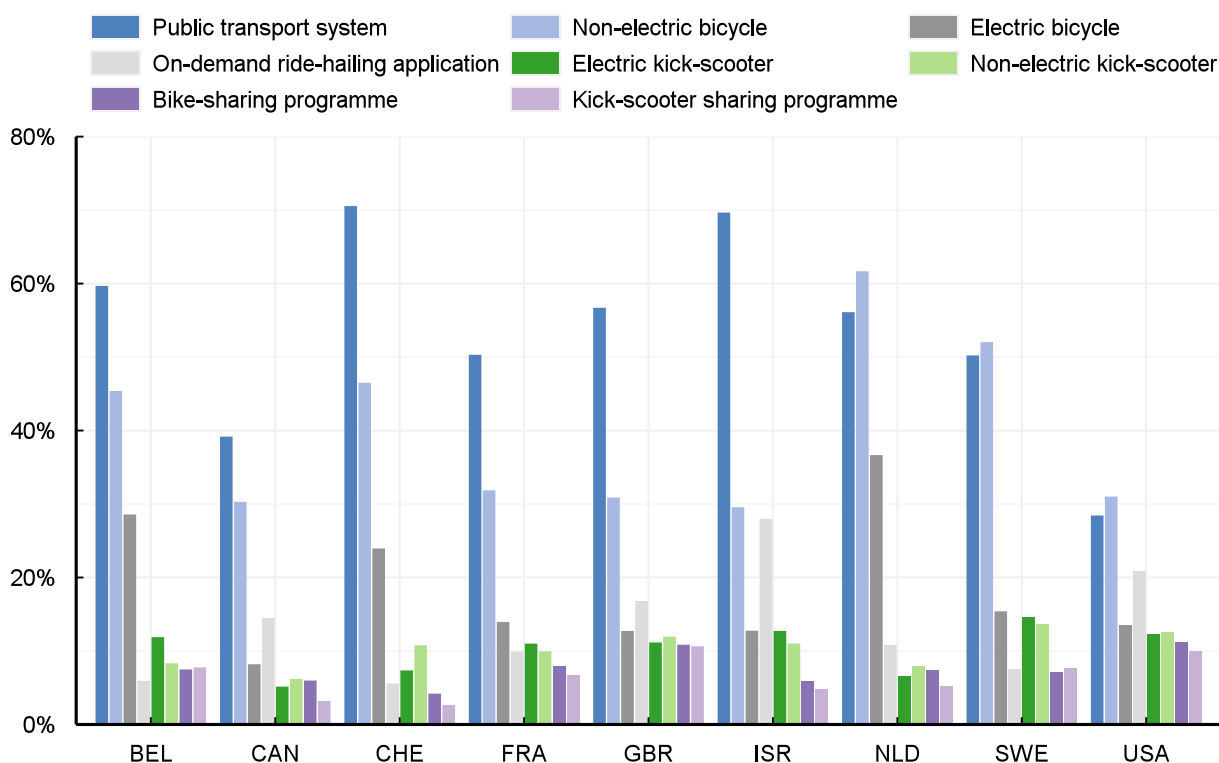
Note: This survey item asked respondents: "Does your household regularly use any of the following (including company-provided) equipment?" For each type of equipment, respondents selected "Yes, I do", "Yes, someone else in the household does", "Neither of these" or "Don't know". The last two response options are exclusive. The figure shows the percentage of respondents indicating that they or someone else in the household use the mode of transport.
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ⟰ https://stat.link/1qjukb

The survey data further indicate that households that are regular users of conventional cars are less likely to use public transport than households that own electric vehicles (Figure 3.3). This finding could reflect the fact that households that use electric cars are also more likely to live in urban areas. On the other hand, it challenges findings postulating that early adopters of electric cars are predominantly located in suburban and rural areas (Plötz et al., 2014[15]).

Figure 3.3. Households with conventional cars use public transport less than those with electric cars

Percentage of respondents that report regularly using public transport
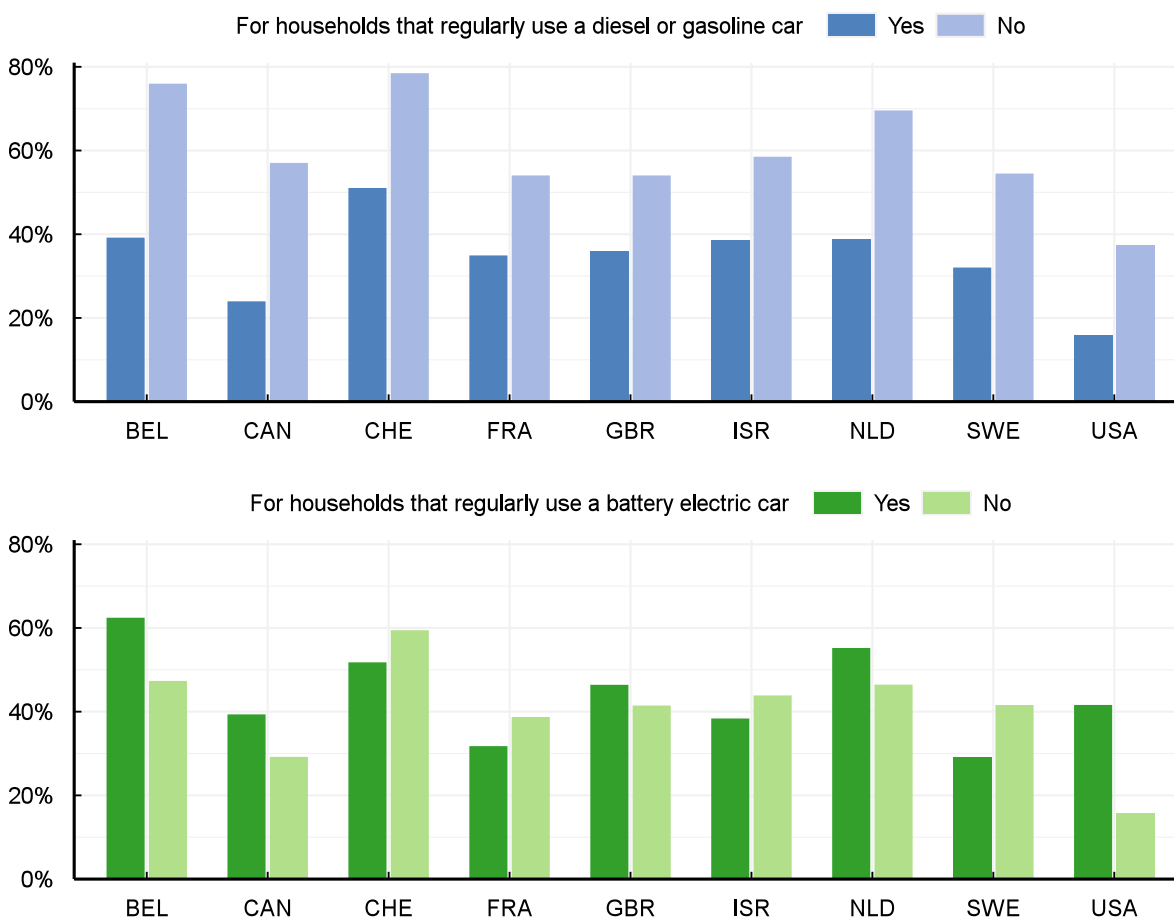
Note: This survey item asked respondents: "Does your household regularly use public transport?" For each type of equipment, respondents selected "Yes, I do", "Yes, someone else in the household does", "Neither of these" or "Don't know". The last two response options are exclusive. The figure shows the percentage of respondents indicating "Yes, I do". Respondents are grouped by their household's regular use of conventional or battery electric cars. These survey items asked respondents: "Do you or does anyone in your household regularly use any of the following (including company-provided equipment)? Please select all that apply."
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ⬛⬛📊 https://stat.link/g7z8h5

Regarding the potential to reduce car use, an average of 54% of regular car users indicate that improved public transport services would encourage them to use a car less (Table 3.1). This percentage is greatest in Israel (66%) and lowest in Canada and the United States (44% and 42%). Of these respondents, 35% live in urban areas.

Table 3.1. Better public transport would encourage 54% of car users to drive less

Percentage of respondents indicating that better public transport would encourage them to drive less

Country	Yes	Sample size
All countries	54%	7227
BEL	57%	737
CAN	44%	777
CHE	58%	707
FRA	65%	765
GBR	63%	670
ISR	66%	732
NLD	52%	736
SWE	54%	604
USA	42%	1499

Note: This survey item asked respondents: "Would better public transport services (e.g. more frequent, more accessible) lead you to use a car less?" The question was only asked of respondents who indicated that they used a car. Sample sizes are the following: BEL: 737, CAN: 777, CHE: 707, FRA: 765, GBR: 670, ISR: 732, NLD: 736, SWE: 604, USA: 1499.

Cheaper, more frequent and more extensive public transport networks are the most important improvements that respondents listed when asked what would encourage them to use their car less (Figure 3.4).[6] Overall, across the nine countries, 42% of respondents rate less expensive public transport as very important. This share is highest in Belgium and the Netherlands, at 49% and 50%, respectively. More frequent service is also cited as an important factor (41% overall) but appears particularly important for respondents in Israel (60%). Respondents in Israel also rate the ease of switching between different transport modes as more important than respondents in other countries. Improved hygiene and safety are less frequently considered important, except for respondents in the United States, who rated them of similar importance to other factors. Potential factors that could increase concern for safety in public transport trips include low ridership rates and infrequent service. It is important to note that some aspects of public transport may not be ranked among the most important because respondents are already satisfied with the current level of service. As a result, variation in responses may reflect variation in both service level provision as well as variation in individual preferences.

Figure 3.4. Measures that would encourage respondents to replace car use with public transport

Percentage of car users stating the improvements to public transport service that would be very important to encourage them to use a car less
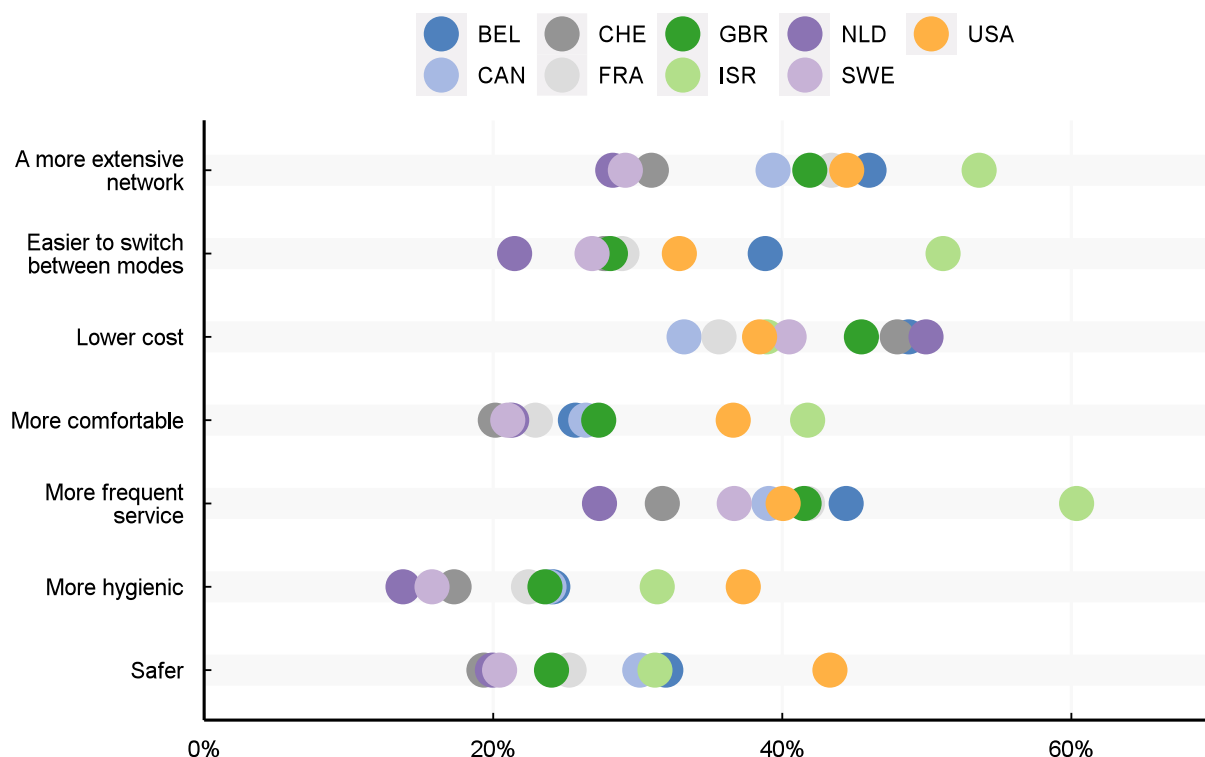
Note: This survey item asked respondents: "You indicated that better public transport services would lead you to drive a car less. Which aspects of public transport would be most important in changing your driving habits?". Respondents rated the importance of each aspect on a 5-point scale from "not at all important" to "very important". Only respondents who indicated that their household regularly uses a car and who stated that better public transport services would lead them to drive a car less where asked this question. Sample sizes are the following: BEL: 424, CAN: 339, CHE: 419, FRA: 490, GBR: 420, ISR: 484, NLD: 381, SWE: 318, USA: 611.
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ᯌ https://stat.link/j2k1fx

3.2.2. Long distance travel

The modes used for long distance travel also vary across countries. On average, 37% of total annual long-distance trips are taken by car, 16% by rail, 15% by bus, and 11% by plane. Respondents in Israel, as well as those in European countries, report taking on average 1.75 to 2 long-distance train trips per year. The exception is Switzerland, where respondents indicate taking an average of 3.5 such trips per year. Fewer trips by rail – an average 0.5 and 0.9 trips per year – are reported in Canada (0.5 trips on average a year) and the United States (0.9). This reflects differences in capacity for high-speed passenger rail services in North America compared to Europe and Israel (IEA, 2019[16]). Across all countries, respondents take an average of 1 to 2.3 leisure-related long-distance trips by bus and 1 to 1.6 trips by plane every year. Box 3.1 Box 3.1 reports survey findings on the impact of the COVID-19 pandemic on air travel.

Box 3.1. Respondents expect to fly slightly less following the COVID-19 pandemic

Respondents were asked whether they expect to change the frequency of their air travel following the COVID-19 pandemic. Confirming current trends in the airline industry (ICAO, 2023[17]), 57% of respondents in all countries expect to make the same number of trips per year by plane after the COVID-19 pandemic as they did before (Figure 3.5). For the group of all countries except the United States, an average of 33% of respondents expect to make fewer trips, while 14% expect to take more trips. Findings are similar for short and long-distance flights.

Figure 3.5. Most respondents' plans to fly remain unaffected by the COVID-19 pandemic

Average percentages across short and long-distance trips
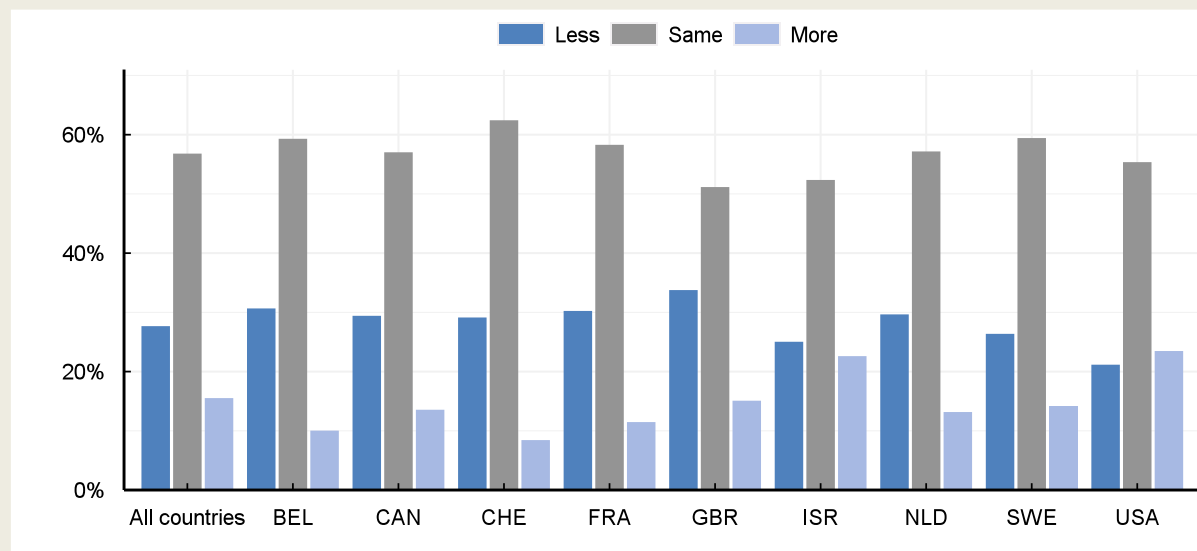
Note: This survey item asked respondents: "Compared to before the COVID-19 pandemic, how often do you expect to use planes for long trips (100 miles/200km or more one way) once the pandemic is well under control?" and "Compared to before the COVID-19 pandemic, how often do you expect to use the following modes of transport for short trips (less than 100 miles/200km one way) once the pandemic is well under control?".
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink 🔗 https://stat.link/pid87f

3.3. Households' use of conventional and electric cars

3.3.1. Conventional car use

Respondents report using a wide range of vehicle types (Figure 3.6), but the vast majority use a conventional motorised car or motorcycle, and more than 80% of potential car buyers still intend to purchase a car that runs at least in part on fossil fuels. On average 75% of households report that at least one household member uses a conventional car on a regular basis, ranging from 60% in Sweden to 87% in the United States. While not all respondents necessarily use these vehicles as their primary mode of transport or with the same intensity, these figures confirm that conventional cars remain a highly relevant

transport mode for most households. As such, while the electrification of the private vehicle fleet should deliver significant climate benefits, achieving this will require widespread household adoption of electric cars. On average, 7% of households report that at least one member of their household regularly uses a battery electric car, ranging from 4% in Canada to 10% in the United States.[7]

Figure 3.6. A conventional car is used regularly by 75% of households

Percentage of respondents indicating that they regularly use different types of cars
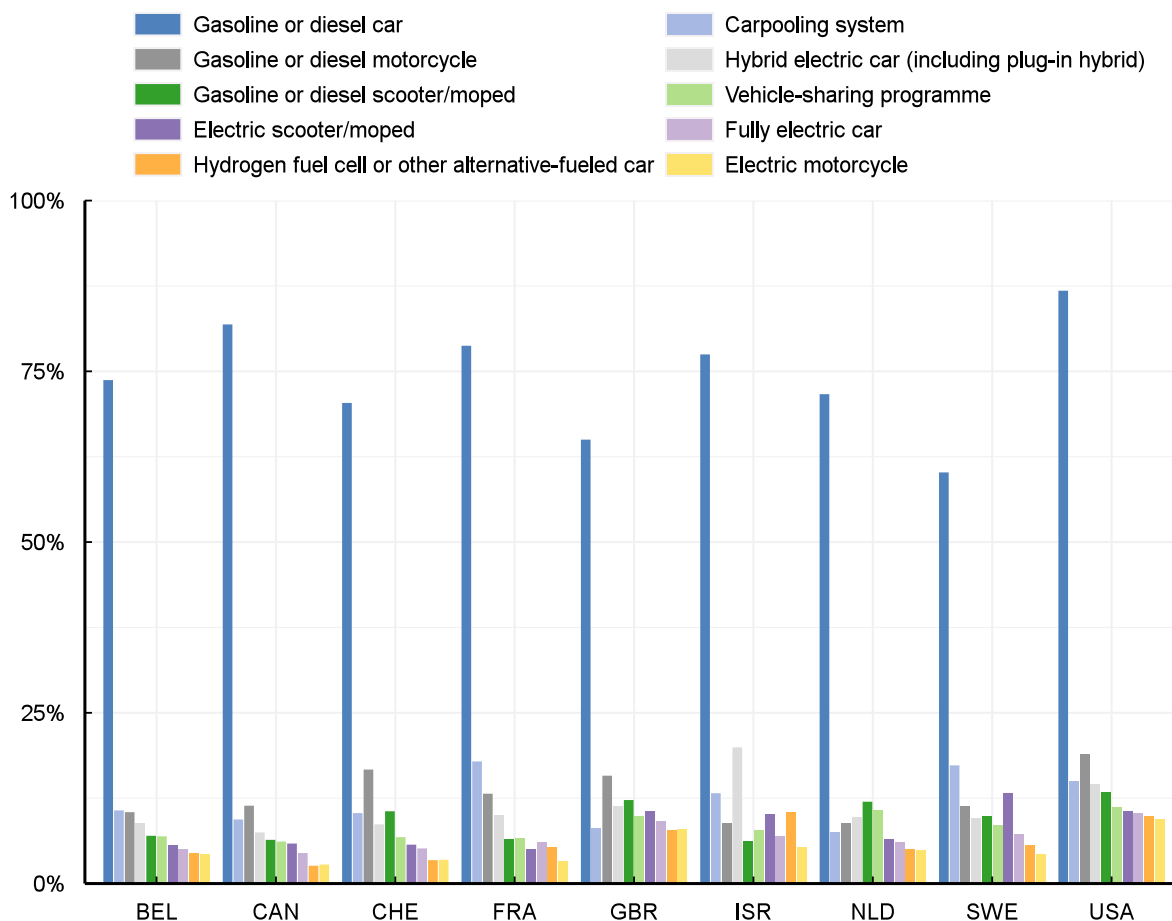
Note: This survey item asked respondents: "Do you or does anyone in your household regularly use any of the following (including company-provided equipment)? Please select all that apply."
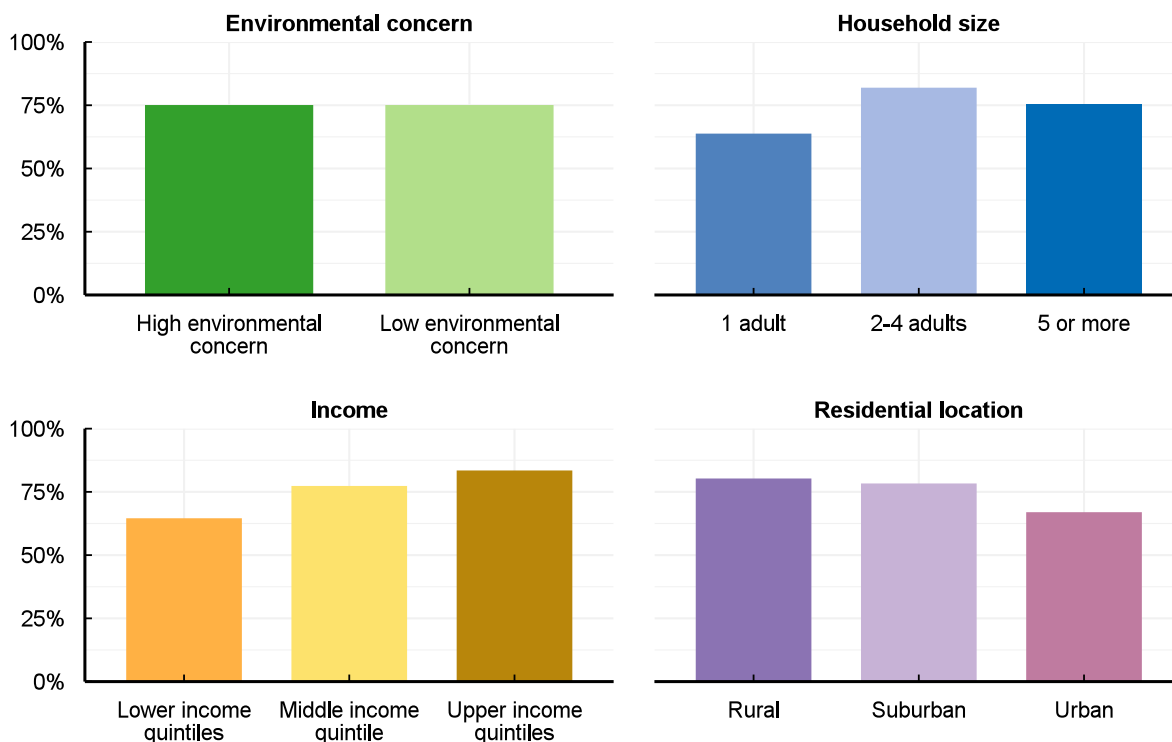Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink 🖳🔊 https://stat.link/ryef3v

Use of conventional cars appears higher for high-income households than for low-income households (Figure 3.7), which confirms existing empirical evidence. Single-adult households report less frequent use of a conventional car (an average of 64%) than households with between two and four adults (82%). Exceptions are the United States, Canada and Israel, where reported use increases slightly with the number of adults in the household. For the majority of countries, however, reported car use falls for households of five adults or more. Households with and without children do not report significantly different levels of conventional car use. In all countries, urban households report less car use than rural households.

Figure 3.7. Household income appears to be the strongest driver of conventional car use

Percentage of households regularly using a conventional car

Note: This survey item asked respondents: "Do you or does anyone in your household regularly use any of the following (including company-provided equipment)? Please select all that apply." Lower income quintiles refers to income quintiles 1 and 2, middle income quintile refers to income quintile 3 and upper income quintiles refers to income quintiles 4 and 5.
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ⌐Ⅷ∫⅊ https://stat.link/6dgfns

Some exceptions exist at the country level. In the United States, no differences in conventional car use are observed across income levels, and only small differences are observed across urban and rural areas. In Israel, only small differences are observed by residential location. Overall, across countries, despite its environmental impact, conventional car use does not vary significantly by level of environmental concern. The largest difference (7 percentage points) is observed in Switzerland.

These findings indicate the degree to which households rely on private cars for mobility needs, as well as the constraints and inconveniences associated with changing this behaviour. In urban areas, policies can seek to reduce conventional car use by improving the convenience of public transport options. In areas where there are fewer alternatives to car travel, policies can encourage a switch to electric cars by expanding charging infrastructure and improving their affordability.

3.3.2. Electric car use

While public transport users appear to be more environmentally concerned than non-users in all countries, this is less the case for electric car users (Figure 3.8).[8] Overall, those who are environmentally concerned report only slightly higher electric car use (9%) than those who are not environmentally concerned (7%). However, this pattern is not consistent across countries. Environmental concern is most strongly associated with electric car use in the United States, the United Kingdom and the Netherlands, where there are differences of 4 to 8 percentage points across these groups. In contrast, little difference is observed in

Switzerland, Israel and Sweden. In France, a greater percentage of those with lower environmental concern (9%) report regularly using an electric car than those with higher environmental concern (6%). A higher proportion of respondents (14%) report using electric cars in urban areas than in suburban and rural areas (8% and 4%, respectively).

A positive association between electric car use and income is apparent in Canada and the United States, confirming existing evidence (Sovacool et al., 2019[18]). However, this association is not observed in other countries. In fact, households in lower-income quintiles in Switzerland, France, Israel, the Netherlands and Sweden report greater electric car use than households in higher-income quintiles. This result could reflect households that regularly use them as part of a car sharing system, rather than owning them (Münzel et al., 2020[19]). The survey observations could also reflect regional differences in costs between conventional and electric cars after government incentives have been taken into account (IEA, 2022[20]). Finally, among car users, men generally report greater household use of electric cars than women (11% and 6% respectively). This also confirms existing evidence, which suggests that men and women differ in their levels of car ownership and use, as well as in their preferences for vehicle characteristics (Sovacool et al., 2019[21]).

Figure 3.8. Urban residents and those concerned about the environment are more likely to report regular use of electric cars

Percentage of households that regularly use an electric car among car-using households
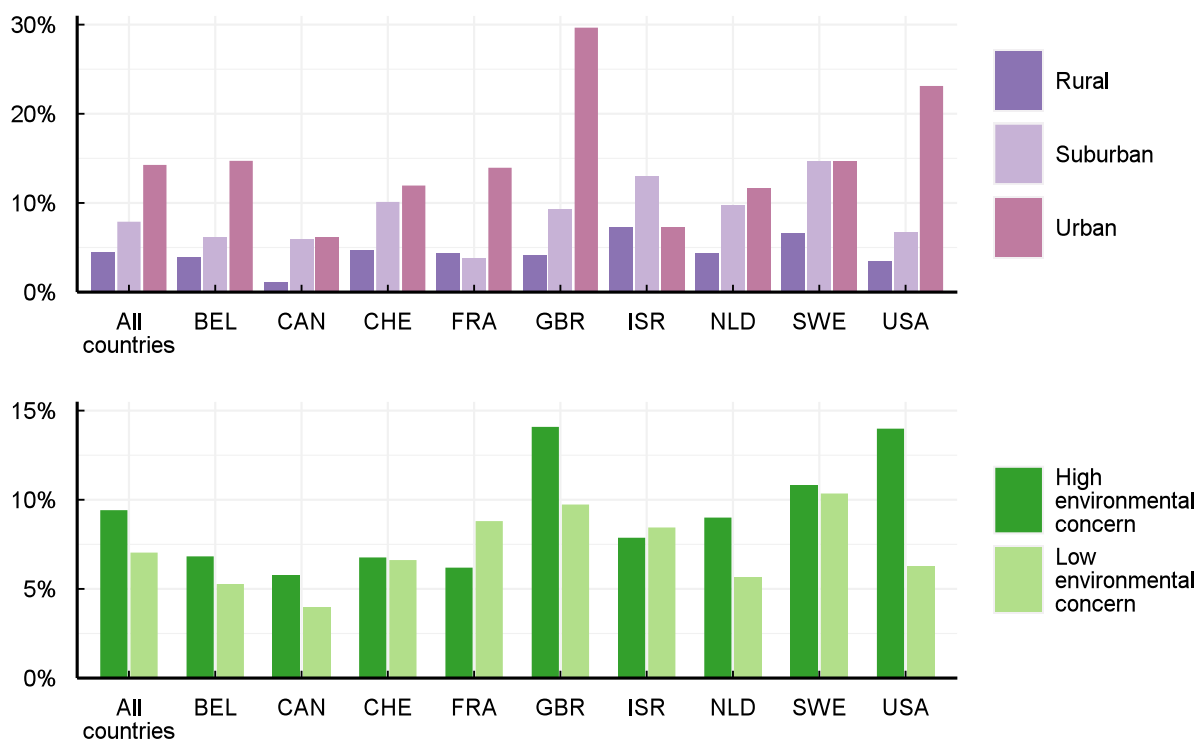
Note: This survey item asked respondents: "Do you or does anyone in your household regularly use a fully electric car?" The figure shows the percentage of respondents who answered "Yes".
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ᠍᠍᠍ https://stat.link/675mtk

Overall, 33% of respondents report that there are no charging stations for electric cars within three kilometres (two miles) of their residence (Figure 3.9), with another 26% not knowing whether there are charging stations available or not (as high as 40% in Israel).[9] Availability of charging stations appears to be highest in the Netherlands, where 33% of respondents reported that there is a charging station available where they regularly park their car (at home, at work or in a parking location). The virtual absence of electric car users among those who have little access to charging stations confirms the importance of charging infrastructure in facilitating electric car use (Hardman et al., 2018[22]). Some evidence suggests that range anxiety and other concerns about electric car use largely dissipate when a vehicle owner makes the switch to an electric car (AAA, 2020[23]).

Figure 3.9. Access to charging is a significant concern

Percentage of respondents reporting the availability of charging stations
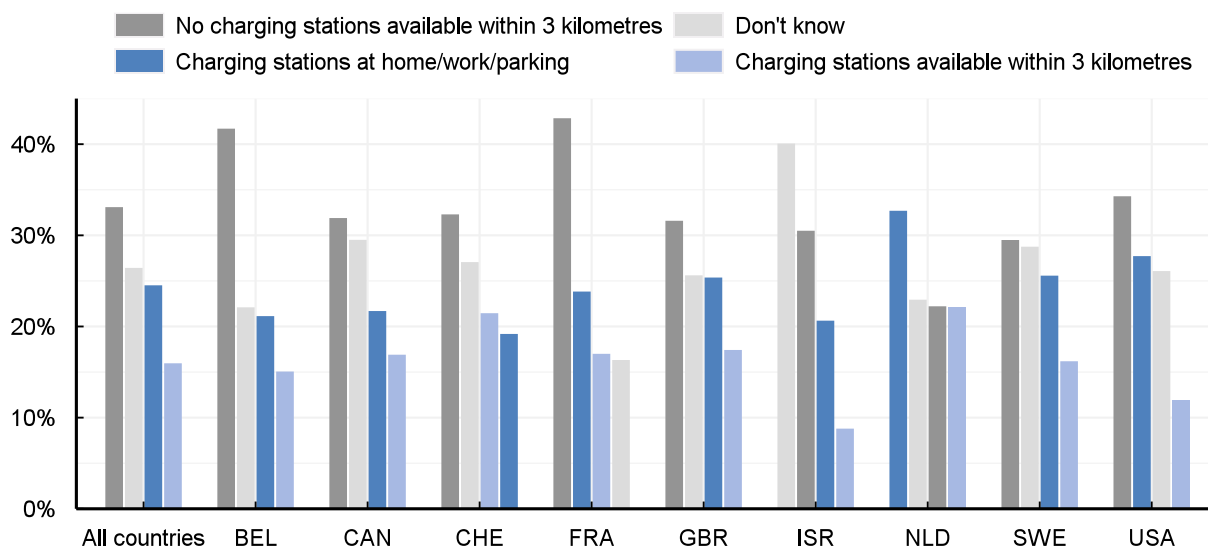
Note: This survey item asked respondents: "Please select which statements best describe the availability of charging stations for electric cars near you." Respondents may: (i) select one or more of the responses "no stations available", "charging at home/work/parking" and "(stations available) within 3 kilometres", or (ii) indicate that they "don't know". Respondents who report that charging is available both "at home/work/parking" as well as "within 3 kilometres" are counted in the group "at home/work/parking." While increasing the availability of charging infrastructure is currently a policy priority in many countries, these survey results reflect reported availability as of June/July 2022.
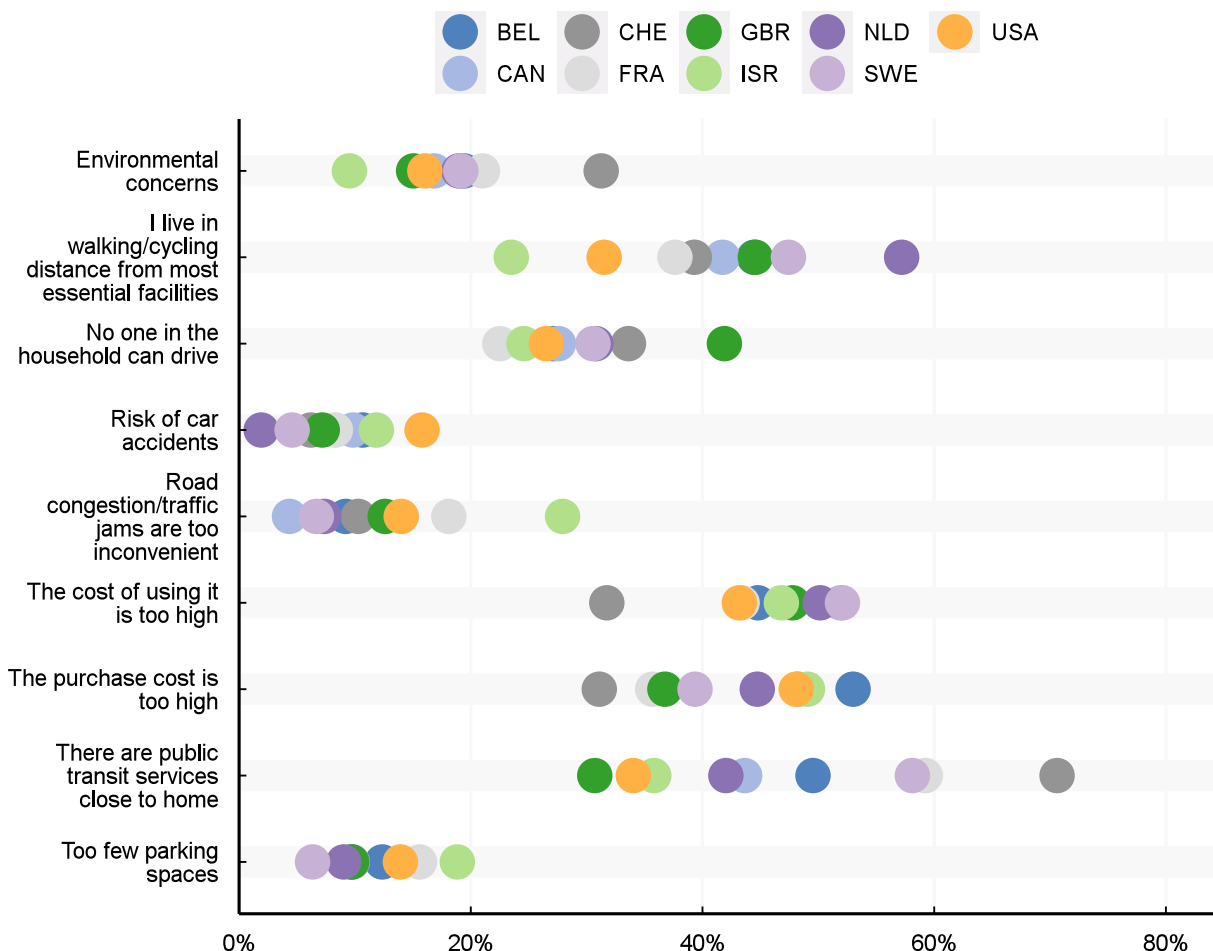Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ᐧᐧᐧ https://stat.link/op5cun

3.3.3. Reasons for not using a car

Overall, 24% of respondents reported that their household does not use a conventional car regularly. Of these, 48% cited the proximity of public transport as the main reason for not driving (ranging from 31% in the United Kingdom to 71% in Switzerland). Meanwhile, 46% (ranging from 32% in Switzerland to 52% in Sweden and Canada) ranked high running costs as an important reason (Figure 3.10). Having basic amenities within walking or cycling distance was important for 42% of respondents across countries, and up to 57% in the Netherlands. High purchase costs featured among the top reasons for 42% of this sample. Personal convenience rather than environmental concern appears to be an important driver of transport behaviour, with the latter cited by only 19% of the sample.

Figure 3.10. High costs and accessible public transport are an important reason why households do not use a car

Percentage of non-car users that cite reasons as important

Note: This survey item asked respondents: "Please rank up to three top reasons from 1 (most important) to 3 (third most important) why your household does not use a car." For each country, only the three most frequently chosen measures are displayed. Only respondents who indicated that their household does not use a car were asked this question. Sample sizes are the following: BEL: 138, CAN: 98, CHE: 177, FRA: 112, GBR: 219, ISR: 136, NLD: 146, SWE: 246, USA: 116.
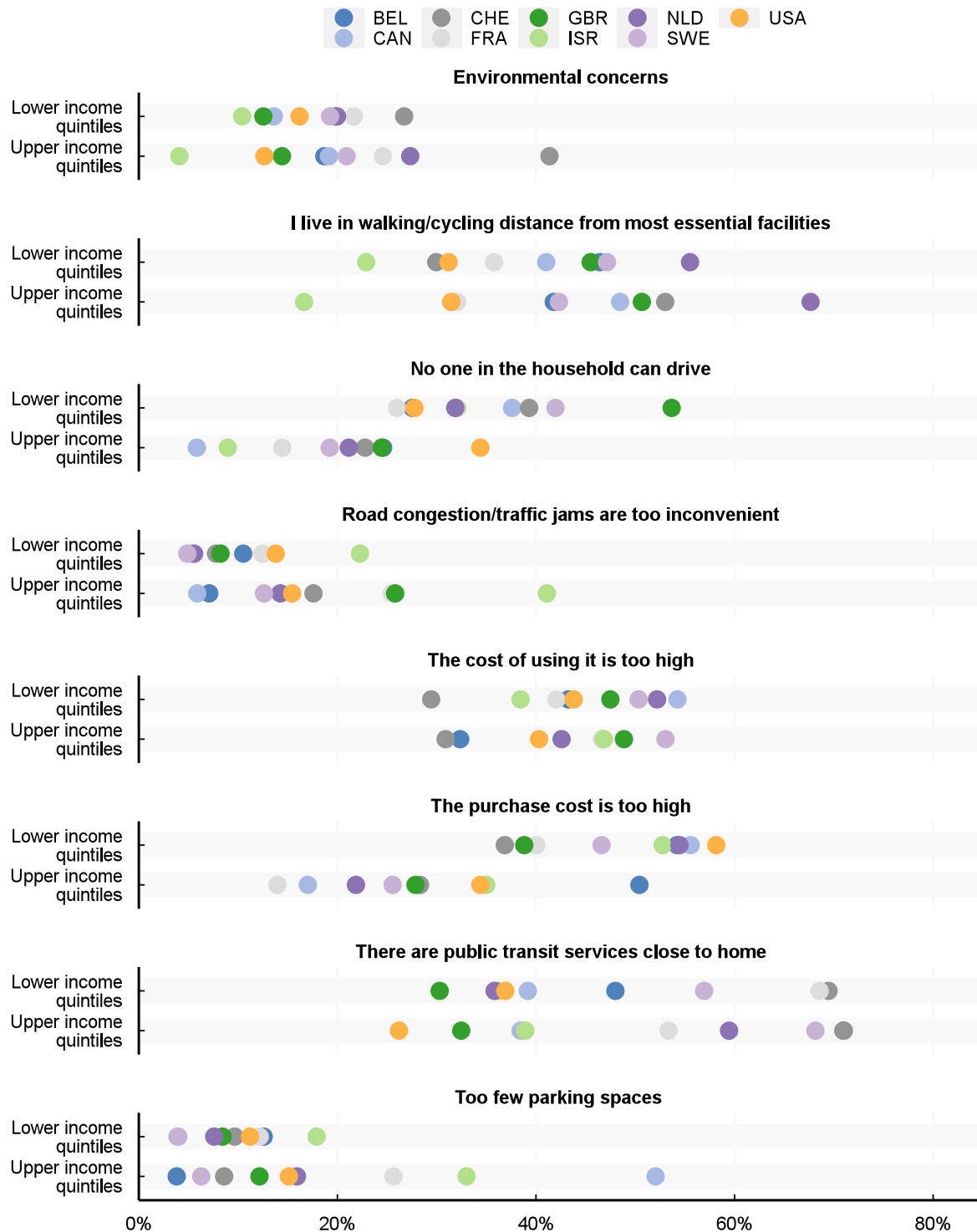Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ᐯᐱᔑᐯ https://stat.link/zxpnh2

Figure 3.11 examines if the reasons for not using a car differ between high and low-income households. Across countries, the availability of public transport and high running costs are important reasons for not using a car in both high and low-income households. Respondents in high-income households are more likely to cite living close to essential amenities,[10] while purchase costs are more frequently cited by households in the lower-income quintiles. In the United States, the top income quintiles report a lack of licensed drivers the most often across countries. Environmental concerns are cited most by high-income households in Switzerland as a reason for not using a car.

Figure 3.11. High and low-income households report different reasons for not using a car

Percentage of respondents ranking a reason among their top three most important reasons to not use a car

● BEL   ● CHE   ● GBR   ● NLD   ● USA
● CAN   ● FRA   ● ISR   ● SWE

Environmental concerns

I live in walking/cycling distance from most essential facilities

No one in the household can drive

Road congestion/traffic jams are too inconvenient

The cost of using it is too high

The purchase cost is too high

There are public transit services close to home

Too few parking spaces

Note: This survey item asked respondents: "Please rank up to three top reasons from 1 (most important) to 3 (third most important) why your household does not use a car." The figure shows the percentage of respondents ranking a reason among their top three. Only respondents who indicated that their household does not use a car were asked this question. Sample sizes are the following: BEL: 138, CAN: 98, CHE: 177, FRA: 112, GBR: 219, ISR: 136, NLD: 146, SWE: 246, USA: 116.

Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink 🖳 https://stat.link/4rbifw

3.4. Support for transport policies

When asked what policies respondents would support to reduce the environmental impacts of cars, the majority (77%) listed improved public transport (Figure 3.12). This high level of support cuts across income levels, levels of environmental concern and residential location (Figure 3.13). Even among those expressing no trust in the national government, 75% support or strongly support policies to improve public transport. Other policies for which respondents most frequently express support are promoting teleworking (60%), subsidies for low-emission or efficient cars (60%), stricter fuel efficiency standards for new cars (56%) and providing more detailed environmental labels for cars (51%). Given the need to electrify transport activity in areas where there are fewer alternatives to car travel, these findings suggest that public reception of measures to increase the uptake of electric cars is likely to be favourable.

Respondents disagreed most with charging a fee per kilometre driven (57%) and increasing parking fees or reducing parking spaces (61%). Lower levels of support were also generally expressed for a tax on CO_2 emissions or inefficient cars (36%), fees to access city centres (33%), a fee per kilometre driven (20%) and parking fees (18%). However, there is considerable cross-country variation. In Canada, Israel, Sweden and Switzerland, the share of households that disagree with charging a fee per kilometre driven (66%) is significantly higher than in Belgium and the Netherlands (39%). Similarly, the share of households in Switzerland (51%) that disagree with reducing speed limits on the highways is higher than in the United States (37%) and almost twice the share in the United Kingdom (28%). The yellow vest protests in France due to increases in a fuel tax and the uprising in Chile following a hike in public transport prices illustrate the highly controversial nature of some transport policies.

Those with high environmental concern are more likely to support all the policies to reduce the environmental impact of car use (Figure 3.13). While this group's support is lower for some measures – such as a tax on carbon emissions and access restrictions to city centres – it is still twice as high as for those with low levels of environmental concern. Those expressing trust in the national government and those living in urban areas are also systematically more likely to support all types of policies to reduce car use. The unpopularity of measures that cost households money may in part be an artefact of respondents' high dependence on cars, including car users who are environmentally concerned. Overall, these findings suggest that complementary measures could increase support for these policies (e.g. earmarking revenues from tax-based measures for investing in improving public transport). In addition, certain population groups could be targeted for communication strategies to increase support.

In the 2011 EPIC survey, respondents also indicated a high level of support for investing in public transport, but even higher support for providing subsidies for low-emissions or efficient cars (OECD, 2013[24]). As such, it appears that reported public support for subsidies for low-emissions or fuel-efficient vehicles has waned somewhat over time. This could in part reflect falling costs of electric cars over this period (IEA, 2020[25]). However, support for public transport provision remains strong, whereas in both 2011 and 2022, tax-based measures received the least support.[11]

Figure 3.12. Improving public transport is the most popular policy measure to reduce the environmental impact of conventional cars

Percentage of respondents agreeing or disagreeing with policy measures
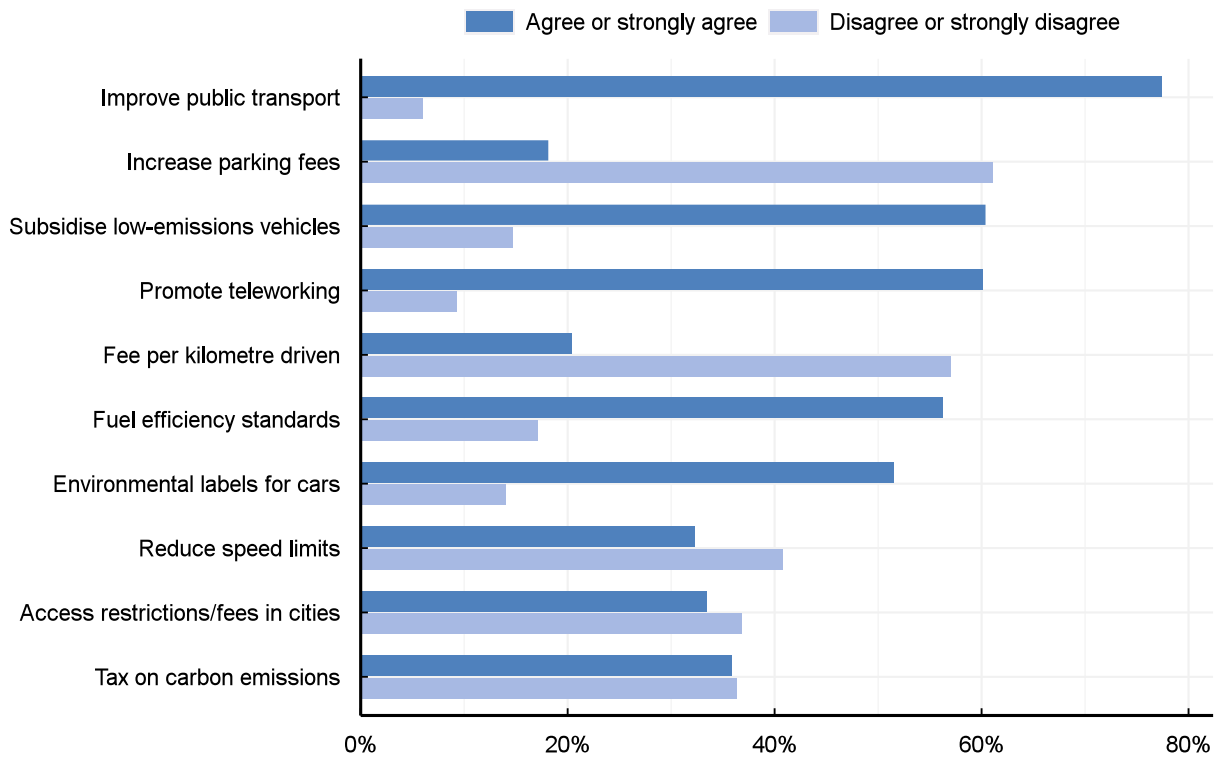
Note: This survey item asked respondents: "What do you think about the following actions governments can take to reduce environmental impacts from cars?". Respondents rated each policy measure on a 5-point scale from "strongly disagree" to "strongly agree".
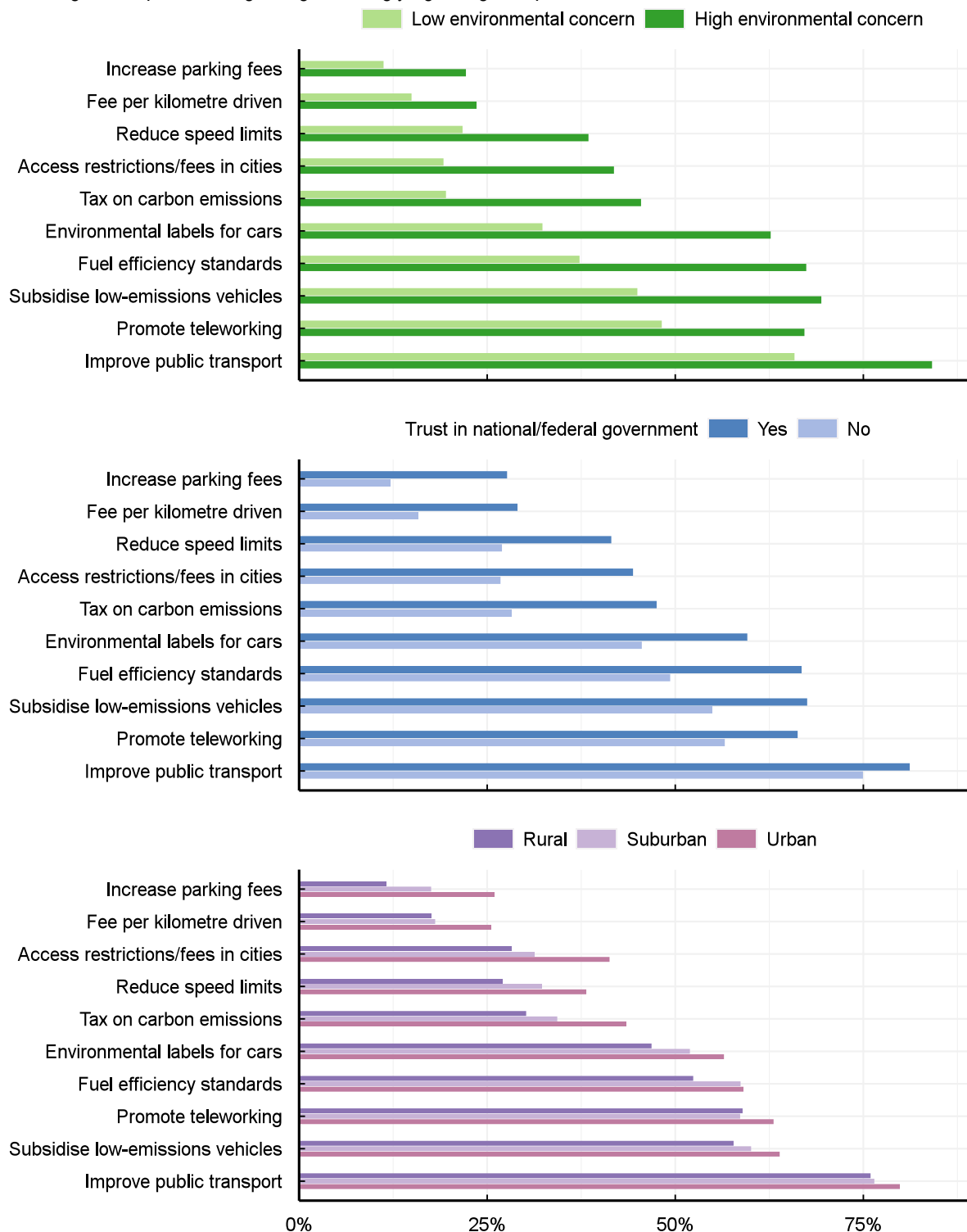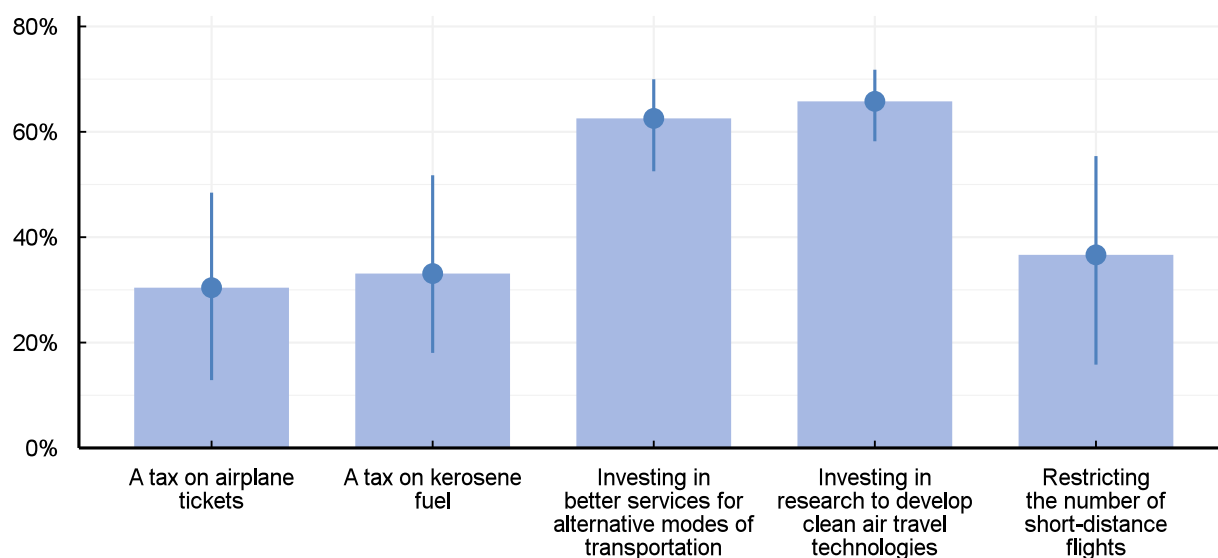Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ᐧᐧᓯᔅᐳ https://stat.link/e7j4us

Figure 3.13. Support for policies to reduce cars' environmental impact varies by environmental concern, trust in government and residential location

Percentage of respondents agreeing or strongly agreeing with policies

Note: This survey item asked respondents: "What do you think about the following actions governments can take to reduce environmental impacts from cars?". Respondents rated their agreement on a 5-point scale from "strongly disagree" to "strongly agree".
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink 🖳 https://stat.link/24gpsx

There are clear differences in respondents' support for the various policies to reduce the environmental impacts of air travel (Figure 3.14). Investing in research to develop clean air travel technologies received the greatest support (66%), closely followed by investing in better services for alternative modes of transportation (63%). Less overall support is expressed for regulatory measures such as a tax on airplane tickets, a tax on kerosene fuel or restricting the number of short-distance flights, although respondents in the Netherlands, Switzerland and Belgium are the most supportive of these measures. This contrasts with the particularly low levels of support in Canada, Israel and the United States.

Figure 3.14. Support for policy measures to reduce the environmental impacts of flying is highest for investment in better alternatives and cleaner technologies

Percentage of respondents supporting or strongly supporting a policy: cross-country averages and range

Note: This survey item asked respondents: "To what extent would you support the following policies aiming to reduce environmental impacts from air travel?". Respondents rated their agreement with each of the policy measures on a 5-point scale from "I would be strongly against" to "I would strongly support". The dot represents the cross-country average, and the blue line shows the range of country-level support.
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ▓▓ᗶᒲ https://stat.link/lm8xov

References

AAA (2020), *Owning an Electric Vehicle is the Cure for Most Consumer Concerns*, https://newsroom.aaa.com/2020/01/aaa-owning-an-electric-vehicle-is-the-cure-for-most-consumer-concerns/ (accessed on 27 April 2023). [23]

Boisjoly, G. et al. (2018), "Invest in the ride: A 14 year longitudinal analysis of the determinants of public transport ridership in 25 North American cities", *Transportation Research Part A: Policy and Practice*, Vol. 116, pp. 434-445, https://doi.org/10.1016/J.TRA.2018.07.005. [28]

Bongardt, D. et al. (2019), *Sustainable Urban Transport: Avoid-Shift-Improve (A-S-I)*, Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH, Eschborn, https://www.transformative-mobility.org/assets/publications/ASI_TUMI_SUTP_iNUA_No-9_April-2019.pdf (accessed on 16 June 2022). [26]

Burrows, M., C. Burd and B. Mckenzie (2021), *Commuting by Public Transportation in the United States: 2019*, United States Census Bureau, http://www.census.gov/programs-surveys/acs/methodology (accessed on 27 February 2023). [27]

Creutzig, F. et al. (2022), "Demand-side solutions to climate change mitigation consistent with high levels of well-being", *Yamina Saheb*, Vol. 20, https://doi.org/10.1038/s41558-021-01219-y. [7]

EPRS (2022), *CO2 Emission Standards for New Cars and Vans: 'Fit for 55' package*, European Parliamentary Research Service briefing, Brussels, https://www.europarl.europa.eu/RegData/etudes/BRIE/2022/698920/EPRS_BRI(2022)698920_EN.pdf. [14]

Gardner, B. and A. Rebar (2019), "Habit formation and behavior change", *Oxford Research Encyclopedia of Psychology*, https://doi.org/10.1093/ACREFORE/9780190236557.013.129. [9]

Goodwin, P. (2004), *The Economic Costs of Road Traffic Congestion*, University College London (UCL), London, https://discovery.ucl.ac.uk/id/eprint/1259/. [4]

Hardman, S. et al. (2018), "A review of consumer preferences of and interactions with electric vehicle charging infrastructure", *Transportation Research Part D: Transport and Environment*, Vol. 62, pp. 508-523, https://doi.org/10.1016/J.TRD.2018.04.002. [22]

ICAO (2023), *Air traffic recovery is fast-approaching pre-pandemic levels*, International Civil Aviation Organization, Montreal, https://www.icao.int/Newsroom/Pages/Air-traffic-recovery-is-fastapproaching-prepandemic-levels.aspx (accessed on 6 February 2023). [17]

IEA (2022), *Global EV Outlook 2022: Securing supplies for an electric future*, OECD Publishing, Paris, https://doi.org/10.1787/c83f815c-en (accessed on 7 September 2022). [20]

IEA (2020), "Average price and driving range of BEVs, 2010-2019", *World Investment 2020*, https://www.iea.org/data-and-statistics/charts/average-price-and-driving-range-of-bevs-2010-2019 (accessed on 28 February 2023). [25]

IEA (2019), *The Future of Rail Opportunities for Energy and the Environment*, International Energy Agency, Paris, https://doi.org/10.1787/9789264312821-en. [16]

IEA (2016), *Energy and Air Pollution: World Energy Outlook Special Report*, International Energy Agency, Paris, https://www.iea.org/reports/energy-and-air-pollution. [2]

IPCC (2022), *Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, https://doi.org/10.1017/9781009157926. [5]

ITF (2021), *ITF Transport Outlook 2021*, OECD Publishing, Paris, https://doi.org/10.1787/16826a30-en. [1]

ITF (2021), *Reversing Car Dependency: Summary and Conclusions*, ITF Roundtable Reports, No. 181, OECD Publishing, Paris, https://doi.org/10.1787/bebe3b6e-en. [6]

ITF (2017), *Economic Benefits of Improving Transport Accessibility*, International Transport Forum, https://doi.org/10.1787/9c73ac17-en (accessed on 28 February 2023). [13]

Münzel, K. et al. (2020), "Explaining carsharing supply across Western European cities", *International Journal of Sustainable Transportation*, Vol. 14/4, pp. 243-254, https://doi.org/10.1080/15568318.2018.1542756. [19]

OECD (2022), *Redesigning Ireland's Transport for Net Zero: Towards Systems that Work for People and the Planet*, OECD Publishing, Paris, https://doi.org/10.1787/b798a4c1-en. [12]

OECD (2021), *Reconciling housing and the environment*, OECD Publishing, Paris, https://doi.org/10.1787/b453b043-en. [11]

OECD (2018), *Rethinking Urban Sprawl: Moving Towards Sustainable Cities*, OECD Publishing, Paris, https://doi.org/10.1787/9789264189881-en. [10]

OECD (2016), *The Economic Consequences of Outdoor Air Pollution*, OECD Publishing, Paris, https://doi.org/10.1787/9789264257474-en. [3]

OECD (2013), *Greening Household Behaviour: Overview from the 2011 Survey*, OECD Studies on Environmental Policy and Household Behaviour, OECD Publishing, Paris, https://doi.org/10.1787/9789264181373-en. [24]

Plötz, P. et al. (2014), "Who will buy electric vehicles? Identifying early adopters in Germany", *Transportation Research Part A: Policy and Practice*, Vol. 67, pp. 96-109, https://doi.org/10.1016/j.tra.2014.06.006. [15]

Sovacool, B. et al. (2019), "Income, political affiliation, urbanism and geography in stated preferences for electric vehicles (EVs) and vehicle-to-grid (V2G) technologies in Northern Europe", *Journal of Transport Geography*, Vol. 78, pp. 214-229, https://doi.org/10.1016/J.JTRANGEO.2019.06.006. [18]

Sovacool, B. et al. (2019), "Are electric vehicles masculinized? Gender, identity, and environmental values in Nordic transport practices and vehicle-to-grid (V2G) preferences", *Transportation Research Part D: Transport and Environment*, Vol. 72, pp. 187-202, https://doi.org/10.1016/j.trd.2019.04.013. [21]

Weis, C. et al. (2010), *Models of mode choice and mobility tool ownership beyond 2008 fuel prices*, SAGE PublicationsSage CA: Los Angeles, CA, https://doi.org/10.3141/2157-11. [8]

Notes

[1] Values expresses in constant (2010) USD, purchasing power parity (PPP).

[2] Also known as the "avoid, shift, improve approach" (Bongardt et al., 2019[26]); see Box 1.1 in Chapter 1.

[3] See Annex B on the design and implementation of the EPIC survey and on the quality of the panel of respondents.

[4] Respondents were asked about their primary transport modes for work, leisure and childcare-related trips. Only responses from work-related trips are reported, as qualitative differences across trip purposes were not strikingly large, including at the country level.

[5] This effect may reflect large cities in the United States. In smaller cities across the country, public transport tends to be used primarily by lower-income households (Burrows, Burd and Mckenzie, 2021[27]).

[6] These findings confirm other research into what determines public transport use (Boisjoly et al., 2018[28]).

[7] Dividing the household-level electric car use values reported here by average household size (1.97 adults) yields figures that better approximate per capita use.

[8] Environmental concern is reported at the individual level; electric vehicle use is reported at the household level (i.e. if at least one member of the household regularly uses one).

[9] Although policies are currently in place in many countries to increase the availability of electric car charging infrastructure, these results reflect the circumstances in June/July 2022.

[10] This finding is not driven by differences in income across residential areas, as similar proportions of those living in urban, suburban, and rural areas are in the upper-income quintiles: 36%, 36% and 34%, respectively.

[11] The 2011 survey asked about "higher fuel taxes" and the 2022 survey asked about "a tax on carbon emissions or inefficient cars."

4 Household behaviour and waste practices

Growing volumes of municipal solid waste threaten environmental quality and pose environmental safety hazards. Food waste is an important component of household waste, contributing to between 8-10% of total greenhouse gas emissions. This chapter presents observations from the third round of the OECD Survey on Environmental Policies and Individual Household Behaviour Change (EPIC) on households' waste-related practices: their use of collection services for recyclables and mixed waste, their food waste habits, and actions to reduce waste by reusing and repairing. It also analyses the impact of waste charging and collection policies on households' waste behaviour.

Key findings

- **Households act to reduce waste by engaging in low-effort activities, but struggle to change their consumption habits**. Overall, 83% of households report frequently using reusable shopping bags and over half report frequently repairing damaged items and buying less environmentally harmful products. However, considerably fewer buy second-hand (37%), or rent or borrow items (22%). Households concerned about the environment are more likely to reduce consumption, suggesting that environmental concern can be leveraged in efforts to reduce waste generation, for example through targeted communication efforts.

- **Household engagement in recycling can be improved by making it more convenient**. Average reported recycling rates for all materials range from 34% in Israel to 71% Switzerland. These rates are generally lower for food waste separated for composting, ranging from 26% in Israel to 58% in Sweden. The availability of recycling collection services is associated with less mixed waste generation. Households with services that collect recycled waste from their residence generate 42% less waste than households with no such service. This share falls to 26% for households that take their recycling to drop-off centres. Households report that greater financial incentives (43%), the option to have waste collected at home (37%) and more accessible collection or drop-off services (39%) would encourage them to separate a greater share of their waste for recycling or composting.

- **Expanding charging schemes for mixed waste disposal could be considered for improving waste management.** Households charged for the amount of mixed waste they generate report composting 55% of their food waste, while those that are not charged report composting 35% of their food waste. However, 19% of respondents – and up to 41% in Israel – report that they are not charged for disposal services. The expansion of charging schemes for mixed waste disposal is therefore a priority for reducing waste generation.

- **Better information could yield additional reductions in waste generation and increases in recycling.** For example, on average 14% of households report still disposing of electric and electronic waste along with mixed waste (up to 27% in Israel). Households also indicate that they throw spoiled food away primarily because they forgot about it (36%) or cooked or bought too much (22%). Many households cited a lack of space (27%) and that they perceived composting as unpleasant (17%) as the main reasons for not composting more. Clarifying and standardising expiration date labels (e.g. distinguishing between "expiry" and "best-before" dates) and providing information on how to safely store food were identified as helpful tools for reducing food waste.

4.1. Introduction

Demographic change, economic growth and the accompanying lifestyle changes are the main factors contributing to growing material use and solid waste (OECD, 2019[1]; Diaz-Farina, Díaz-Hernández and Padrón-Fumero, 2020[2]; Karri, Ravindran and Dehghani, 2021[3]). While the material intensity of economies is projected to decrease over time with improved technology and a shift in economic activity towards less resource-intensive sectors, there are still numerous environmental consequences related to the extraction and processing activities required to obtain resources, use and dispose of them (OECD, 2019[1]).

Sustainable material use has been a political priority for decades (UNEP, 2022[4]; UN, 1992[5]; OECD, 2008[6]; UN, 2015[7]). This has contributed to a political focus on reducing waste generation and enhancing the resource efficiency of economies and the circularity of materials use, commonly referred to as circular economy (OECD, 2022[8]). Related policy measures include those that address individual or household waste generation by encouraging recycling, reuse and repair, as well as improved product durability and enhanced or extended product use. Shared economy approaches such as car sharing and purchasing items second-hand are examples of enhanced or extended product use.

The management of solid waste nonetheless remains a challenge. Definitions of municipal solid waste vary, but in general the term refers to the waste generated, collected, transported and disposed of within a municipality (Periathamby, 2011[9]). Across country contexts, this may include waste generated by households and commercial, transportation, industrial, health and service sectors. The focus in this chapter is on solid waste produced by households, including biodegradable food waste, mixed waste, and electrical and electronic waste.

Global municipal solid waste was estimated at just over 2 billion tonnes in 2016,[1] a third of which was dumped, i.e. it was uncollected, thrown in waterways, burned or treated by other methods, or not accounted for by any disposal method (Kaza et al., 2018[10]). By 2050, global municipal solid waste could increase to 3.4 billion tonnes, outpacing projected population growth (Kaza et al., 2018[10]). Although the projected pace of growth in municipal solid waste is more than twice as high in middle-income countries than in high-income countries, there is no established relationship between economic growth and waste generation.[2]

Average waste generation per capita in OECD countries was over 530kg in 2020[3] (OECD, 2022[11]). Of this waste, 37% was recycled, composted or recovered; 43% was buried in landfills, and 20% was incinerated and energy recovered from the process. Between 2000 and 2020, the share of waste in OECD countries that was diverted from the waste stream and transformed into products with potential economic or ecological benefits increased from 27% to 37%. Over the same period, the share buried in landfills declined from 56% to 43%, while incineration with energy recovery increased from 17% to 20% (OECD, 2022[11]).

When not managed properly, municipal solid waste adversely affects environmental quality and poses environmental safety hazards. Globally, mismanaged waste is the main source of leakage of macroplastics such as plastic bottles and packaging into the environment (OECD, 2022[12]). In 2019, an estimated 22 million tonnes of plastic leaked into the environment. Macroplastics accounted for 88%, primarily attributed to inadequate waste collection and disposal.[4] The leakage of plastic waste into the environment doubled between 2000 and 2019, with non-OECD countries accounting for 86% (OECD, 2022[12]). Mismanaged waste can also adversely affect human health and social equity (Khatiwada et al., 2021[13]). Landfilling, for example, can contribute to underground water and marine pollution due to the leaching and run-off of organic, inorganic and other substances, as well as to air pollution due to the suspension of particles and release of odours (Siddiqua, Hahladakis and Al-Attiya, 2022[14]).

Food waste is an important component of household waste, and one that has been receiving increasing attention in recent years (Dou and Toth, 2021[15]). Global estimates suggest that as much as one-third of food produced for human consumption is lost or wasted every year (UNEP, 2021[16]). Between 2010 and

2016, global food loss and waste was responsible for 8-10% of total greenhouse gas emissions (IPCC, 2022[17]). In Europe, 65% of total food waste has been attributed to households and food service entities (Stenmarck et al., 2016[18]); in the United States, households account for about 40% of total food waste generation (EPA, 2023[19]). Food loss and waste is in part due to supply-side determinants (e.g. the amount of food produced), but demand-side determinants (e.g. consumer choices, preservation and use) are also important drivers (Verma et al., 2020[20]).

Measures to promote a more circular economy reduce the need for new production and support demand for more sustainable products (CISL, 2022[21]; Material Economics, 2018[22]). In the European Union context, evidence indicates that such measures have the potential to reduce carbon dioxide (CO_2) emissions by as much as 296 million tonnes (or 56%) per year by 2050 (Material Economics, 2018[22]). Policy mixes to promote a more circular economy should include economic instruments, regulations and information-based and voluntary approaches. This includes ensuring affordable waste collection services, product taxes, deposit-refund schemes, disposal fees, and environmental labelling[5] (OECD, 2021[23]). The successful design and implementation of such measures requires an understanding of households' current engagement in, and contributions to, waste generation and disposal.

This chapter provides an overview of the data gathered from the third round of the OECD Survey Environmental Policies and Individual Behaviour Change (EPIC) on a variety of household decisions related to waste generation and management.[6] It explores in particular, households':

- actions to reduce, reuse and repair
- the coverage of mixed waste and recycling collection services, and charging schemes
- generation of mixed waste and recyclable waste
- food waste.

For each of these areas, the chapter uses representative country samples to analyse differences in respondents' behaviours and attitudes across relevant variables, including income level, residence type and location, ownership status and level of environmental concern.

4.2. Reduce and reuse behaviour

Household actions to reduce waste (e.g. reducing consumption and reusing or repairing when possible) are an important component of waste management. The EPIC Survey asked households how often they engage in nine actions to reduce waste (Figure 4.1). Using reusable shopping bags was the most common action, with 83% of households reporting doing so frequently. Over half report using refillable containers (60%), repairing damaged items instead of buying new ones (55%), and buying products that are less environmentally harmful (51%). However, fewer households report acting to reduce waste upstream of the point of disposal, such as by buying second-hand (37%), renting or borrowing items (22%) and making homemade products (20%). Using reusable shopping bags is most common in the United Kingdom, where 93% of households report often or always doing so, and least common in the United States, where 70% report doing so. Regular use of refillable containers is practised by between 47% of respondents in Israel and 73% in Switzerland, and buying second-hand items is practised by between 20% of respondents in Israel and 44% in the United Kingdom. Respondents report making homemade products least in the Netherlands (11%), and most in the United States (28%).

Figure 4.1. Certain waste reduction practices are more common than others

Percentage of respondents often or always engaging in the following waste reduction practices (bars) and minimum and maximum country-level engagement (line)
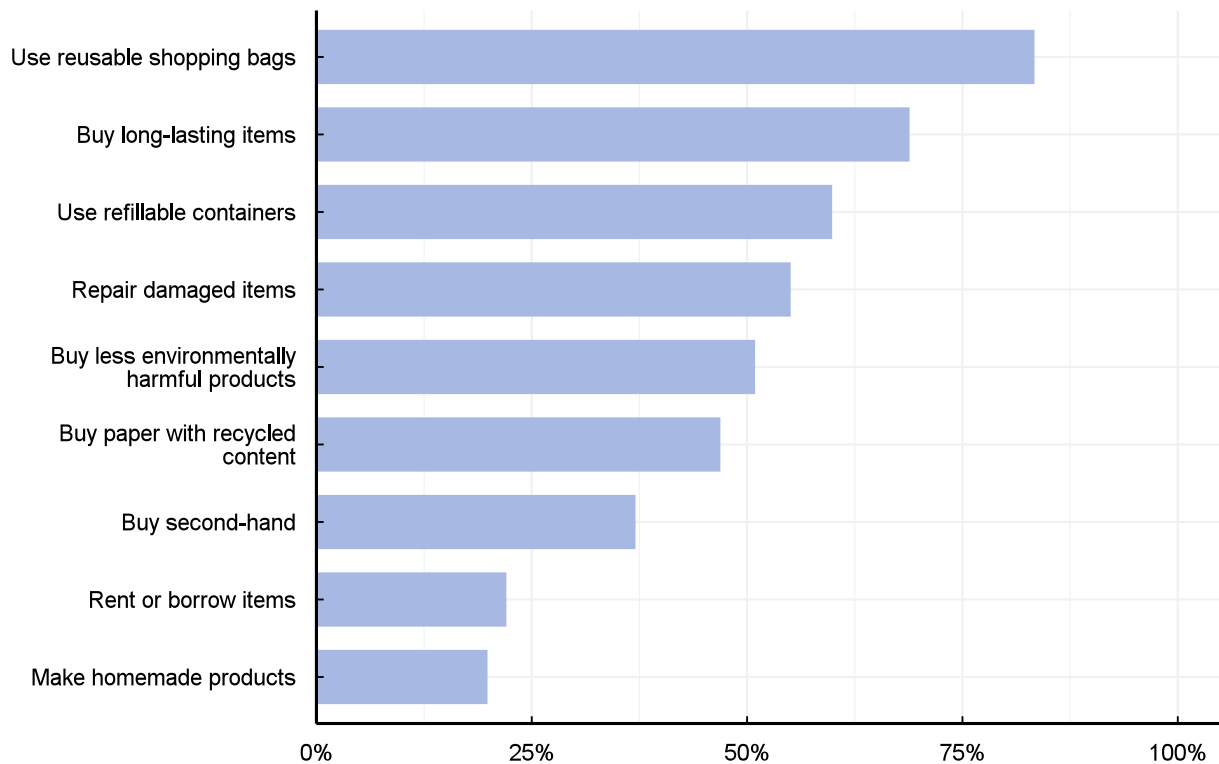
Note: This survey item asked respondents: "How often does your household do the following?" For each item, respondents selected never, occasionally, often, always or don't know. The bar represents the percentage of respondents across all countries engaging in the practice and the blue line shows the range of country-level engagement.
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ᐧᐧᐧᐧ https://stat.link/6ygtzm

Households' waste reduction practices were analysed against several characteristics (age, income level, having children in the household and level of environmental concern) (Figure 4.2). While older respondents report using reusable shopping bags slightly more than younger respondents, they engage less in other reduce and reuse behaviours such as renting or borrowing items, making homemade products and buying second-hand. Households with children report greater engagement in buying second-hand, renting and borrowing, and making homemade products than households without children. Compared with low-income households, high-income households more frequently report that they buy high-quality items that will last, but they buy second-hand items less frequently.

Environmental concern appears to be associated with increased engagement in all types of behaviours, but is most strongly associated with buying products that are less environmentally harmful (e.g. cleaning products) and products with recycled content. These findings point to the potential impact of targeted communication efforts to further encourage such behaviour among those who are environmentally concerned (Heo and Muralidharan, 2017[24]; Grimmer and Woolley, 2014[25]). Concern for plastic pollution has no significant impact on waste reduction practices.

Figure 4.2. Households concerned about the environment are more likely to reduce and reuse

Percentage of respondents indicating that their household often or always engages in waste reduction practices
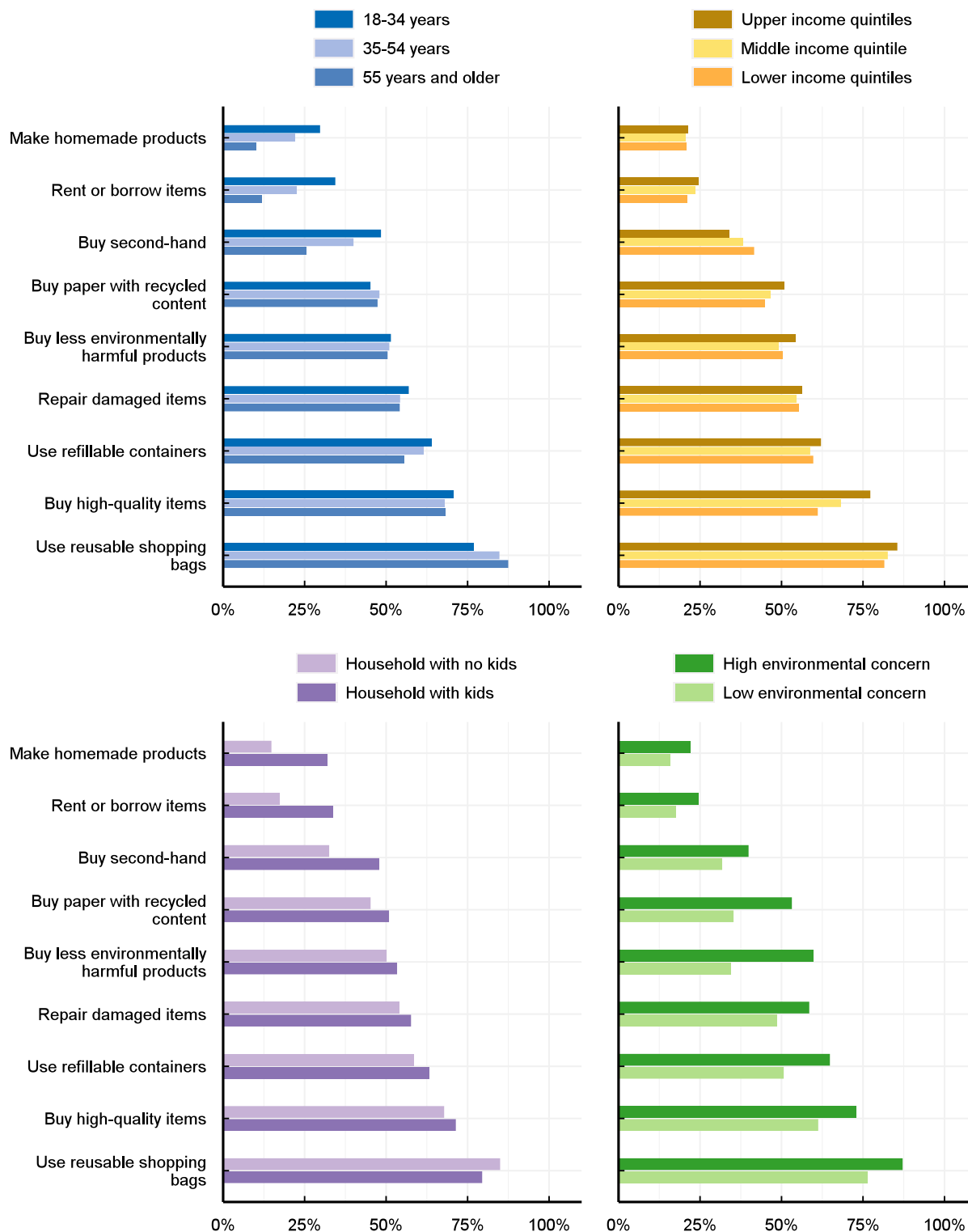
Note: This survey item asked respondents: "How often does your household do the following?" For each item, respondents selected never, occasionally, often, always or don't know.
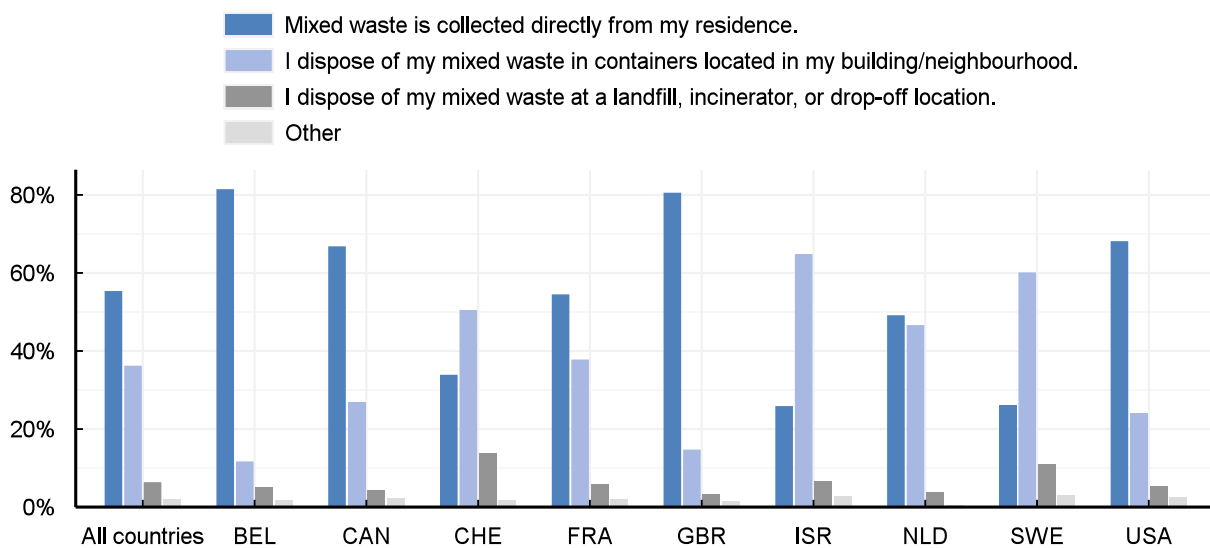Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ᔡᓬ https://stat.link/asej4c

4.3. Waste collection services and charging schemes

4.3.1. Waste and recycling collection services

There is significant variation in the waste collection services available across countries (Figure 4.3). Overall, 55% of households report that mixed waste is collected directly from their residence and 36% of households report that it is collected from containers located in their building or neighbourhood. In Belgium and the United Kingdom, a majority of households (81% in both countries) report that their waste is collected at their place of residence; in Sweden and Israel, only 26% of households report kerbside collection.

Figure 4.3. Collection of mixed waste directly from residences is not systematic across countries

Percentage of households primarily using each disposal method

Note: This survey item asked respondents: "How do you dispose of your mixed (non-recyclable, non-compostable) waste? Please select your primary method of disposal."
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink 🖩📊 https://stat.link/1s6y7i

Across the sample, the vast majority of households report using either services that collect waste from their residence or from drop-off collection sites for most types of recyclable materials (Figure 4.4). The relative use of these services varies by country and the type of material considered, and there are no striking differences in collection services between urban and rural locations. Most households in Belgium, Canada, France and the United Kingdom, for example, report recycling aluminium, tin and steel cans at the kerb, whereas most households in Switzerland, Israel and Sweden report using drop-off centres. Among households that report separating batteries from mixed waste, most dispose of them at drop-off centres. Services for collecting separated food waste appear to be the least provided overall, with an average of 15% of respondents across countries reporting that there are no collection or drop-off services available in their area (reaching 25% and 26% in the United States and Israel, respectively). Overall, a lack of knowledge of the existence of disposal and composting services is highest for food waste and batteries.

Figure 4.4. Food waste and batteries often lack suitable disposal services

Percentage of households primarily using each disposal method

- ■ Door-to-door/kerbside
- ■ Drop off at centre/retailer/store/farmers market
- ■ No service available
- ■ I don't know what collection services exist in my area
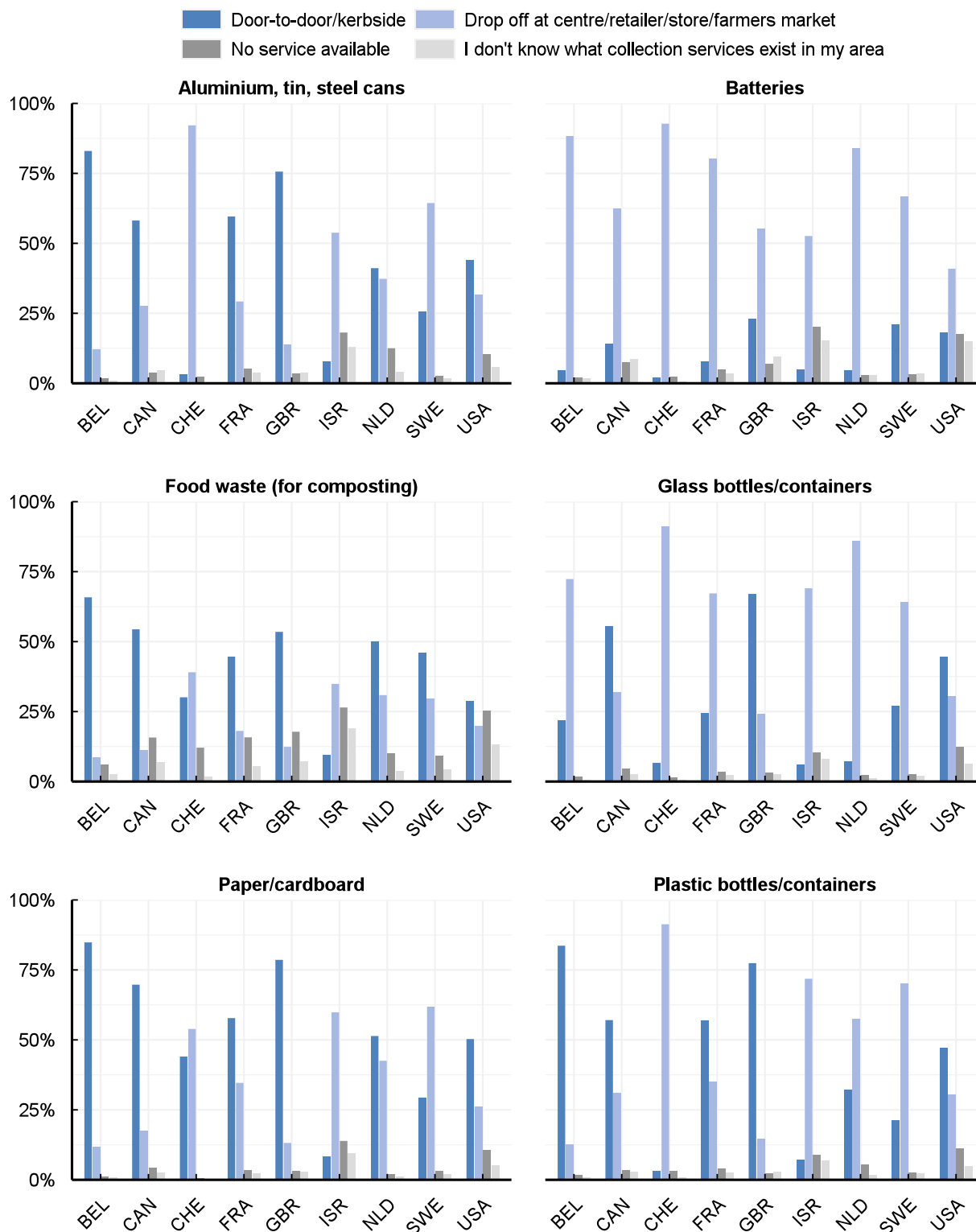
Note: This survey item asked respondents: "What is the main waste collection service you use to dispose of the following?" For each recyclable material, respondents could also indicate that they did not generate that type of waste.
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ⏴⏵ https://stat.link/0riokg

Some changes over time in the coverage of collection services for mixed and recyclable waste are noted in countries participating in both the second (2011) and third (2022) rounds of the EPIC Survey.[7] In France, responses indicate that there has been a modest increase in kerbside collection services for metal, but a decrease in drop-off sites for food waste, paper and cardboard. In the Netherlands, kerbside collection of plastic and other recyclables, and drop-off and kerbside collection services for metals, appear to have become somewhat more widespread as well. In Sweden, survey results suggest that kerbside collection services have become more available for paper and cardboard, glass, plastic, metal and food waste.[8] In Switzerland, the collection of paper and cardboard has shifted away from kerbside collection towards drop-off services. However, considerable proportions of the sample report not knowing what collection services exist, indicating some uncertainty regarding the actual coverage of different types of waste collection services (see Box 4.1 in Section 4.3.2).

The presence of a recycling collection service is associated with less mixed waste being generated per capita (Figure 4.5). Households with kerbside recycling collection generate 42% less mixed waste than households without a collection service. Households that only have drop-off recycling collection services produce 26% less mixed waste than households without a collection service. Households with no reported access to recycling collection services for plastic bottles generate on average 50 litres of mixed waste per capita per week, while those with drop-off services and kerbside collection services available generate 37 and 29 litres, respectively. Results are similar for paper and cardboard recycling collection services.

In addition, households with kerbside collection for plastic packaging recycle 62% of plastic waste, compared to 54% for households that take their plastic waste to a collection site. Similar observations are apparent for glass and plastic bottles, paper and aluminium (Figure 4.6). These results indicate that the provision of collection services for recyclable materials is an important component of policy approaches to reduce mixed waste generation and increase recycling. Overall, these results are in line with findings from the 2011 EPIC Survey, which showed that the availability of door-to-door or drop-off services was associated with approximately 28% to 45% less mixed waste in 8 of the 11 countries surveyed. However, less of a difference was observed in mixed waste generation for kerbside versus drop-off collection services in 2011 compared to 2022 (OECD, 2014[26]).

Figure 4.5. Household engagement in recycling can be improved by making it more convenient

Average mixed waste generated each week (litres per capita)
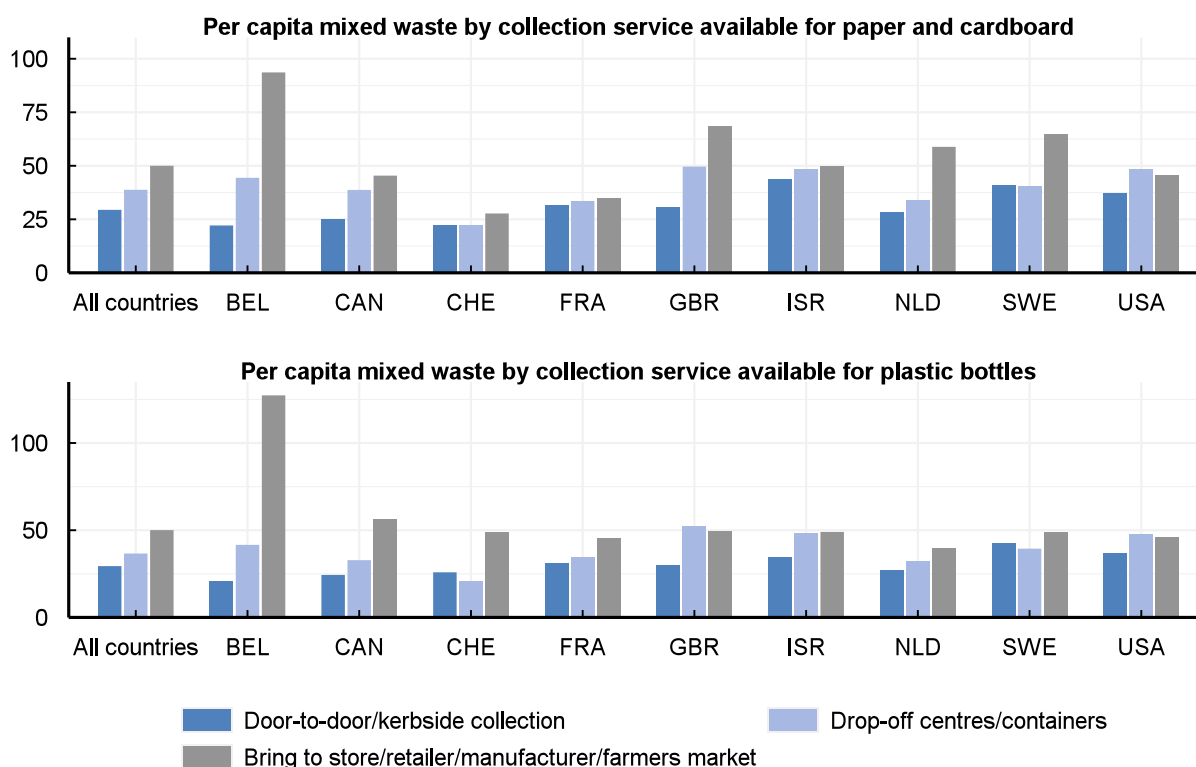
Note: This survey item asked respondents: "On average, how many of the following bags/bins of mixed waste (i.e. non-recyclable and non-compostable waste) does your household generate each week?". The graphs group respondents by their recycling service for paper and cardboard and for plastic bottles. The number of respondents with no recycling service available for paper is as follows: BEL: 6, CAN: 32, CHE: 6, FRA: 28, GBR: 25, ISR: 115, NLD: 15, SWE: 23, USA: 167 The number of respondents with no recycling service available for plastic bottles is as follows: BEL: 12, CAN: 24, CHE: 22, FRA: 30, GBR: 19, ISR: 78, NLD: 48, SWE: 19, USA: 180.
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ⫘⫘⫙ https://stat.link/xq9fro

In addition to their impact on reducing mixed waste, services that collect waste from households' residences appear to be associated with slightly higher recycling rates than services requiring households to return materials to a collection site. Households with kerbside collection for plastic packaging recycle 62% of plastic waste compared to 54% for households that bring their plastic waste to a collection site. Similar observations are apparent for glass and plastic bottles, paper and aluminium (Figure 4.6).

Figure 4.6. Kerbside and door-to-door recycling collection services encourage more recycling

Average percentage of waste separated for recycling or composting

Note: This survey item asked respondents: "Please indicate approximately what percentage of each of the following items your household recycles or composts". Response options were: less than 10%, 25%, 50%, 75%, more than 90%, I don't recycle/compost these items (0%), I don't produce this kind of waste and don't know. The averages displayed in this figure are calculated using the frequency of response types excluding respondents who don't produce this type of waste or responded don't know and assuming values of 5% and 95% for the response categories less than 10% and more than 90%.
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink 🔗 https://stat.link/ig0yu3

4.3.2. Waste charging schemes

A significant proportion of respondents (19%) report not being charged for waste disposal (Figure 4.7). This proportion is highest in Israel (41%), followed by Canada (30%) and the United Kingdom (28%). Across countries, the most common arrangement is a flat fee for waste disposal (37% of households), reaching 54% in France and 53% in the Netherlands. Another 19% of households are charged per unit of waste, with this being most common in Switzerland (52% of households). It should be noted that 13% of respondents across countries report that they do not know what waste charging scheme is in place. For example, if flat fees are incorporated into municipal taxes, respondents may not know how they are charged for mixed waste disposal.

Some changes in waste charging schemes are apparent between 2011 and 2022. Although the use of flat fees appears to have decreased in Israel, results suggest that they have become more prevalent in the Netherlands. Slight increases in the use of per-unit charges are observed in Canada and the Netherlands. In Israel and Sweden, fewer households report being charged in 2022 than in 2011.

Figure 4.7. A flat fee for mixed waste disposal is the most common charge overall

Percentage of respondents indicating their household is subject to different types of charges for mixed waste disposal
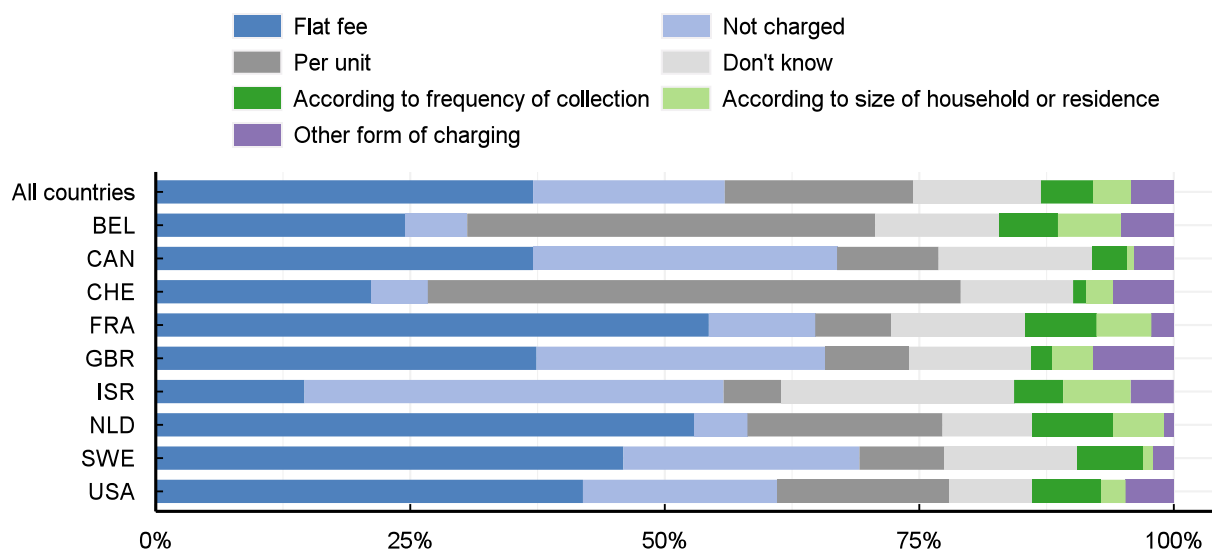
Note: This survey item asked respondents: "How is your household charged for the collection of mixed (non-recyclable, non-compostable) waste at your primary residence? Please select the most relevant option."
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ᔐᔕᔑ https://stat.link/6zi7n9

Charging schemes for mixed waste are designed to reduce mixed waste generation by internalising the costs of waste disposal. The effectiveness of such schemes is likely to depend on a number of factors, such as the level of charges imposed and the characteristics of the communities in which they are implemented. Evidence suggests that the most effective policy strategies may involve a combination of measures aimed at both mixed and recyclable waste, such as combining door-to-door recycling collection services with per-unit charges for the disposal of mixed waste (Montevecchi, 2016[27]; Allers and Hoeben, 2009[28]).

In five out of nine countries in the sample, households that report they are charged a flat fee for waste disposal appear to generate less mixed waste (33 litres) than households that are not charged at all (37 litres) (Figure 4.8). Results for the effect of per-unit charges on waste generation are less conclusive. Per-unit charges require households to pay a fee proportional to the amount of mixed waste they generate. These charges are only associated with lower waste generation in two countries in the sample: the Netherlands (17% less) and Switzerland (24% less). These findings are consistent with other research examining the impact of per-unit charges in the two countries (van Beukering et al., 2009[29]; Pfister and Mathys, 2022[30]). In other countries, however, per-unit charges are associated with greater waste generation. This counter-intuitive result is not conclusive and warrants further analysis to take into account additional factors that may impact waste generation (e.g. household size, residential location, type of unit charge).

At least two considerations are important when interpreting these results. First, it is possible that some respondents may not be fully aware of the collection services and waste charging schemes in their area (Box 4.1). Between 8% of respondents (in the United States) and 23% (in Israel) report not knowing how they are charged for their waste collection. Second, these mixed results do not control for a variety of context-specific variables – such as frequency of collection, income or residential location – which could also affect waste generation. The data suggest the possibility of an inverted U-shaped relationship between income and waste generation in some countries, whereby those in the lowest and highest income quintiles generate less waste per capita than those in the middle-income quintile. Further analysis controlling for additional factors will be necessary to better isolate the impact on waste generation of individual variables such as socioeconomic characteristics, collection service provision or waste charging schemes.

Figure 4.8. The impact of charging schemes on mixed waste generation is unclear

Average per capita mixed waste generated each week (in litres)
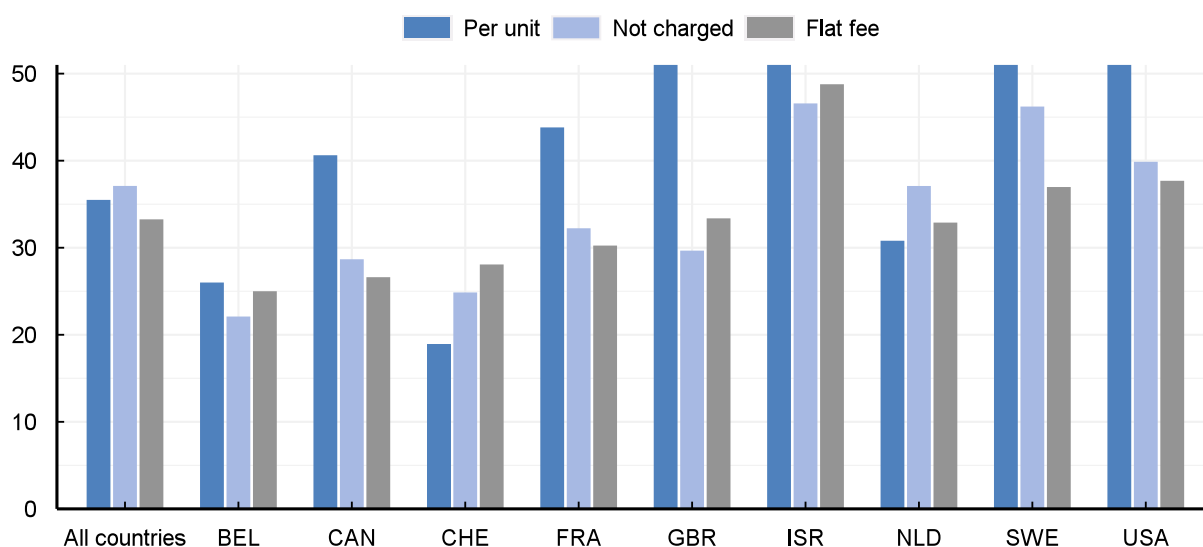
Note: This survey item asked respondents: "On average, how many of the following bags/bins of mixed waste (i.e. non-recyclable and non-compostable waste) does your household generate each week?". The graph groups respondents by their collection charge for mixed waste. The sample sizes for collection charges in each country are the following: BEL Flat fee 225, BEL Not charged 58, CAN Flat fee 334, CAN Not charged 250, CHE Flat fee 194, CHE Not charged 56, FRA Flat fee 483, FRA Not charged 89, GBR Flat fee 343, GBR Not charged 238, ISR Flat fee 128, ISR Not charged 359, NLD Flat fee 474, NLD Not charged 37, SWE Flat fee 397, SWE Not charged 188, USA Flat fee 687, USA Not charged 314.
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ⟋⟍◫ https://stat.link/684qs3

> **Box 4.1. Differences in reported and actual services and charging schemes for mixed and recyclable waste in the survey**
>
> The availability of collection services, charging schemes for mixed waste and incentives for recycling differs across countries included in the sample. There is also considerable variation within countries, as solid waste policies are often implemented at the subnational level. Reported recycling collection service coverage in the EPIC Survey differs in some cases from information on the actual measures that were in place in 2015, as reported by the European Commission (European Commission et al., 2015[31]):[1]
>
> - **In Belgium**, door-to-door collection services for paper were reported by the European Commission to be available to 100% of households in 2015. In the EPIC Survey, 85% of respondents from Belgium reported that this was the case in 2022. In contrast, reported availability of door-to-door collection services for glass appears to align with actual availability, as 20-30% of households in Belgium had such services available in 2015, and 22% report this as being the case in 2022.
> - **In the United Kingdom**, 94% of households were estimated to have access to door-to-door collection services for mixed recyclables (paper, cardboard, plastic and metal) in 2015, but only 67-70% of households report this service for metals, glass and plastic recyclables in the EPIC Survey.
> - **In the Netherlands**, less than 18% of households had door-to-door collection services available for food waste in 2015, while 50% of households surveyed reported them as available in 2022.
> - **In Sweden**, 12% of households were estimated to have collection services available in 2015, while 46% of households report them being available in 2022.
>
> In Belgium and the United Kingdom, this difference may be due to a lack of awareness rather than a decline in service availability, whereas in the Netherlands and Sweden, this difference may reflect in part an increase in service availability between 2015 and 2022.
>
> National statistics on charging scheme coverage at the country level are difficult to find given that waste is managed at various municipal levels by both private and public service providers. There is evidence here of some discrepancy between actual and self-reported coverage of charging schemes in place. In the United Kingdom, for example, 54% of households report some type of charging service (either a flat fee, per-unit charges or some other type) for the disposal of their mixed waste. However, variable charging for mixed waste disposal is prohibited under the 1990 Environmental Protection Act in the United Kingdom. The discrepancy between collection service availability as reported in the EPIC Survey and actual availability could indicate a lack of household awareness regarding the presence and type of charges in place for mixed waste disposal.
>
> 1. This is the most comprehensive recent data available on the coverage of waste services for many of the countries in the sample.

4.4. Household volumes of mixed waste and recycling

Across the nine countries surveyed, households report generating an average of 34 litres of mixed waste and 32 litres of recyclable waste per person per week (Figure 4.9).[9] Respondents in Switzerland report generating the least amounts of both mixed and recyclable waste (22 and 19 litres per person respectively). Respondents in Israel report generating the most mixed waste (48 litres per person), while those in Sweden report recycling the most waste (42 litres per person). Recycling rates, i.e. the percentage of total waste that is recycled, calculated using the reported amounts of mixed and recyclable waste generated, vary between 40% (in Israel) and 53% in the United Kingdom.

Figure 4.9. Average weekly waste generation

Litres per person of mixed waste and recycling, and percent of household waste that is recycled
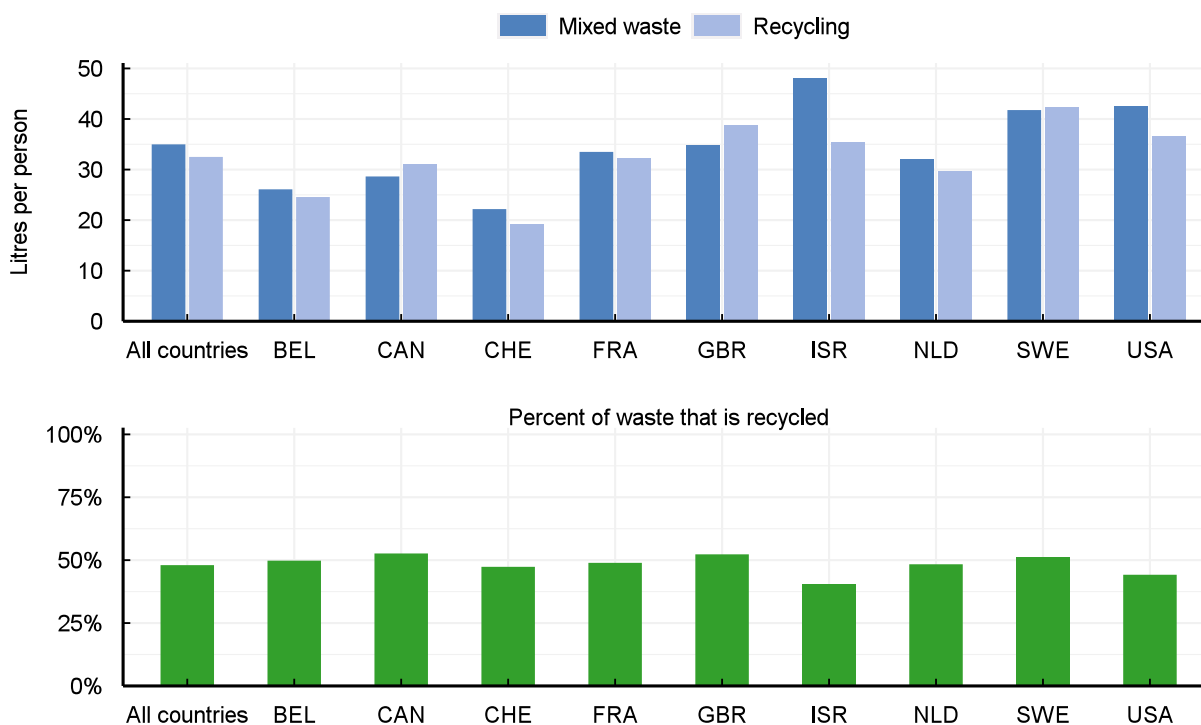
Note: For each respondent the proportion of waste that is separated for recycling is calculated as the household's weekly per capita recycling waste divided by household per capita mixed waste plus household per capita recycling waste. The table reports country averages of this proportion calculated at the household level.
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ᡏᡅᡖᠯ https://stat.link/c1zfki

The most commonly recycled materials across the sample are plastic bottles and containers (62%), and paper and cardboard (61%). Recycling rates for metal and glass are slightly lower (57% and 59%, respectively). An average of 51% of respondents across the sample reports separating batteries from mixed waste (Figure 4.10), while overall 12% of households report that they never separate batteries from mixed waste (highest in the United States, at 27%). In addition to the volume of waste generated per week, respondents were also asked to estimate the percentage of their waste that they separate for recycling or composting (Figure 4.10). Households in Israel and the United States report sorting a lower percentage of their waste than other countries (33% and 43%, respectively). Respondents in the remaining seven countries report sorting an average of 62% of their waste for recycling or composting. In all countries, food waste is sorted least (44% of food waste is separated, ranging from 26% in Israel to 58% in Sweden). It is worth noting that while 27% of the sample reports separating over 90% of their food waste for composting, for 36% of the sample, the share separated is less than 50%. Another 19% of the sample report that they do not separate food waste at all. Section 4.5 presents further results regarding food waste and composting.

Figure 4.10. Plastic and paper/cardboard are separated for recycling most often

Average percentage of waste separated for recycling or composting

Note: This survey item asked respondents: "Please indicate approximately what percentage of each of the following items your household recycles or composts".
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink https://stat.link/cmv32x

All countries in the sample are characterised by a diverse mix of disposal methods for old or broken electronic equipment, with no one method dominating in any country (Figure 4.11).[10] Households report using a specialised disposal or collection service most often, accounting for 22% of total responses. Other common disposal methods are having old equipment taken away by a retailer when new equipment is delivered (13%) and returning old equipment to the retailer (13%). Disposing of electronic equipment along with mixed waste accounted for 9% of the total responses given. This is a significant improvement compared to the 2011 round of the survey, when 34% of respondents reported disposing of electronic equipment with mixed waste. The shares of respondents that report doing so are greatest in Israel, the United States and the United Kingdom, where 16%, 14% and 11% of households respectively report disposing of electronic equipment with mixed waste in 2022.

Figure 4.11. A minority of households dispose of old or broken electronic and electric equipment with mixed waste

Relative proportion of each reason cited
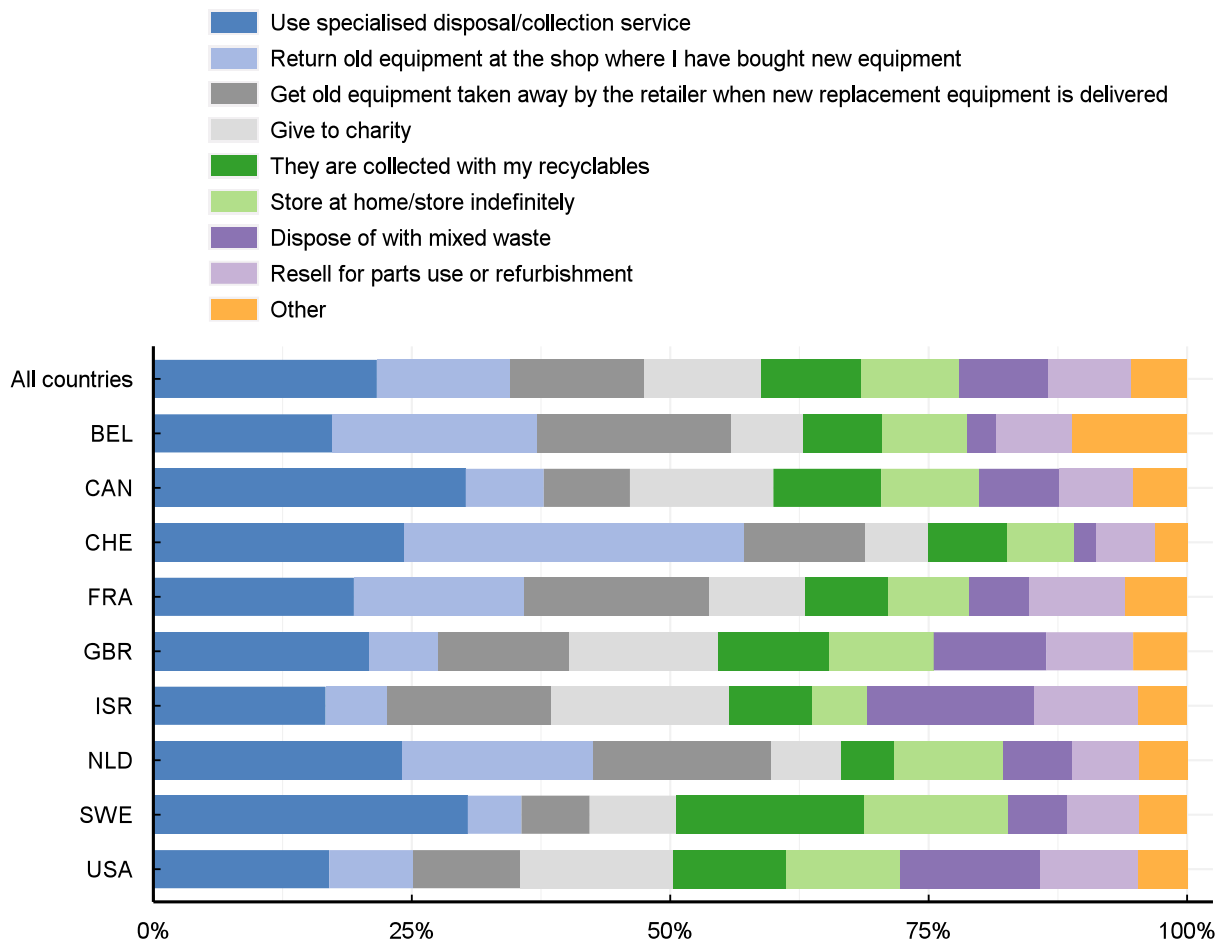
Note: This survey item asked respondents: "In general, how do you dispose of old or broken electronic and electric equipment? Please select all that apply." The values reported reflect the proportion of times that a given reason was cited out of the total number cited.
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ⧉ https://stat.link/dge0qi

Overall, households in the third EPIC Survey report generating less mixed waste than households in the second round of the survey in 2011 (OECD, 2014[26]). In France, for example, average reported weekly household mixed waste generation per capita was approximately 40 litres in 2011, compared to approximately 34 litres in 2022. In Israel, respondents reported generating upwards of 60 litres of mixed waste per capita per week in 2011, compared with 48 litres in 2022. The impact of the COVID-19 pandemic on self-reported waste generation is presented in Box 4.2.

Box 4.2. Implications of Covid-19 for waste behaviours

Evidence indicates that increased time teleworking can lead to both increased as well as decreased rates of waste generation, depending on the amount of teleworking a household engages in (Amicarelli et al., 2022[32]). When asked about changes in the amount of waste generated over the course of the COVID-19 pandemic, households overwhelmingly reported that the amount of mixed and recyclable waste that they generate did not change. This finding is consistent with evidence indicating that although the pandemic decreased plastic use in the short term due to reduced economic activity, it does not appear to have affected the long-term trend of increasing plastic use (OECD, 2022[12]).

Age, residential location and level of environmental concern appear to be associated with high recycling rates, while there is no strong association with education (Figure 4.12). Respondents aged 55 or over report recycling 9% more of their recyclable waste on average than respondents aged 18-34. Respondents who live in rural areas also report recycling a slightly greater share than those in suburban and urban areas. A potential explanation for this result is that urban residents may face greater space constraints for storing recyclable material (Timlett and Williams, 2009[33]). They may also be more likely to live in apartment buildings with diffused responsibility for waste sorting (Slater, 2019[34]). Finally, smaller households also appear to generate more waste and recyclable material per capita (Figure 4.13).[11]

While environmental concern appears to be associated with the choice to sort or not sort household waste, it does not appear to affect the amount of waste that gets separated (Figure 4.12). Households that are highly environmentally concerned are roughly twice as likely to recycle at least some materials, but among households that sort, those that are environmentally concerned report separating 58% of their recyclable waste, while those that are not report separating 51%.

Figure 4.12. Age, a rural location and high environmental concern are associated with greater recycling and composting

Percentage of waste separated for recycling or composting by age, residential location and environmental concern

Note: This survey item asked respondents: "Please indicate approximately what percentage of each of the following items your household recycles or composts". Response options were: less than 10%, 25%, 50%, 75%, more than 90%, I don't recycle/compost these items (0%), I don't produce this kind of waste and don't know. The averages displayed in this figure are calculated using the frequency of response types excluding respondents who don't produce this type of waste or responded don't know and assuming values of 5% and 95% for the response categories less than 10% and more than 90%.
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ⛁ https://stat.link/5m8397

Figure 4.13. Smaller households produce more waste per person on average

Litres per person of mixed waste per week
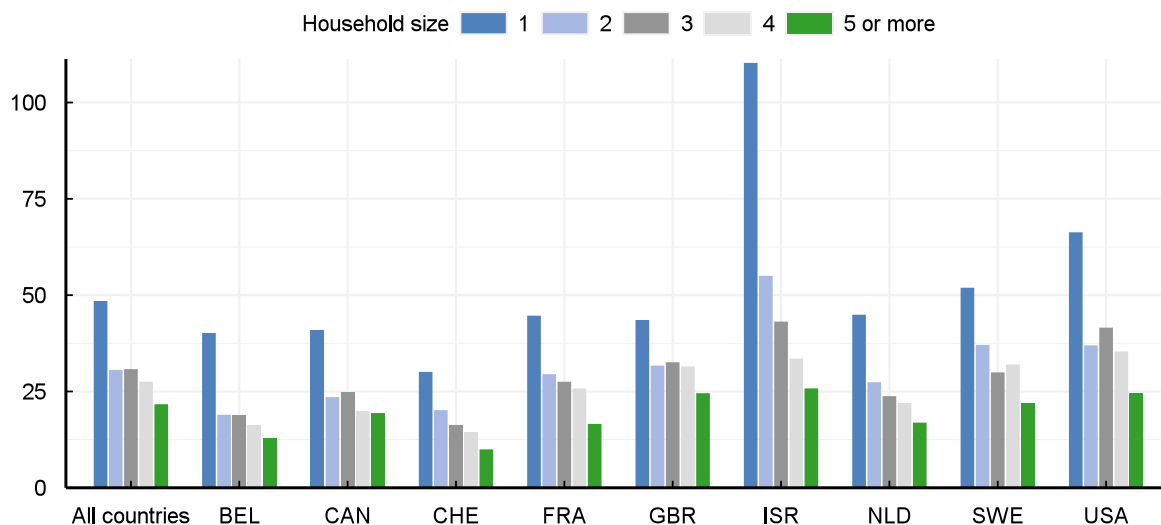
Note: This survey item asked respondents: "On average, how many of the following bags/bins of mixed waste (i.e. non-recyclable and non-compostable waste) does your household generate each week?".
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink https://stat.link/do7jib

4.5. Food waste

4.5.1. Food waste by households

Most respondents in the sample indicate that their household sometimes throws edible food away. The main types of food that households throw away are leftovers from homemade meals, fruit and vegetables, and bread (Figure 4.14). Dairy and eggs, packaged food, and meat and seafood are less frequently thrown away.

Figure 4.14. Leftovers, fruit and vegetables and bread are most likely to be thrown away

Relative proportion of types of food wasted
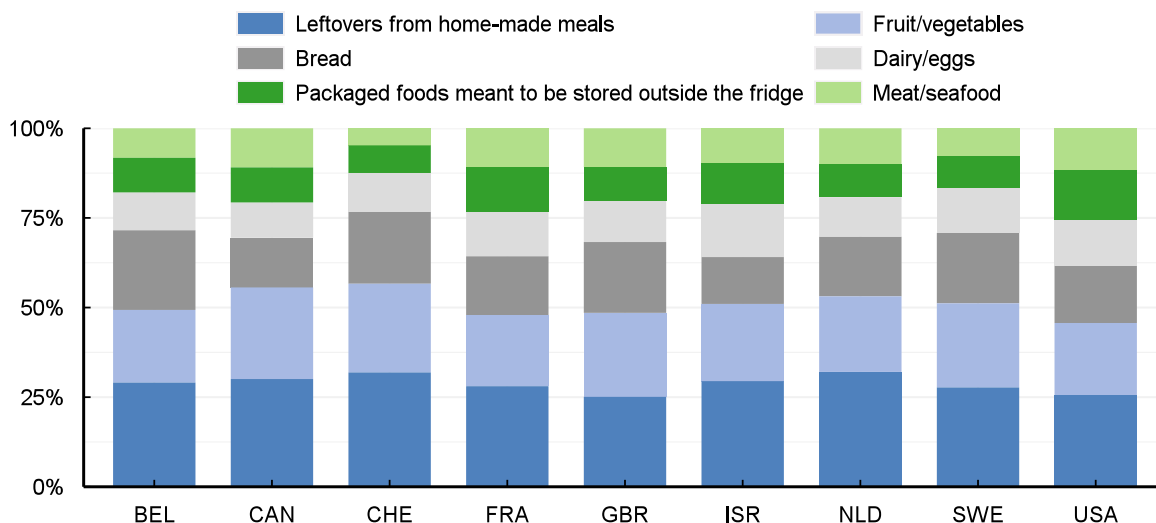
Note: This survey item asked respondents: "What type of food does your household usually throw away? Please exclude non-edible parts of food, e.g. peels or apple cores."
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink https://stat.link/ifj5w3

The main reasons that households give for throwing food away include that the food has spoiled (20% of households), and that it is past the expiry date (16% of households) (Figure 4.15). Households mostly attribute spoilage to having forgotten about the food or buying or cooking too much food. Higher numbers of households in France and Switzerland attribute spoilage to being too busy to prepare it.

Figure 4.15. Most food is thrown away because it is spoiled or past its expiry date

Proportion of respondents often or always throwing away food for specific reasons
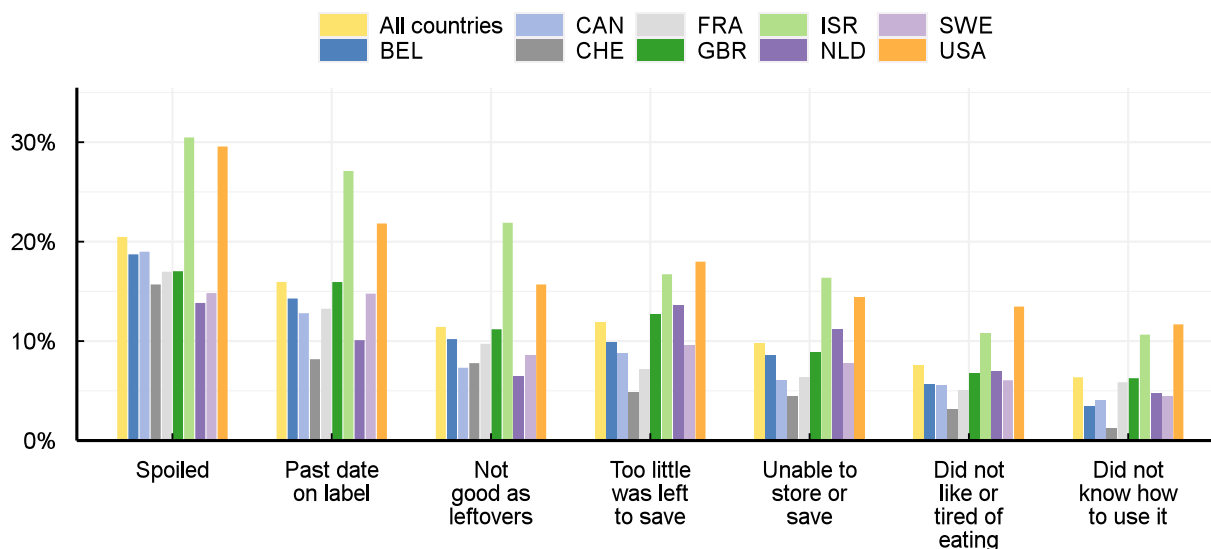
Note: This survey item asked respondents: "How often do you throw away food (e.g., discard it in the trash, garbage disposal, compost, etc.) for the following reasons?" This question was asked of households that indicated that they throw food away. The sample sizes in each country are the following: BEL: 506, CAN: 533, CHE: 444, FRA: 395, GBR: 570, ISR: 734, NLD: 565, SWE: 553, USA: 1144.
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink 🔗 https://stat.link/yacu5e

In addition to reducing the amount of food that is disposed of with mixed waste, environmental policies also aim to reduce the amount of food that becomes spoiled and is thrown away. The highest proportions of households reporting that they waste food (i.e. dispose of edible or spoiled food with mixed waste) are in Sweden, the United States and Israel. Wasting food is associated with several socio-economic characteristics (Figure 4.16). The presence of children in the household, for example, significantly increases the likelihood of throwing food away. Whereas 58% of households without children report wasting food, 79% of households with children report doing so. Across countries, 57% of households in rural areas waste food compared to 71% of households in urban areas. There also appears to be an association with the number of adults in a household. In most countries in the sample, households of five adults or more and high-income households are most likely to waste food, a finding confirmed by other research (Everitt et al., 2022[35]; Hermanussen, Loy and Egamberdiev, 2022[36]). In most countries, those in rural areas are more likely to report that they never throw away food than those in urban areas.

Figure 4.16. Households that are smaller, with older members, in rural areas and without children are less likely to throw away food

Percentage of households wasting at least some food
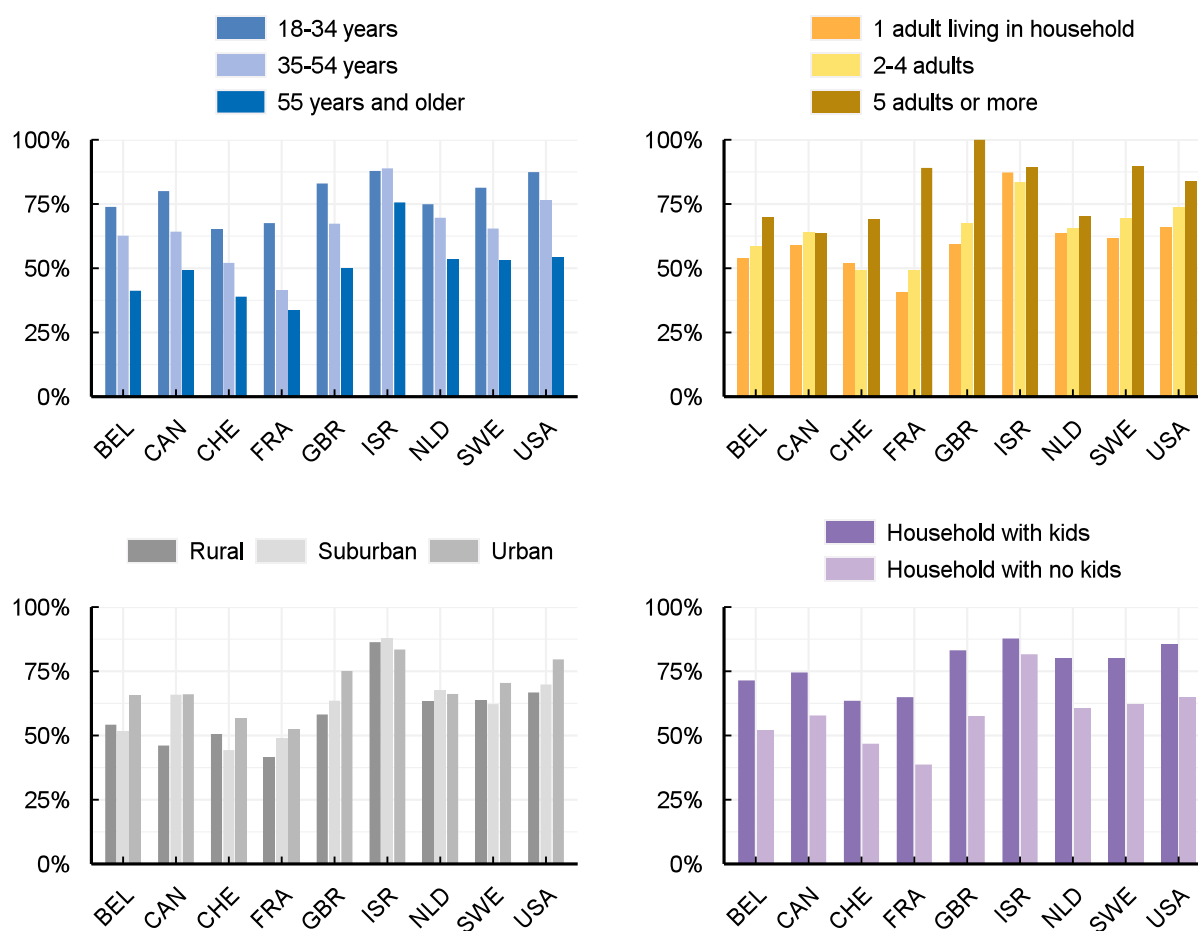
Note: This survey item asked respondents: "What type of food does your household usually throw away? Please exclude non-edible parts of food, e.g. peels or apple cores." The figure shows the percentage of respondents who did not respond: "My household never throws away any food".
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ⧉⧉⧉ https://stat.link/f19asn

Additionally, the reasons given for wasting food vary by the type of household: households with children are more likely to report that food has spoiled because they made too much (Figure 4.17). Households with children face challenges in portion planning and time management. This points to the potential role of information on shopping portions and meal planning. Wealthier households are also more likely to report that they waste food. The main reasons these households cite for wasting food is that it spoiled or was past the date on its label.

Households indicate that several different types of information would be helpful in enabling them to reduce the amount of food that they throw away. Information on what can be frozen and for how long was cited by the greatest proportion of households. Shopping or portion plans, information on how to store food and information on what foods are dangerous when spoiled (rather than simply unappealing) were also highlighted as useful.

Figure 4.17. Higher-income households and those with children are more likely to waste edible food

Percentage of household often or always wasting edible food
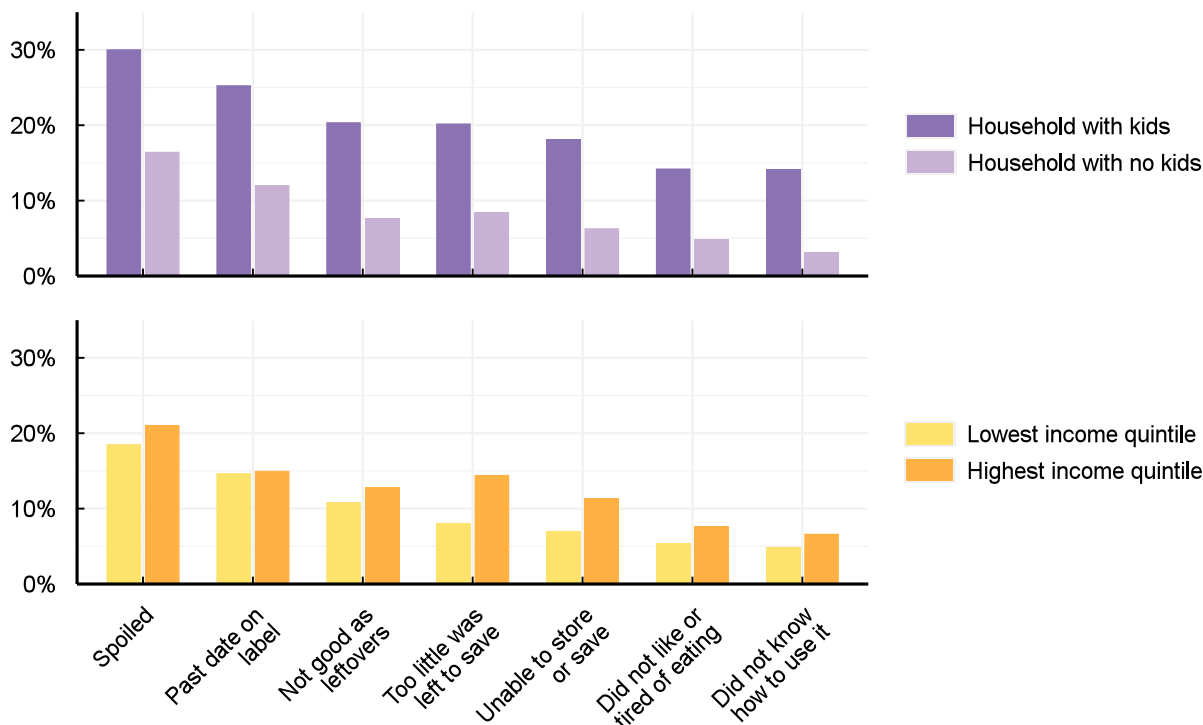
Note: This survey item asked respondents: "How often do you throw away food (e.g. discard it in the trash, garbage disposal, compost, etc.) for the following reasons?". For each reason respondents could select never, rarely, sometimes often or always. The question was asked of respondents who throw away any type of food. Sample sizes are the following: BEL: 506, CAN: 533, CHE: 444, FRA: 395, GBR: 570, ISR: 734, NLD: 565, SWE: 553, USA: 1144.
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink 🖳 https://stat.link/b8e6d4

4.5.2. Composting of food waste

Households report separating an average of 44% of their food waste for composting, ranging from 26% in Israel to 58% in Sweden (refer back to Figure 4.10). Composting here refers to the production of compost from vegetable matter, either at home or at a collective facility. While some households have a high level of engagement, others do not engage in composting at all. While 27% report separating over 90% of their food waste for composting, 36% report separating less than 50%, and 19% report not separating food waste at all. Of households separating their food waste for composting, 53% across countries compost at home while the remainder dispose of separated food waste in a collection facility.

Wealthier and more environmentally concerned households compost the most. The average percentage of food waste composted (rather than disposed of with mixed waste) is 46% for those with high environmental concern and 40% for those with low environmental concern (refer back to Figure 4.12). On average, high-income households compost 48% of their food waste, compared with 40% for low-income households. Exceptions are France, the United Kingdom and Israel, where there appears to be no strong relationship between reported income and the percent of food waste that is composted. This could reflect the influence of a number of factors, including the availability of collection services.

The availability of collection services is an important determinant of composting behaviour. Younger respondents and those living in detached houses consider unpleasantness and a lack of knowledge on the topic as more significant barriers to composting than a lack of space. Those living in apartments or

semi-detached houses, however, report that a lack of space is the most significant barrier. Households with children indicate a lack of knowledge, unpleasantness and the amount of organisation as the most significant barriers. Lack of knowledge on the subject figured among the top reasons for respondents in Israel and the United States.

The survey further suggests that the type of collection charge imposed for mixed waste may have an impact on the amount of food waste that is separated for composting. For example, households being charged a per-unit fee for mixed waste on average report separating 55% of their food waste for composting, while those that are not charged report separating 35% of their food waste.

Respondents across the sample consistently cite greater financial incentives (i.e. either saving or receiving more money), and having compostable waste collected kerbside, as the top measures that would encourage them to recycle or compost more. More accessible collection or drop-off services are also cited as a top factor in most countries in the sample. Simpler requirements for recycling and composting figured among the top three reasons in Canada and the United Kingdom; having more space available at home was cited as a top reason in Sweden.

These factors are similar across income levels, age and residential locations. Although the top reasons cited by those with high and low levels of environmental concern do not differ, those with low environmental concern cite greater financial incentives relatively more often than those with high environmental concern (Figure 4.18). Even households that report having no access to recycling collection services are more likely to report that greater financial incentives rather than the provision of collection services would encourage them to recycle more.[12] This is consistent with existing evidence that shows that the presence of a deposit-refund system increases plastic recycling rates (Colelli et al., 2022[37]; Laubinger et al., 2022[38]). If the charging schemes that households report being in place in the survey are deposit-refund systems,[13] these findings could indicate that there may be scope to increase the refund rates of these systems in order to more effectively incentivise households to sort their recyclable waste.[14]

Figure 4.18. Financial incentives to recycle/compost are more motivating to those with lower environmental concern

Percentage of respondents ranking a measure as the most important
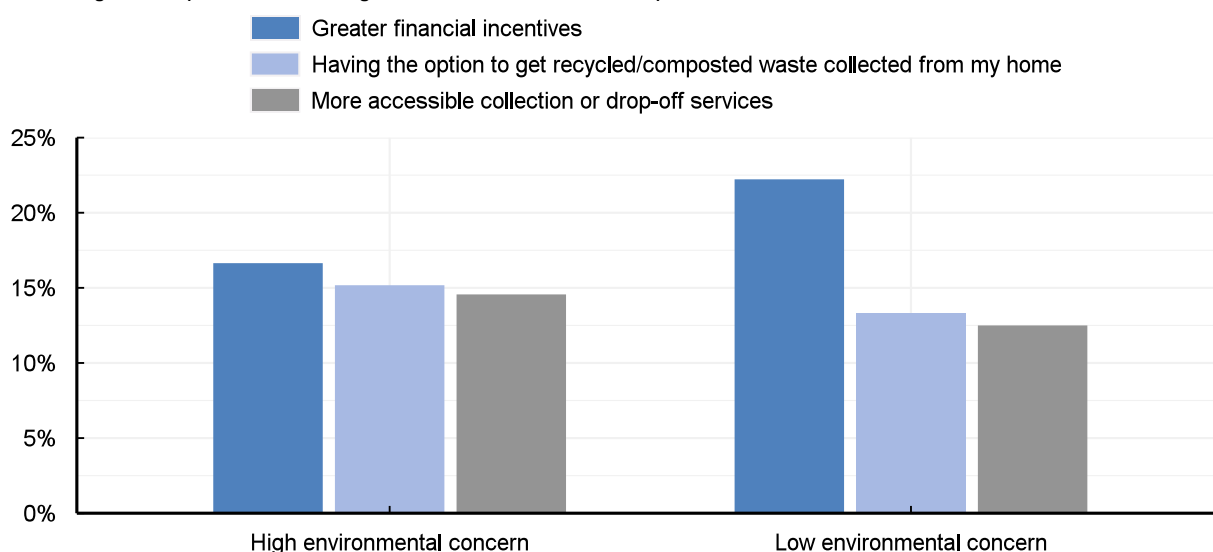
Note: This survey item asked respondents: "Please rank up to three most important factors from 1 (most important) to 3 (third most important) that would encourage your household to recycle or compost more". Nine possible reasons were provided. The three most frequently chosen measures per group are displayed.
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ⬛ https://stat.link/3uh9je

References

Allers, M. and C. Hoeben (2009), *Effects of Unit-Based Garbage Pricing: A Differences-in-Differences Approach*, Springer Science and Business Media LLC, https://doi.org/10.1007/s10640-009-9320-6. [28]

Amicarelli, V. et al. (2022), *Has the COVID-19 pandemic changed food waste perception and behavior? Evidence from Italian consumers*, Pergamon, https://doi.org/10.1016/J.SEPS.2021.101095. [32]

CISL (2022), *Green Circularity: Advancing the EU's Climate Goals through a Circular Economy*, The University of Cambridge Institute for Sustainability Leadership, https://www.corporateleadersgroup.com/files/green_circularity_advancing_the_eus_climate_goals_through_a_circular_economy1.pdf (accessed on 8 March 2023). [21]

Colelli, F. et al. (2022), *Assessment of the effectiveness and efficiency of packaging waste EPR schemes in Europe*, Pergamon, https://doi.org/10.1016/J.WASMAN.2022.05.019. [37]

Diaz-Farina, E., J. Díaz-Hernández and N. Padrón-Fumero (2020), *The contribution of tourism to municipal solid waste generation: A mixed demand-supply approach on the island of Tenerife*, Elsevier BV, https://doi.org/10.1016/j.wasman.2019.11.023. [2]

Dou, Z. and J. Toth (2021), *Global primary data on consumer food waste: Rate and characteristics – A review*, Elsevier BV, https://doi.org/10.1016/j.resconrec.2020.105332. [15]

EPA (2023), "2019 Wasted Food Report: Estimates of generation and management of wasted food in the United States in 2019". [19]

European Commission, D. et al. (2015), "Assessment of separate collection schemes in the 28 capitals of the EU - Publications Office of the EU", https://data.europa.eu/doi/10.2779/49194 (accessed on 17 February 2023). [31]

Everitt, H. et al. (2022), *The quantity and composition of household food waste during the COVID-19 pandemic: A direct measurement study in Canada*, Elsevier, https://doi.org/10.1016/J.SEPS.2021.101110. [35]

Grimmer, M. and M. Woolley (2014), *Green marketing messages and consumers' purchase intentions: Promoting personal versus environmental benefits*, Routledge, https://doi.org/10.1080/13527266.2012.684065. [25]

Heo, J. and S. Muralidharan (2017), "What triggers young Millennials to purchase eco-friendly products?: The interrelationships among knowledge, perceived consumer effectiveness, and environmental concern", *Journal of Marketing Communications*, Vol. 25/4, pp. 421-437, https://doi.org/10.1080/13527266.2017.1303623. [24]

Hermanussen, H., J. Loy and B. Egamberdiev (2022), *Determinants of food waste from household food consumption: A case study from field survey in Germany*, Multidisciplinary Digital Publishing Institute, https://doi.org/10.3390/IJERPH192114253. [36]

IPCC (2022), *Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, https://doi.org/10.1017/9781009157926. [17]

Karri, R., G. Ravindran and M. Dehghani (eds.) (2021), *Soft Computing Techniques in Solid Waste and Wastewater Management*, Elsevier, https://doi.org/10.1016/c2020-0-01696-8.

[3]

Kaza, S. et al. (2018), *What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050*, Washington, DC: World Bank, https://doi.org/10.1596/978-1-4648-1329-0.

[10]

Khatiwada, D. et al. (2021), "Circularity in the Management of Municipal Solid Waste – A Systematic Review", *Environmental and Climate Technologies*, Vol. 25/1, pp. 491-507, https://doi.org/10.2478/rtuect-2021-0036.

[13]

Laubinger, F. et al. (2022), *Deposit-refund systems and the interplay with additional mandatory extended producer responsibility policies*, OECD Publishing, Paris, https://doi.org/10.1787/a80f4b26-en.

[38]

Magazzino, C., M. Mele and N. Schneider (2020), *The relationship between municipal solid waste and greenhouse gas emissions: Evidence from Switzerland*, Elsevier BV, https://doi.org/10.1016/j.wasman.2020.05.033.

[40]

Material Economics (2018), *The Circular Economy: A Powerful Force for Climate Mitigation - Material Economics*, https://materialeconomics.com/publications/the-circular-economy-a-powerful-force-for-climate-mitigation-1 (accessed on 8 March 2023).

[22]

Montevecchi, F. (2016), *Policy mixes to achieve absolute decoupling: A case study of municipal waste management*, Multidisciplinary Digital Publishing Institute, https://doi.org/10.3390/SU8050442.

[27]

OECD (2022), *Data warehouse*, https://doi.org/10.1787/data-00900-en (accessed on 21 July 2022).

[11]

OECD (2022), *Global Plastics Outlook: Economic Drivers, Environmental Impacts and Policy Options*, OECD Publishing, Paris, https://doi.org/10.1787/de747aef-en.

[12]

OECD (2022), *The Economics of the Transition to a More Resource-Efficient Circular Economy: The OECD RE-CIRCLE project*, OECD Publishing, Paris, https://www.oecd.org/env/waste/Policy-Perspectives-The-economics-of-the-transition-to-a-more-resource-efficient-circular-economy.pdf.

[8]

OECD (2021), *Towards a More Resource-Efficient and Circular Economy: The Role of the G20*, OECD Publishing, http://www.oecd.org/environment/waste/OECD-G20-Towards-a-more-Resource-Efficient-and-Circular-Economy.pdf (accessed on 8 March 2023).

[23]

OECD (2019), *Global Material Resources Outlook to 2060: Economic Drivers and Environmental Consequences*, OECD Publishing, Paris, https://doi.org/10.1787/9789264307452-en.

[1]

OECD (2015), *Deposit-refund systems: Design and implementation*, OECD Publishing, Paris, https://doi.org/10.1787/9789264244542-7-en (accessed on 3 October 2022).

[39]

OECD (2014), *Greening household behaviour: Overview from the 2011 survey - revised edition*, OECD Publishing, Paris, https://doi.org/10.1787/9789264214651-en.

[26]

OECD (2008), *Recommendation of the Council on Resource Productivity, OECD/LEGAL/0358*, OECD, https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0358 (accessed on 30 June 2022).

[6]

Periathamby, A. (2011), *Municipal Waste Management*, Elsevier, https://doi.org/10.1016/b978-0-12-381475-3.10008-7. [9]

Pfister, N. and N. Mathys (2022), *Waste taxes at work: Evidence from the canton of Vaud in Switzerland*, Elsevier BV, https://doi.org/10.1016/j.ecolecon.2021.107314. [30]

Siddiqua, A., J. Hahladakis and W. Al-Attiya (2022), *An overview of the environmental pollution and health effects associated with waste landfilling and open dumping*, Springer Science and Business Media LLC, https://doi.org/10.1007/s11356-022-21578-z. [14]

Slater, D. (2019), *Houses of Multiple Occupation (HMOs): Barriers to Improving Recycling*, https://wrap.org.uk/resources/report/houses-multiple-occupation-hmos-barriers-improving-recycling (accessed on 31 January 2023). [34]

Stenmarck, A. et al. (2016), *Estimates of European Food Waste Levels. Fusions: Reducing Food Waste Through Social Innovation*, IVL Swedish Environmental Research Institute, http://eu-fusions.org/phocadownload/Publications/Estimates%20of%20European%20food%20waste%20levels.pdf. [18]

Timlett, R. and I. Williams (2009), "The impact of transient populations on recycling behaviour in a densely populated urban environment", *Resources, Conservation and Recycling*, Vol. 53/9, pp. 498-506, https://doi.org/10.1016/j.resconrec.2009.03.010. [33]

UN (2015), *UN Sustainable Development Goals*, UN, https://sdgs.un.org/goals (accessed on 30 June 2022). [7]

UN (1992), *Report of the United Nations Conference on Environment and Development*, United Nations, https://digitallibrary.un.org/record/168679?ln=en (accessed on 30 June 2022). [5]

UNEP (2022), *Draft resolution: End plastic pollution: Towards an international legally binding instrument, UNEP/EA.5/L.23/Rev1*, UNEP, https://wedocs.unep.org/handle/20.500.11822/38525. [4]

UNEP (2021), *Food Waste Index Report 2021*, https://www.unep.org/resources/report/unep-food-waste-index-report-2021. [16]

van Beukering, P. et al. (2009), *Effectiveness of unit-based pricing of waste in the Netherlands: Applying a general equilibrium model*, Elsevier BV, https://doi.org/10.1016/j.wasman.2009.07.002. [29]

Wei, T. (ed.) (2020), "Consumers discard a lot more food than widely believed: Estimates of global food waste using an energy gap approach and affluence elasticity of food waste", *PLOS ONE*, Vol. 15/2, p. e0228369, https://doi.org/10.1371/journal.pone.0228369. [20]

Notes

[1] In this estimate, municipal solid waste includes residential, commercial, and institutional waste.

[2] See e.g. Magazzino, Mele and Schneider (2020[40]) for a review of the literature.

[3] The definition of municipal waste in this calculation includes household waste and similar waste originating from households, commerce and trade, small businesses, office buildings and institutions (schools, hospitals, government buildings), as well as selected municipal services (e.g. waste from park and garden maintenance and street cleaning services if managed as waste).

[4] The remaining 12% were microplastics, i.e. polymers with a diameter smaller than 5mm coming from sources such as tyre abrasion, brake wear and textile washing (OECD, 2022[12]).

[5] Examples of labelling schemes include the Nordic Swan Ecolabel (Denmark, Finland, Iceland, Norway, Sweden), Blauer Engel (Germany), the EU Ecolabel, and the EU Energy Label, as well as EPEAT (United States).

[6] See Annex B on the design and implementation of the EPIC survey and on the quality of the panel of respondents.

[7] Differences in sample representativeness and survey item formulations across rounds prevents making direct comparisons of quantitative results. However, large differences in results across surveys can indicate possible broad trends over time.

[8] For paper, cardboard, glass, plastic and metal, collection services apply to packaging rather than all materials.

[9] Waste generation was measured in volume. As such, differences in weight (e.g. induced by volume-based charging schemes) are not reflected in the results presented. Volume is nevertheless a useful indicator of waste generation, as it is easier for households to estimate.

[10] When identifying how they dispose of old or broken electronic equipment, households were able to list multiple disposal methods.

[11] Single-person households in Israel report particularly high levels of waste generation, for reasons which are unclear. Israel has the smallest number of single-person households, a number of whom report very high levels of waste generation. These respondents almost exclusively report incomes in quintiles 1-3 and have a higher average age than the general sample from the rest of the country.

[12] Although respondents report that financial incentives would be effective in encouraging them to recycle more, this does not necessarily mean that they would prefer financial incentives over other measures, such as the provision of collection services. A reliance on financial incentives, e.g. a deposit-refund scheme, alone may also raise equity concerns in the presence of unequal access to return sites. In this case, unequal access to deposit sites would lead to an unequal ability to participate in the program and access its benefits. The provision of kerbside collection services, in contrast, can facilitate more widespread access to recycling insofar as it eliminates the need for the means and time to travel to a return site.

[13] Deposit-refund schemes were not addressed in the EPIC Survey.

[14] The feasibility of deposit-refund systems, for example, relies on selecting material coverage, deposit level and collection mechanisms that yield return rates that enable the system to be cost-effective (OECD, 2015[39]).

5 Household behaviour and food consumption

Food systems emit around one third of global anthropogenic greenhouse gases (GHGs), with livestock production accounting for 32% of all agricultural emissions. This chapter summarises responses to questions on food consumption in the third round of the OECD Survey on Environmental Policies and Individual Behaviour Change (EPIC). The chapter analyses the data on households' food consumption behaviour across the nine countries surveyed, including their frequency of consuming seasonal and organic food, whether households source locally, the frequency with which they consume rad meat and their willingness to consume meat alternatives, and their priorities when purchasing food. It also explores respondents' support for various public policies to promote the sustainability of food systems.

Key findings

- **Affordability, freshness, taste and nutritional value, rather than environmental considerations, are priorities when making food purchases.** Compared with affordability, freshness, taste and nutritional value, a product's carbon footprint and the amount of pesticides used in its production are reported to be less important, even among environmentally concerned respondents. This suggests that appeals to concern for the environment alone will not be sufficient to influence consumers towards sustainable food choices. Complementary attention to the affordability, taste, and health benefits of food items will be needed to influence purchasing behaviour.

- **Meat is widely consumed and a shift to more sustainable alternatives has the potential to yield large-scale environmental benefits.** Overall, 24% of respondents report eating meat several times a week. There is a consistent association between higher incomes and more frequent consumption of animal products, especially for red meat and seafood. Income appears to have more of a correlation with red meat consumption than with environmental concern.

- **Campaigns encouraging consumers to shift their diet towards more sustainable alternatives should be complemented by efforts to correct misperceptions about safety, cost and nutritional value.** Only 28% of respondents, ranging from 20% in France and 41% in Israel, indicate a willingness to substitute red meat for a lab-grown alternative, while 44% indicate that they would not be willing to do so. Respondents cite reservations about potential health impacts, presumed inferior taste and nutritional value, high cost and incompatibility with their culture or values.

- **High levels of support for many food-system policies suggest that households may be relatively receptive towards policies that aim to induce shifts to more sustainable diets.** Support is highest for policies aiming to educate people about sustainable diets (78% of respondents), to regulate the use of pesticides (71%), and to provide farmers with incentives to adopt sustainable agricultural practices (74%). Support for policies involving a tax on meat or seafood was much lower, with 26% of respondents strongly disagreeing.

5.1. Introduction

Food systems encompass the activities involved in the production, processing, distribution and consumption of food. These systems face a triple challenge: providing food security to a growing population; improving environmental sustainability; and providing for farmers and those whose livelihoods depend on the food supply chain (OECD, 2021[1]). The growing importance of the agriculture, forestry and fishing sectors is signalled by their contribution to the global economy, which increased from USD 0.9 trillion in 1970 to USD 3.6 trillion in 2020 (World Bank and OECD, 2022[2]). Growth in both population and per capita income are expected to increase global demand for food by 1.4% per year over the next decade (OECD/FAO, 2022[3]). To satisfy projected demand by 2050, total calories from agricultural production must increase by 35% to 56% compared to 2010 (van Dijk et al., 2021[4]). Food security faces further challenges from a potential scarcity of arable land and water, and a growing demand for under-priced and resource-intensive food products, such as meat and dairy (Godfray et al., 2018[5]). The pressures that food systems face from changes in demand are exacerbated by environmental degradation, competing land uses and climate change.

Farmed land occupies about 40% of Earth's terrestrial surface and accounts for around 70% of global freshwater use (Poore and Nemecek, 2018[6]; Foley et al., 2011[7]; IPCC, 2019[8]). Food systems emit around one third of global anthropogenic greenhouse gases (GHGs), while agriculture alone accounts for 17% (FAO, 2021[9]; Poore and Nemecek, 2018[6]; Crippa et al., 2021[10]; IPCC, 2019[8]). Livestock production accounts for 32% of total emissions from agriculture, while cultivation accounts for 37% and land-use change 31%. In addition to contributing to climate change by releasing large amounts of stored carbon from vegetation and soils, conversion of forest to farmland also drives global biodiversity loss (Searchinger et al., 2018[11]).

Intensifying agriculture can increase yields and thereby reduce demand for cultivated land. However, the high levels of fertiliser and pesticides required by intensive food production can enter the environment at levels that often exceed environmental standards, posing a risk to ecosystem health and biodiversity (Pimentel and Burgess, 2014[12]). Lifecycle analyses estimate that pollution from food systems, mostly from the use of nitrogen fertiliser, is responsible for 32% of terrestrial acidification (i.e. deposition of sulphur or nitrogen in the soil causing changes in its chemical properties) and 78% of eutrophication (a similar process in freshwater bodies) (OECD, 2018[13]). In the long run, these externalities could threaten productive food systems, which depend on well-functioning ecosystems.

All food production systems are dependent upon, but also impact, the environment to a greater or lesser extent. As global food demand increases, there is a commensurate need for targeted policy action to increase both the sustainability and efficiency of food production systems in order to minimise their overall environmental impact. Supply-side measures, such as environmental standards, can play an important role in driving production changes that reduce the negative environmental impacts of food production (IPCC, 2022[14]). For example, beef sourced from the dairy sector results in emissions 60% lower than those from dedicated beef herds (Poore and Nemecek, 2018[6]).

Protein derived from any farmed animal, however, affects the environment far more than the nutritionally equivalent plant protein, regardless of production method. Based on GHG emissions, eutrophication and acidification, plant-based protein sources (beans, peas, nuts and tofu) have the lowest average environmental impact. Even when comparing the least impactful producers of animal protein, emissions from meat, dairy, aquaculture and eggs still exceed the average emissions from plant-based proteins (Poore and Nemecek, 2018[6]). Taken together, animal products use 83% of farmland and contribute 56-58% of emissions from food while providing only 37% of protein and 18% of calories produced globally (Poore and Nemecek, 2018[6]).

A shift to organic food production can mitigate the impacts of synthetic fertilisers and pesticides on ecosystem health, biodiversity loss and fossil fuel use and support long-term soil health through crop

rotation and inter-cropping practices. However, organic farming requires more land than intensive farming and GHG emissions are similar across both production methods (Clark and Tilman, 2017[15]). Food miles do not necessarily determine a product's net environmental impact, especially for animal products, as some studies show that importing vegetables from regions in which they are in season results in far fewer emissions than producing them locally during winter months (Hospido et al., 2009[16]). Evidence for the environmental impact of ultra-processed foods is limited. However, many of these food products contain palm and soy oils, which have substantial negative effects on the environment and biodiversity (Seferidi et al., 2020[17]).

Measures that succeed in shifting diets away from resource-intensive products can deliver environmental benefits beyond those that can be achieved by improving production methods alone (Poore and Nemecek, 2018[6]; OECD, 2021[1]). This is especially true in developed countries where demand for animal protein is high. The mitigation potential of a shift to plant-based diets is estimated at 0.7–8 gigatonnes of carbon dioxide equivalent (GtCO$_2$eq) per year by 2050.[1] Dietary shifts could also reduce agricultural land use by 3.1 billion hectares, which in turn reduces land degradation and desertification (IPCC, 2019[8]; IPCC, 2022[14]). More environmentally friendly diets also deliver significant co-benefits for public health and food security (Searchinger et al., 2018[11]; IPCC, 2019[8]). Estimates suggest that a switch to diets with fewer animal-sourced foods could reduce global mortality by 6-10% (Springmann et al., 2016[18]). Plant-based alternatives and lab-grown meat can be produced in less resource-intensive ways with a considerably smaller carbon footprint than conventionally-raised meat (Frezal, Nenert and Gay, 2022[19]; Treich, 2021[20]). Existing public health policies, such as food labelling, that have proven successful in shifting consumption choices can offer a valuable basis for policy design (Giner and Brooks, 2019[21]; Temme et al., 2020[22]).

This chapter gives an overview of the data gathered in the third round of the OECD Survey on Environmental Policy and Individual Behaviour Change (EPIC) on a variety of household decisions related to food systems.[2] It explores in particular households':

- dietary habits and willingness to try lab-grown meat
- food priorities and shopping habits
- purchases of seasonal, locally sourced and organic food
- changes in food consumption behaviour following the COVID-19 pandemic
- support for food system policies.

For each of these areas, the chapter uses representative country samples to analyse differences in respondents' behaviours and attitudes across relevant variables such as income level, residence type and location, ownership status and level of environmental concern.

5.2. Household dietary habits

The survey shows that dairy products are consumed the most frequently (Figure 5.1), with an average of 69% of households eating them several times a week (ranging from 60% in Belgium to 76% in Sweden). On average, 65% of households report eating meat at least once per week (ranging from 56% in Switzerland and the Netherlands to 76% in the United States). Of these, 41% of households eat red meat once a week (ranging from 36% in Sweden to 48% in Canada), and 24% eat it several times a week (ranging from 18% in the Netherlands and 34% in the United States). Consumption of white meat is more frequent but also more variable across countries (from 23% in Switzerland to 47% in the United Kingdom reporting eating it several times a week), while seafood is generally consumed less frequently and with even greater variability (from 3% in Switzerland to 15% in the United Kingdom eating it more than once a week). Interestingly, across all countries, those reporting lower consumption of red or white meat also report consuming less dairy.

Figure 5.1. Dairy products are the most frequently consumed animal products, followed by white meat

Percentage of respondents
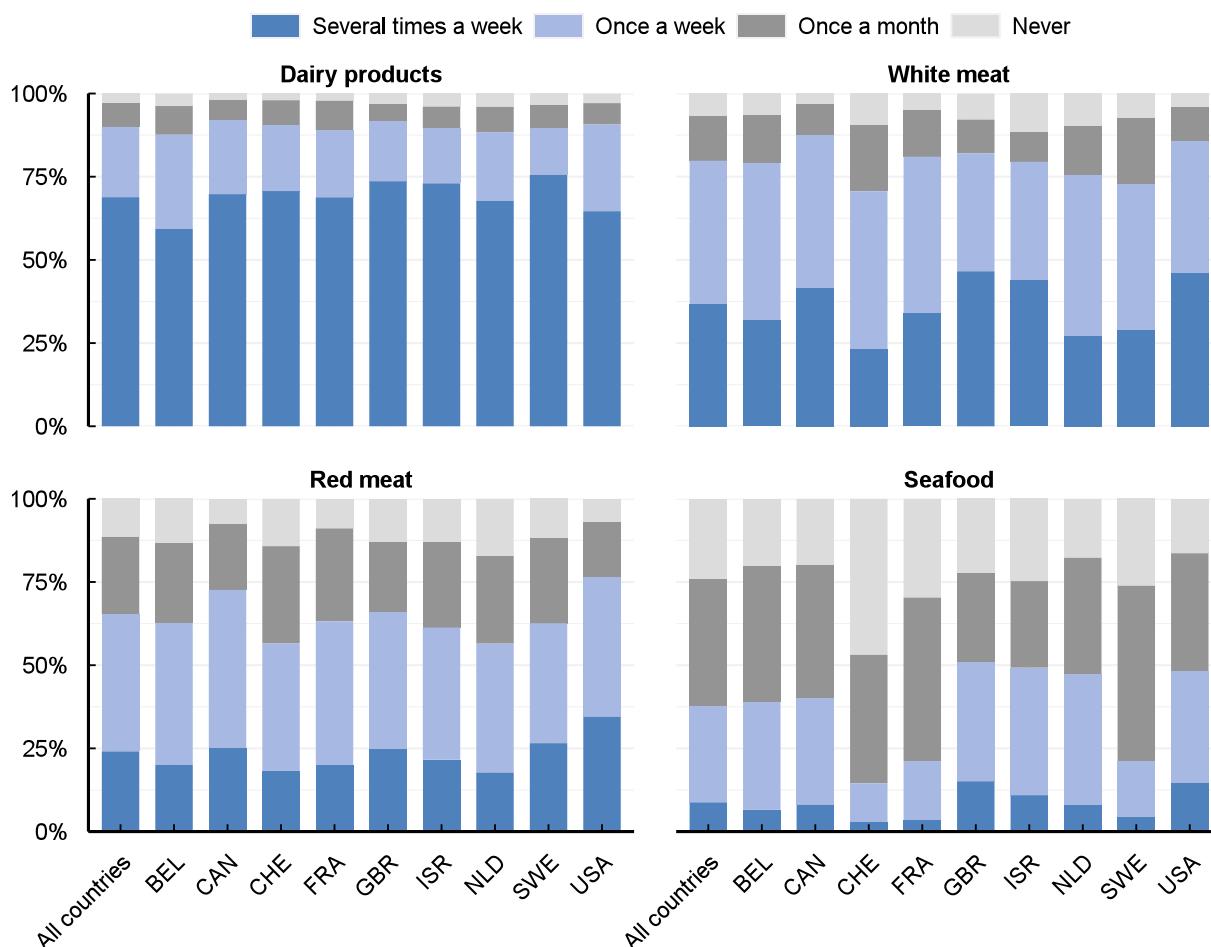
Note: This survey item asked respondents: "How often do you personally do the following?" For each type of food, respondents could choose never, once a month, once a week or several times a week.
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ᯏᯏᯏ https://stat.link/xsife1

All countries indicate a consistent association between higher incomes and the consumption of dairy products, red meat, seafood and white meat. The correlation appears strongest for red meat and seafood. Those in the upper income quintiles report eating meat more frequently than those in the lower income quintiles: 29% of respondents in higher-income households report eating meat several times a week, compared to 20% of respondents in lower-income households. Similarly, 15% of those in lower-income households report never eating red meat compared to 8% in higher-income households. In the United States, where consumption of red meat is relatively high, there is a smaller difference between lower and upper-income households (4 percentage points). Other studies have also found strong positive correlations between income and meat consumption, although a negative correlation has been observed at very high levels of income in some cases (Bonnet et al., 2020[23]).

Red meat consumption appears to be correlated with income to a greater extent than with environmental concern (Figure 5.2). Among respondents who are environmentally concerned, a slightly smaller proportion report eating red meat several times a week compared to those less concerned (Figure 5.2). The differences range from 3 percentage points in the United States to 12 percentage points in the United Kingdom. On average, 12% of respondents with high environmental concern report never eating red meat, compared to 10% of respondents with low environmental concern. This relatively small difference could point to the fact that other factors, such as animal welfare or personal health, may also be important in determining red meat consumption, or that there is still limited public awareness of the environmental impacts of red meat.

Figure 5.2. Environmentally concerned respondents are less likely to consume red meat several times a week

Percentage of respondents consuming red meat by frequency and environmental concern
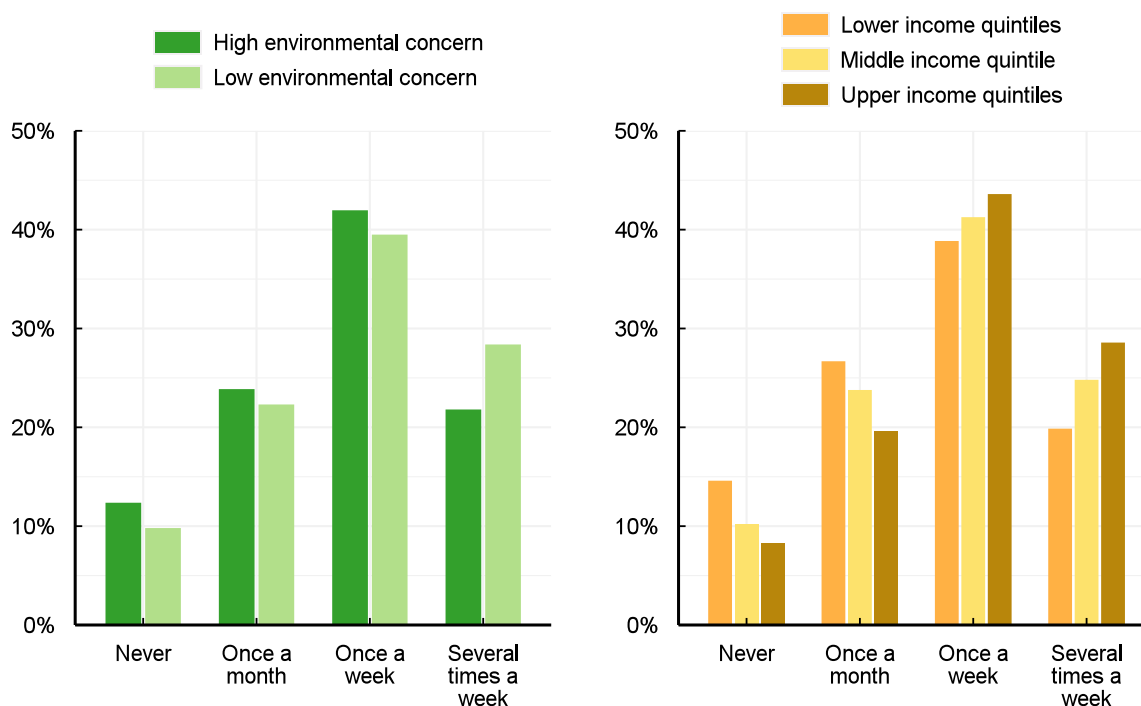
Note: This survey item asked respondents: "How often do you personally do the following?" For each type of food, respondents could choose never, once a month, once a week or several times a week.
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink 🔗 https://stat.link/ns6kqz

In light of evidence suggesting that red meat consumption is driven more by income than by environmental concern, awareness campaigns and other soft environmental policy instruments could focus on the lower costs and health-related co-benefits of reducing red meat consumption (IPCC, 2019[8]; Willett et al., 2019[24]). Persuasive communication has been shown to successfully reduce red and processed meat consumption (Carfora et al., 2019[25]). A particular target group could be environmentally concerned consumers that are not aware of the environmental impacts of meat production. Labelling schemes and certification programmes can promote better understanding regarding sustainable diets, although existing evidence on the effectiveness of sustainability labels in shifting behaviour is inconclusive (Godfray et al., 2018[5]).

When asked about their willingness to substitute red meat for a lab-grown alternative, 28% of respondents overall indicate a willingness to do so, while 44% indicate that they would not be willing to do so, and the rest report being undecided. Willingness to try lab-grown meat is lowest in France, at 20% of respondents, and highest in Israel, where 41% of respondents report being comfortable in doing so.

Willingness to try lab-grown meat also varies significantly by environmental concern, age and gender (Figure 5.3). In all countries, a considerably larger proportion (33%) of those highly concerned about the environment report being willing to try lab-grown meat than those who are less concerned (19%). Generally, younger respondents also exhibit a greater willingness to try it than older respondents (41% versus 16%), with men generally appearing more willing than women. This difference is greatest in the United Kingdom, where 47% of men would be willing to consume lab-grown meat compared to 26% of women. Exceptions are Belgium and Israel, where a similar proportion of men and women report being willing to do so (32% versus 24%). Across income, the differences in willingness to try lab-grown meat are smaller; 27% of respondents from lower income quintiles are willing to try lab-grown meat compared to 31% of respondents from upper income quintiles.

Reservations about possible health impacts are the most frequently cited reason for respondents not being willing to try lab grown meat, with 29% of respondents citing it as a concern. Respondents also cite its presumed inferior taste or nutritional value (13%), high cost (11%), or incompatibility with their culture or values (10%).

These results can be used to identify groups of consumers likely to be most receptive to policies encouraging a shift from food products with high environmental impact to lab-grown or plant-based meat. Reducing reservations about meat alternatives among those with low acceptance could encourage more households to make dietary changes. Supply-side production standards and environmental labelling of meat alternatives will be important measures to increase consumer confidence in new, more sustainable food products such as lab-grown meat (Frezal, Nenert and Gay, 2022[19]).

Figure 5.3. Willingness to try lab-grown meat varies by environmental concern, age and gender

Percentage of respondents willing to try lab-grown meat
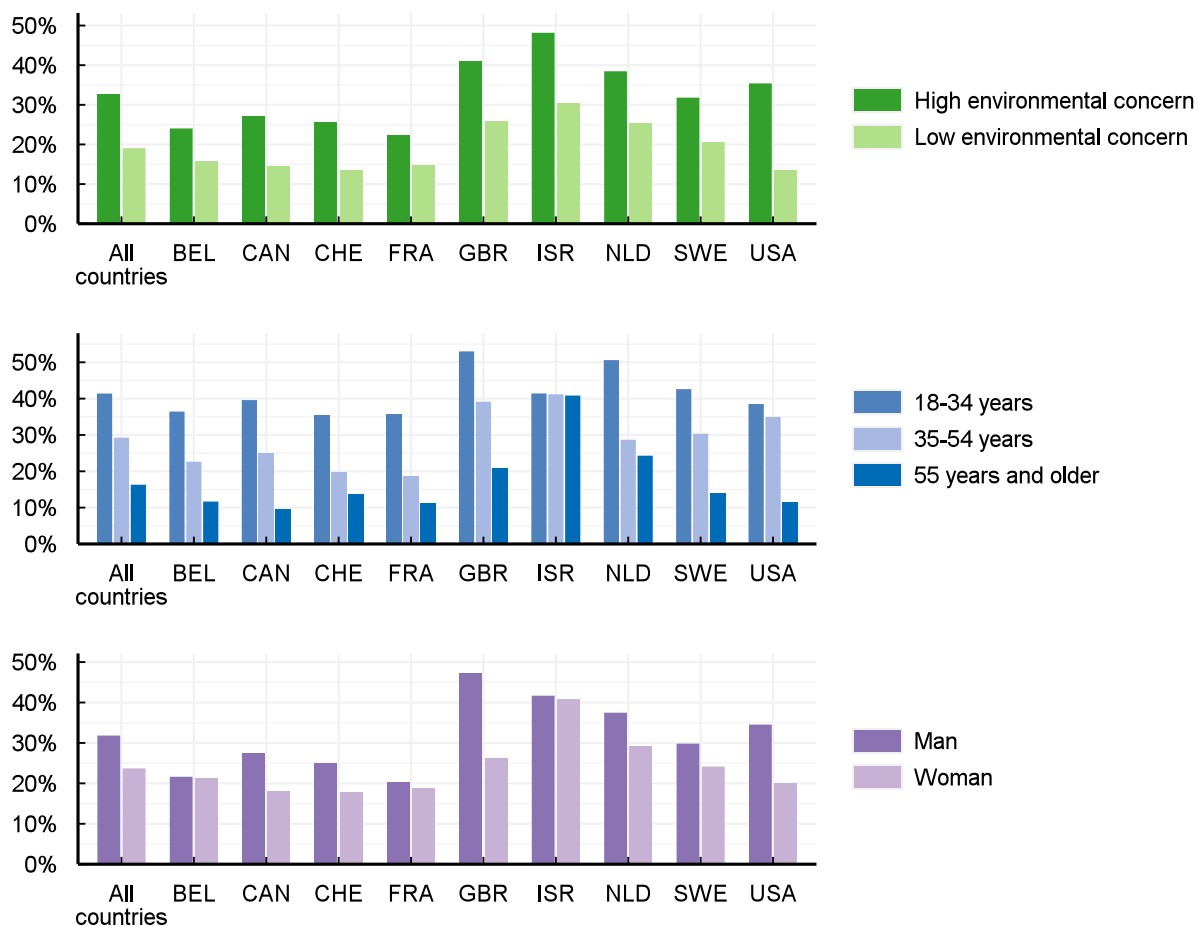
Note: This survey item asked respondents: "If available in the future, would you be willing to substitute conventional meat with lab-grown meat?".
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ᠍ᡗᠯᡖ https://stat.link/ce68sq

5.3. Household shopping habits

5.3.1. Food purchasing priorities

When purchasing food, respondents generally prioritise affordability, taste, nutrition and freshness (Figure 5.4). Although some reordering of priorities can be seen across income and environmental concern, they remain the top four priorities for respondents across categories. This is also the case for other variables, such as presence of children in the household or whether respondents shop at local stores. Environmental considerations generally matter a great deal less to respondents. Other studies have also found that on average, price, taste, nutrition and safety are among the most important values for food consumers, but that priorities differ significantly across consumers and food consumption habits (Lusk and Briggeman, 2009[26]). In June 2022, a surge in consumer prices and falling real wages affected purchasing power in many OECD countries (OECD, 2022[27]); the importance of affordability could be partly driven by the cost-of-living crisis during which the survey was implemented.

Respondents across high-income households give more weight to freshness, taste and healthiness than do lower income households (Figure 5.4). Among high-income households, 58% of respondents state that affordability is an important factor to them when purchasing food products compared to 69% of low-income households. However, respondents in all income groups still report that affordability is a higher priority than environmental considerations such as low emissions, organic or local production. Households with children prioritise taste more than those without children. Additionally, households that buy at local bakeries, butchers and fruit and vegetable shops appear to value freshness and health over affordability than those who rarely or never shop at local stores. Older respondents and those who live in rural areas report valuing locally produced food more than younger or urban residents. This finding is true across all income quintiles. Younger respondents and respondents with higher education prioritise organic food and low emissions production to a greater extent than older respondents and those without higher education.

The fact that affordability remains a top priority even for respondents who are highly environmentally concerned suggests that differing priorities among households that shop locally is not driven by environmental concern, but rather by the perceived freshness of the food and the associated health considerations. If this result is found to hold against additional control variables in further analyses, this could indicate that shopping locally affects purchasing priorities (Johe and Bhullar, 2016[28]). If this is the case, measures encouraging households to use local shops more often could be used to instil and leverage environmentally desirable social norms and behaviours (Nyborg et al., 2016[29]).

Research has shown that consumers are generally unaware of the extent to which their choice of food impacts the environment (de Boer, de Witt and Aiking, 2016[30]). This could partly explain the low prioritisation of environmental factors such as emissions, even among the environmentally concerned. A variety of policy measures could help to engage consumers in reducing the environmental impacts of their food purchases. Information can be spread through environmental labels, government guidelines and awareness campaigns. The latter could also draw attention to the co-benefits of choosing sustainable food where they align with consumers' priorities of eating healthily and getting value for money. Other studies have shown that food is often selected simply through habit, which is difficult to target using information or by appealing to values (Abrahamse, 2020[31]; Campbell-Arvai, Arvai and Kalof, 2014[32]). Behavioural interventions, such as offering vegetarian dishes as the default option in school cafeterias, could be complemented with information and educational campaigns. Supply-side interventions, such as setting and enforcing environmental standards, could provide important support to sustainable food policies by addressing the affordability, availability, nutrition and taste of sustainable options.

Figure 5.4. Environmental considerations are not high priorities when purchasing food

Percentage of respondents considering the factor important by income group and environmental concern
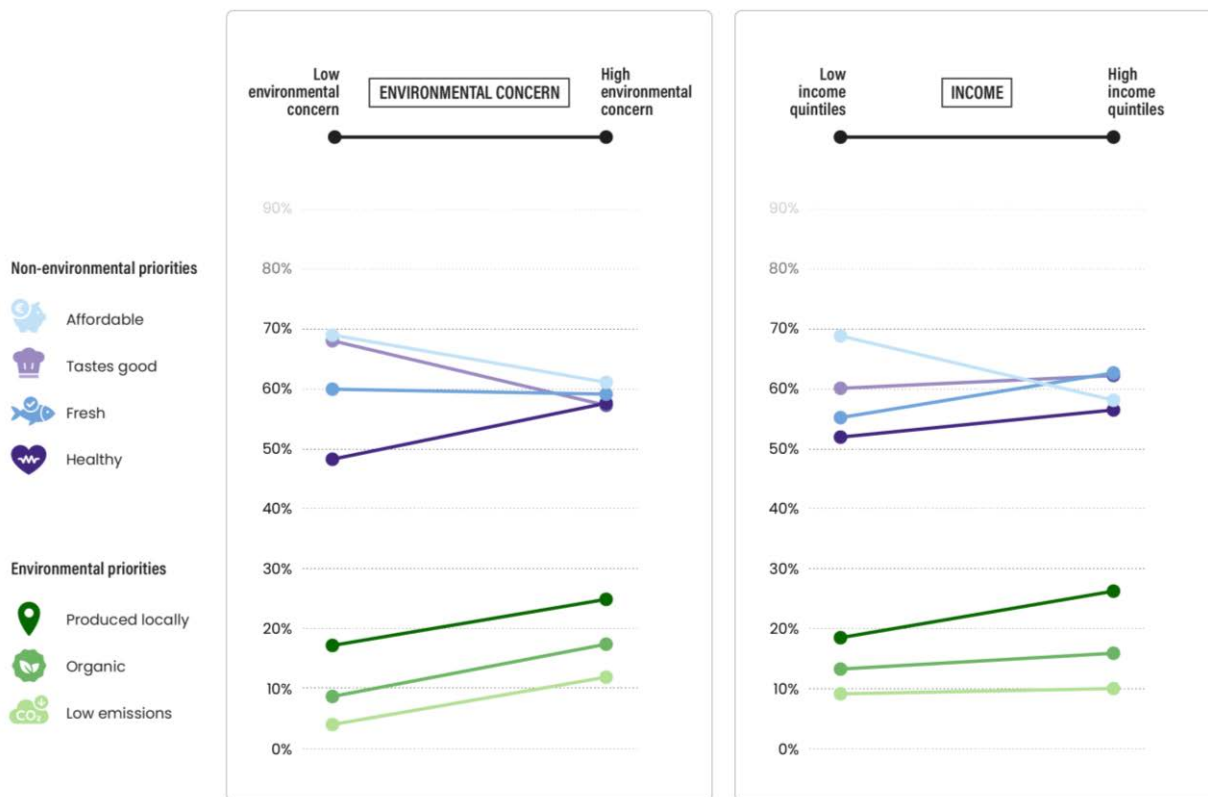
Note: This survey item asked respondents: "What is most important to you when you are choosing which foods to buy? Please select maximum 5." The figure shows the percentage of respondents who selected the factor.
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ⇲ https://stat.link/xumb2a

5.3.2. Consumption of sustainable food products

The survey asked households how often they eat products that are in season, locally produced and organic, as well as processed foods (Figure 5.5). Overall, 56% of households report that they often or always consume locally produced foods, compared to 47% that often or always consume processed snacks and pre-prepared foods. Consumption of organic food is lower, with an average of 20% of households reporting that they often or always consume organic products. The lowest consumption of organic products is in Israel (11% of households), and highest in Switzerland, at 31%.

Figure 5.5. Consumption of local, seasonal, organic and processed food

Percentage of respondents often or always consuming local, seasonal, organic and processed food
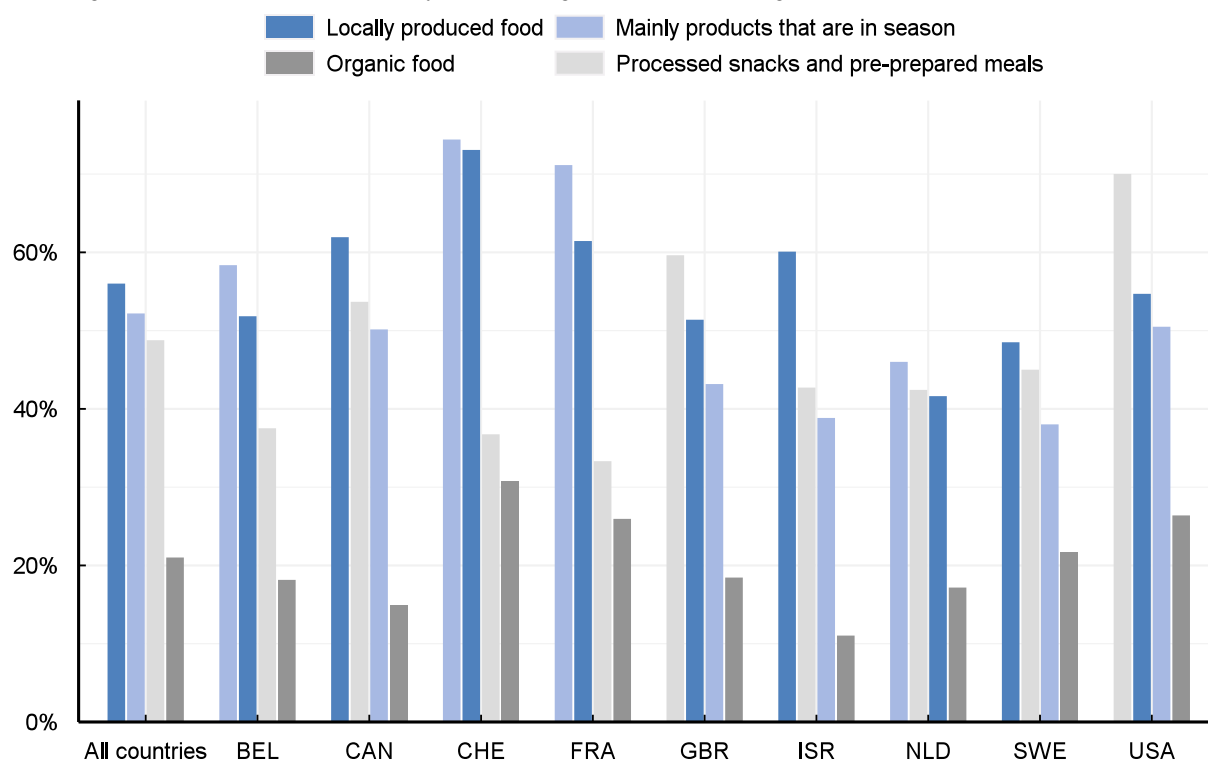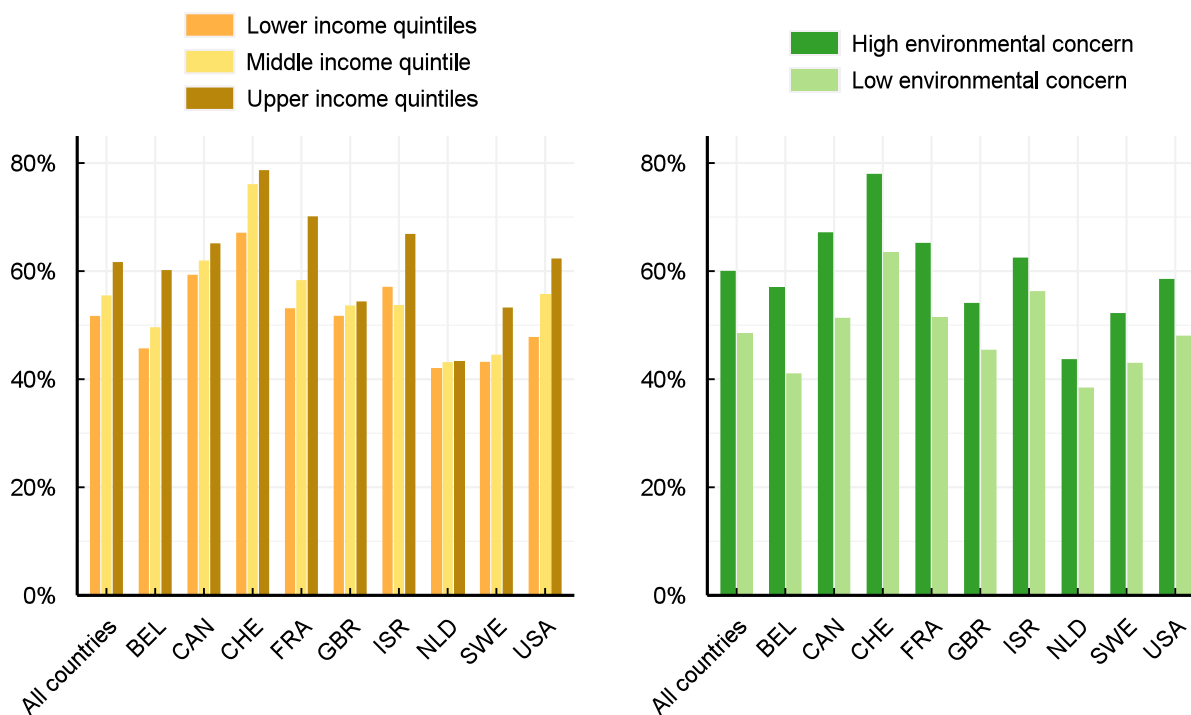

Note: This survey item asked respondents: "How often do you personally do the following?" For each type of food, respondents could choose never, rarely, sometimes, often or always.

Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ᵃᵏˢᵖ https://stat.link/6io9cl

In most countries, respondents from lower-income households are more likely to report that they never consume organic food (Figure 5.6). Belgium and Sweden are exceptions, with no evident association between organic food consumption and income. On average, 26% of households in the upper income quintiles report consuming organic food, compared to 18% of those in the lower income quintiles (Figure 5.6). Differences in reported organic food consumption across income quintiles is greatest in Switzerland and the United States. Younger respondents also report more frequent consumption of organic food than older respondents. Across all countries, 28% of those aged 18-34 report frequently doing so, compared to 15% of those 55 and older. Shopping at local stores also appears to be associated with organic food consumption. In total, 33% of those who often shop at local stores report frequently purchasing organic food, compared to 16% of those who do not do so. Finally, environmental concern appears to be strongly associated with purchasing organic food. Overall, 26% of those with high environmental concern report frequently purchasing organic food, compared to 13% of those with lower environmental concern.

As with other types of environmental behaviour, evidence points to an attitude-behaviour gap in organic food purchases (Hughner et al., 2007[33]). The literature shows that while consumers generally hold favourable views of organic food, largely due to its perceived health, taste and food safety benefits, only a small proportion buy organic products. The higher price of organic food has been found to be the main obstacle to purchasing organic food, followed by a lack of availability, and satisfaction with conventional food (Aschemann-Witzel and Zielke, 2017[34]). These points indicate that to support organic food consumption, policies could seek to reduce price differentials between organic and conventional food, provide information on the environmental benefits of organic food and the reasons why it can be more

expensive to produce than conventional food, and correct misperceptions regarding its actual affordability. The price difference between conventional and organic food could be reduced by revising agricultural subsidies and environmental regulations (Aschemann-Witzel and Zielke, 2017[34]).

Figure 5.6. Organic food consumption varies by respondent characteristics

Percentage of respondents often or always consuming organic food
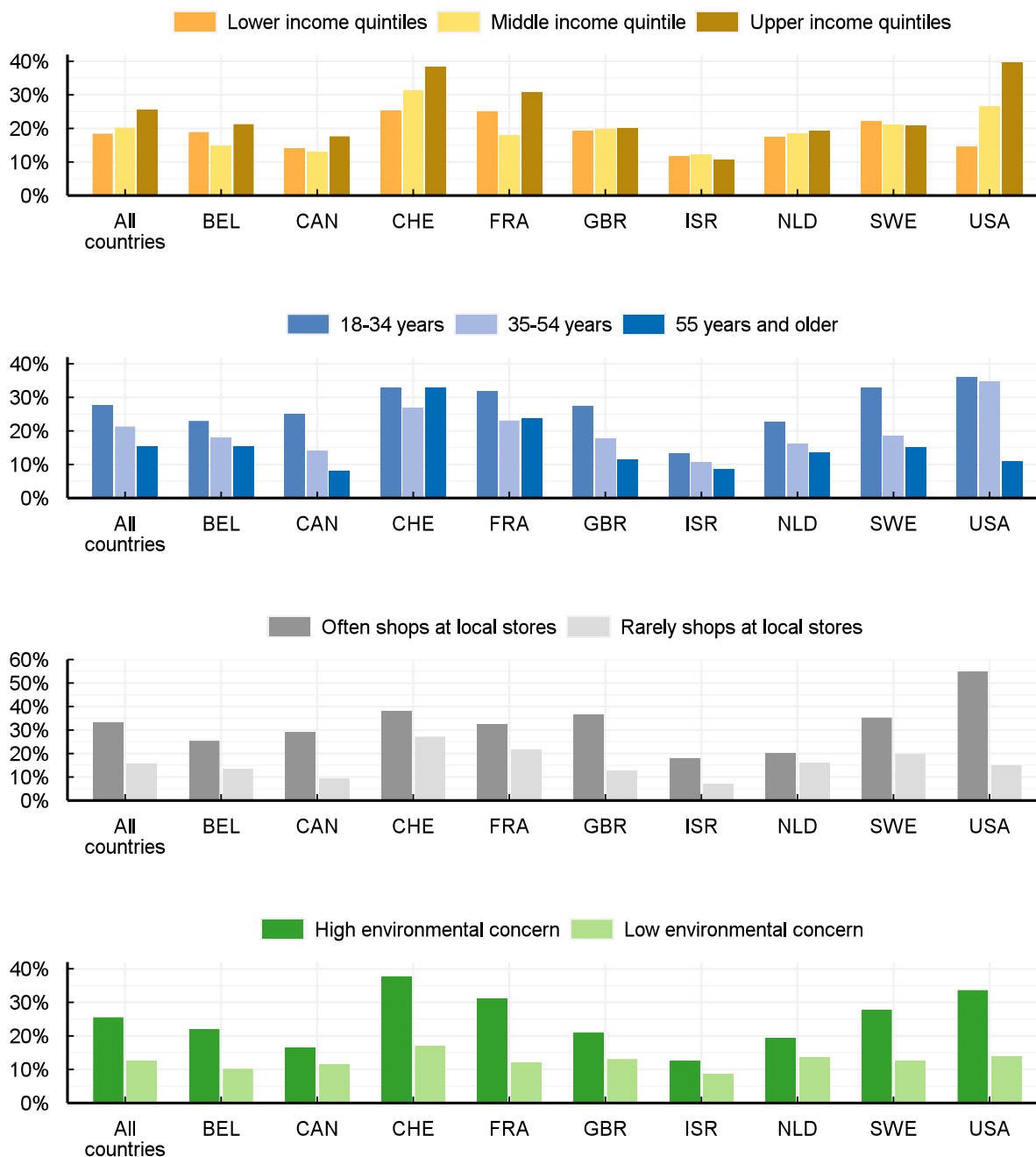
Note: This survey item asked respondents: "How often do you personally do the following?" For each type of food, respondents could choose never, rarely, sometimes, often or always. In a separate survey item, respondents were asked where their food typically comes from, with one response option as "Local food shops (e.g. bakeries, butcheries, fruit and vegetable shops)."
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink 🔳🖙 https://stat.link/4k6obw

In the survey, younger respondents and those with children in the household more commonly report eating processed food, a result that may in part be due to convenience. Across countries, there appears to be no clear relationship between income and the consumption of processed food, but respondents living in rural areas report consuming it less often. Eating food 'in season' is more common among respondents over the age of 55, and this also varies according to where the food is bought – in all countries, more seasonal food is eaten by households that regularly shop at their local stores (Figure 5.7).

More locally produced food is eaten by high-income households and those with high environmental concern (Figure 5.8), except in the Netherlands, where there is no apparent association with income and consumption of locally produced food is generally low. Across most countries, there appears to be no association between consuming locally produced or seasonal food and living in an urban or rural area. The exception is the United States, where urban residents purchase locally produced food more frequently than rural residents. Interest in buying locally produced food has increased over the past 20 years and has been found to depend more on norms and attitudes, such as environmental concern, than socio-economic status (Wenzig and Gruchmann, 2018[35]). As with organic food, there is also a common perception among consumers that locally produced food is healthier (Feldmann and Hamm, 2015[36]). As shown in Box 5.1, the COVID-19 pandemic had an impact on some types of food consumption behaviour.

Figure 5.7. Age and shopping locally are associated with greater seasonal food consumption

Percentage of respondents often or always eating seasonal food
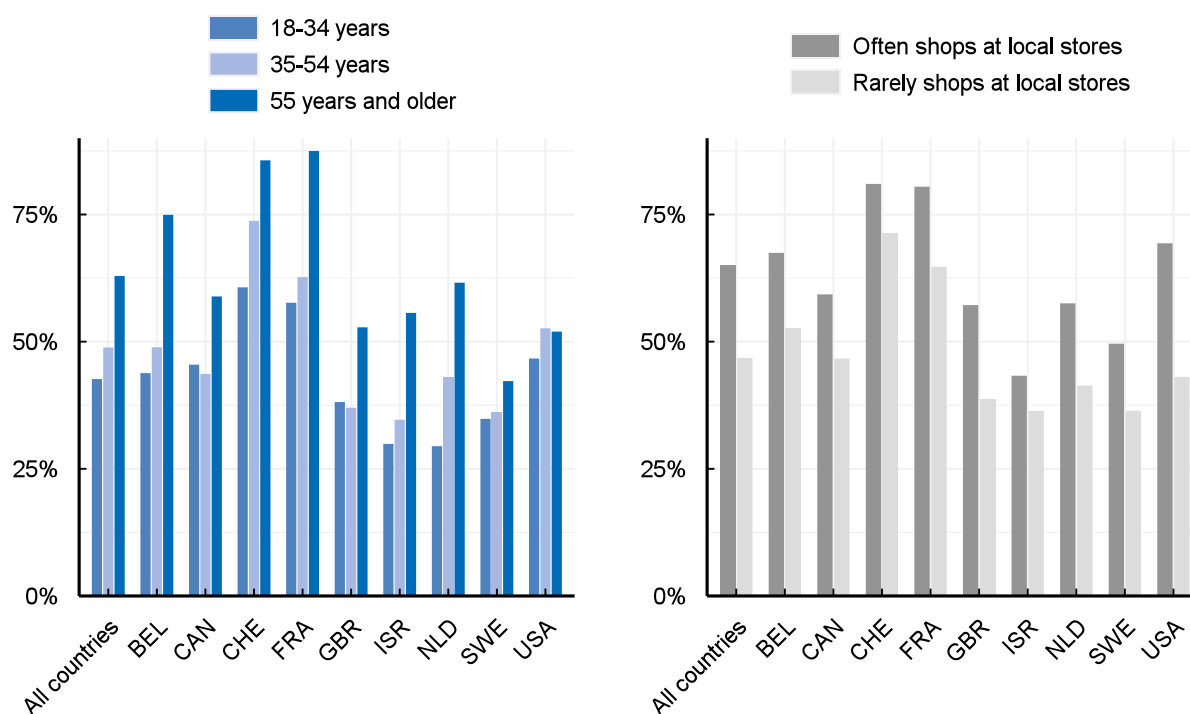
Note: This survey item asked respondents: "How often do you personally do the following?" For each type of food, respondents could choose never, rarely, sometimes, often or always.
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ⬛🖵 https://stat.link/1sauc8

Figure 5.8. Wealthier and environmentally concerned respondents are more likely to consume locally produced food

Percentage of respondents consuming locally produced food once or several times a week

Note: This survey item asked respondents: "How often do you personally do the following?" For each type of food, respondents could choose never, once a month, once a week or several times a week.
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ᔕᔑᔕᔐ https://stat.link/6gomkx

Box 5.1. COVID-19 affected some food consumption behaviours

The EPIC Survey was implemented in June and July 2022 when restrictions introduced during the COVID-19 pandemic had been significantly eased or removed in the nine participating countries. Respondents indicated that they expect some changes to their food consumption habits following the pandemic (Figure 5.9). With the exception of Israel, the United States and the United Kingdom, respondents expect overall to buy groceries online less frequently after the pandemic than before the pandemic. The reason for this finding is unclear. In some countries, an emphasis on shopping as a means to help local communities recover economically may result in fewer households ordering food online from large distributors. Respondents in most countries also report that they expect to order food for takeout or delivery less frequently after the COVID-19 pandemic. Dining out appears to be the most significant reported change, as 29% of respondents across all countries expect to dine out less, while 18% expect to do so more often.

Figure 5.9. The COVID-19 pandemic is changing households' food consumption habits

Percentage of respondents
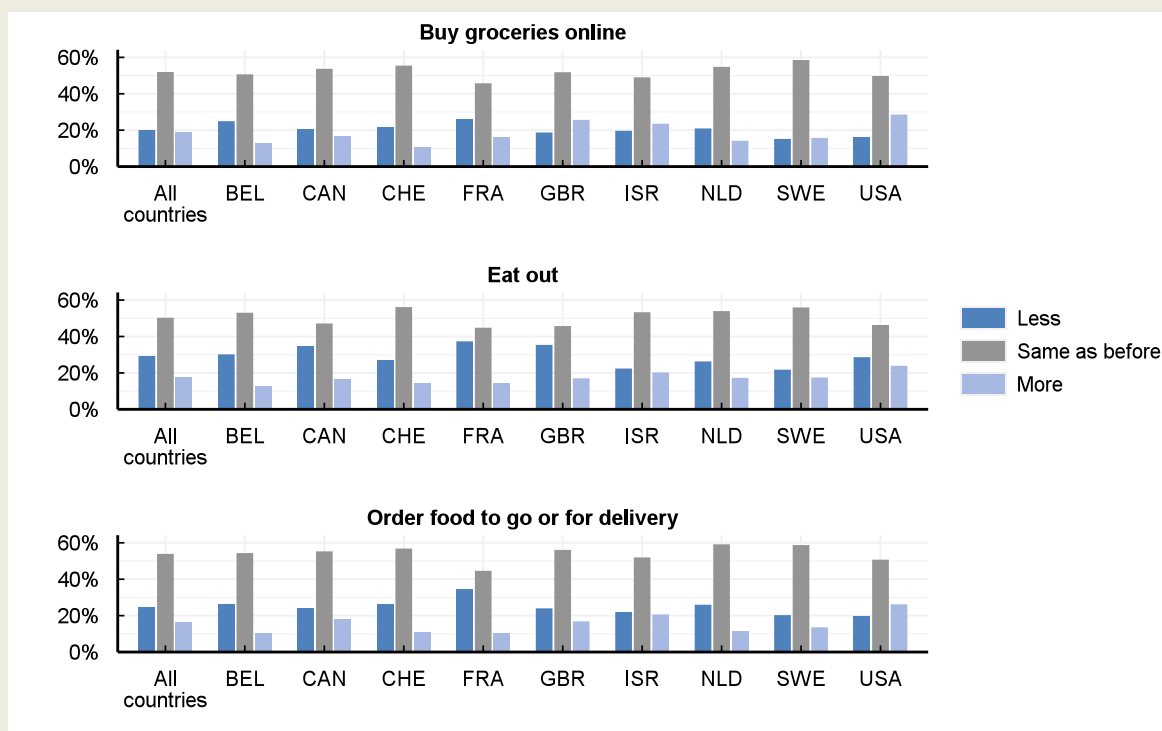
Note: This survey item asked: "Compared to before the COVID-19 pandemic, how often do you expect to do the following once the COVID-19 pandemic is well under control?".
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink 🖳 https://stat.link/zd3vaf

Households that reported a reduction in income over the two years prior to the survey indicate that they expect to consume fewer processed snacks, pre-prepared meals, and organic food products than before, while the opposite is true for those reporting increased income over this period (Figure 5.10). The aggregate environmental impact of these changes is difficult to assess. Given that lower-income households appear to have experienced deeper income cuts than high-income households, policies

could consider measures helping lower income households to buy sustainable food products, especially when these are more expensive. Given that plant-based food products are often cheaper and less environmentally impactful than meat, dairy and seafood products, policies could also focus on promoting plant-based food purchases.

Figure 5.10. A decrease in income is associated with greater processed food consumption

Percentage of respondents consuming food product once or several times a week
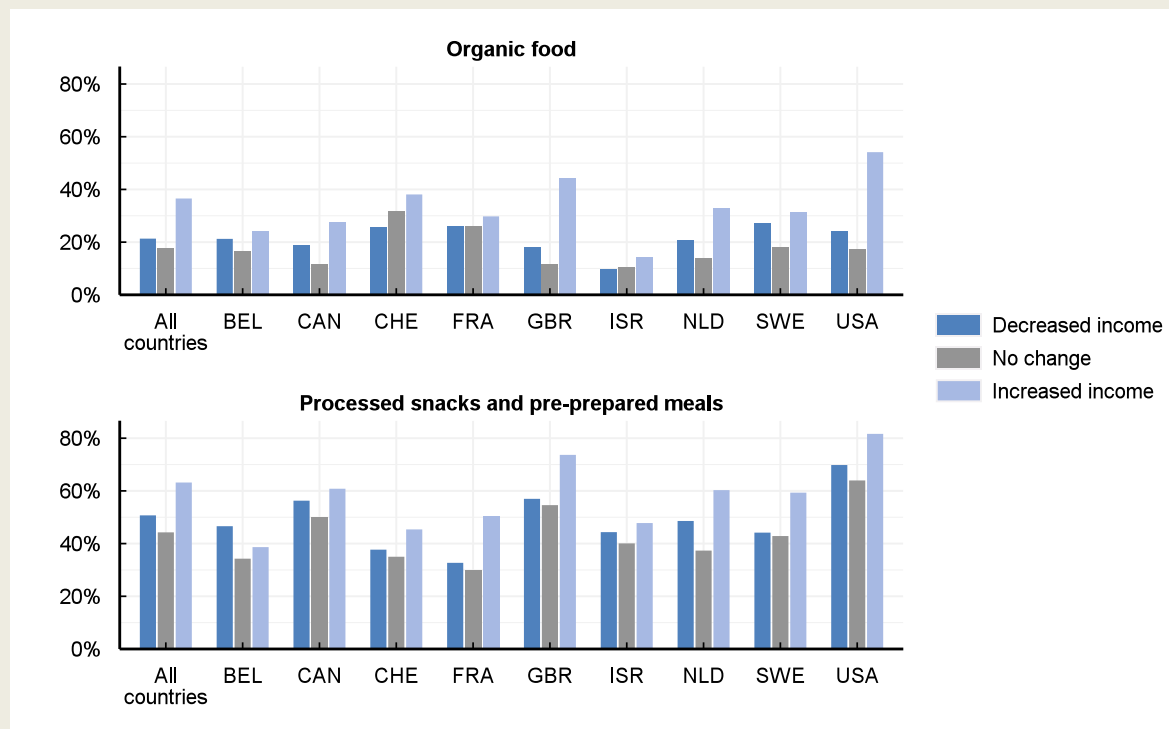
Note: This survey item asked respondents: "How often do you personally do the following?" For each type of food, respondents could choose never, once a month, once a week or several times a week. Respondents are grouped by their response to a question asking "Have you or someone in your household experienced a significant change income (+/- 20%) at any point in the past two years?".
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ⧉ https://stat.link/rby9k3

5.4. Support for food systems policies

As with all policy, successful implementation ultimately relies upon public support. This is particularly true for policies affecting households' daily activities. This survey finds general support for nearly all the food systems policy it addresses (Figure 5.11). Respondents express highest levels of support for educating school children about sustainable diets (78%), providing incentives for farmers to reduce environmentally harmful agricultural practices (74%), and stricter regulation of pesticide use, industrial animal farming and aquaculture (71%). Support for policies targeting the commercial elements of food systems is lower (57%), and much lower for a tax on meat or seafood (23%). More than one quarter (26%) of respondents strongly disagree with a tax-based policy, but less than 5% of respondents strongly disagree with the remainder of

the food systems policies. Concerns about fairness could underpin the general aversion to tax-based measures.

Socio-economic characteristics have little effect on respondents' support for food systems policies. A tax on meat or seafood is the exception, with support being notably higher among younger respondents and urban residents (35% and 30% respectively) than older age groups and rural residents (13% and 17%, respectively). Stricter regulations on the use of pesticides, incentives for farmers to use more environmentally friendly agricultural practices and education on sustainable diet are supported to a greater extent by older respondents. Households with children express greater support for a tax on meat or seafood than do households without, but support for other food systems-related policies, such as incentives for sustainable farming and stricter regulations on farming, is equal across both groups. Further analysis will be needed to determine whether this arises from differences in other factors such as income or financial precariousness.

Figure 5.11. Support for food system policies is high for all policies except a tax on meat or seafood

Percentage of respondents strongly agreeing with policies
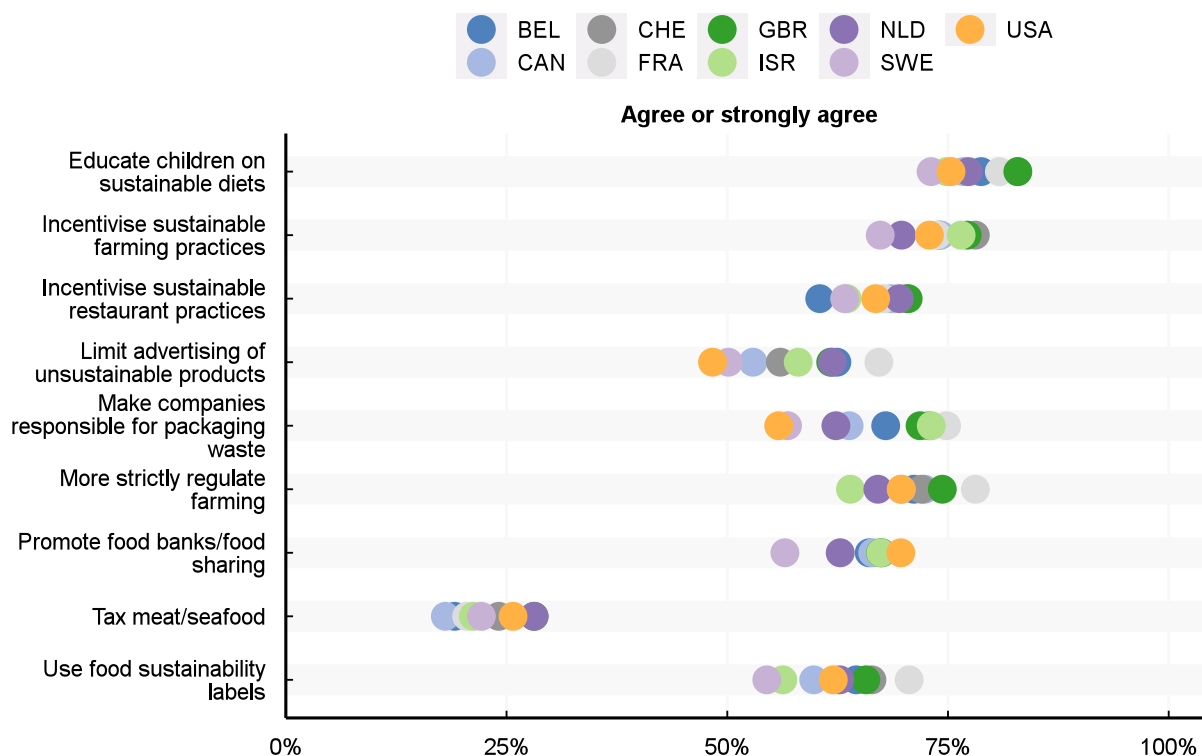
Note: This survey item asked respondents: "What do you think of the following measures to improve the environmental sustainability of food?" Respondents stated their level of agreement on a 5-point scale from "strongly disagree" to "strongly agree". The graphs show the top three policies with the highest proportion of strong agreement or strong disagreement per country.
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ⧉ https://stat.link/3leh9r

Environmental concern and shopping locally correlate with support for all types of policy (Figure 5.12), which is surprising considering that environmental concern has little impact on dietary habits and purchasing priorities (Section 5.3.1). Those that frequent local food shops express greater support for all measures, and especially a tax on meat or seafood.

Figure 5.12. Environmentally concerned respondents express greater support for all food systems policies

Percentage of respondents agreeing or strongly agreeing with policies
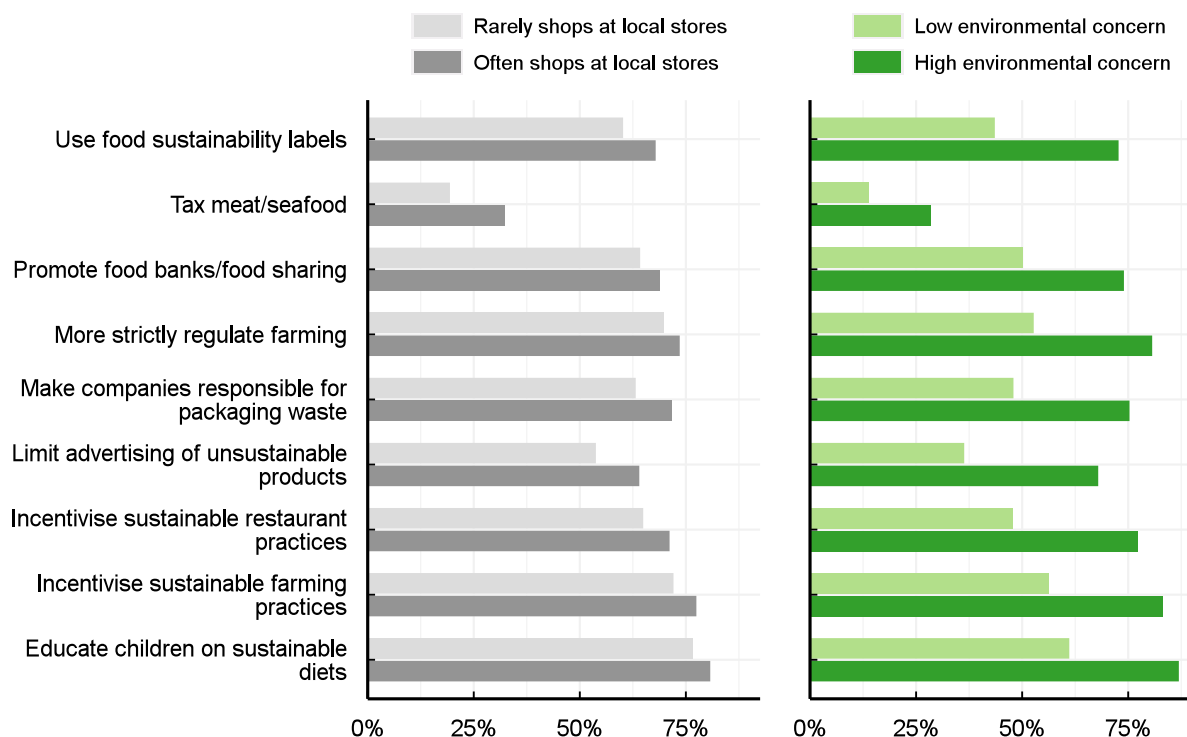
Note: This survey item asked respondents: "What do you think of the following measures to improve the environmental sustainability of food?" Respondents stated their level of agreement on a 5-point scale from "strongly disagree" to "strongly agree".
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ⬛⬛⬛ https://stat.link/nldw13

References

Abrahamse, W. (2020), "How to Effectively Encourage Sustainable Food Choices: A Mini-Review of Available Evidence", *Frontiers in Psychology*, Vol. 11, p. 3134, https://doi.org/10.3389/FPSYG.2020.589674/BIBTEX. [31]

Aschemann-Witzel, J. and S. Zielke (2017), "Can't Buy Me Green? A Review of Consumer Perceptions of and Behavior Toward the Price of Organic Food", *Journal of Consumer Affairs*, Vol. 51/1, pp. 211-251, https://doi.org/10.1111/JOCA.12092. [34]

Bonnet, C. et al. (2020), "Viewpoint: Regulating meat consumption to improve health, the environment and animal welfare", *Food Policy*, Vol. 97, https://doi.org/10.1016/j.foodpol.2020.101847. [23]

Campbell-Arvai, V., J. Arvai and L. Kalof (2014), "Motivating Sustainable Food Choices: The Role of Nudges, Value Orientation, and Information Provision", *Environment and Behavior*, Vol. 46/4, pp. 453-475, https://doi.org/10.1177/0013916512469099. [32]

Carfora, V. et al. (2019), "How to reduce red and processed meat consumption by daily text messages targeting environment or health benefits", *Journal of Environmental Psychology*, Vol. 65, p. 101319, https://doi.org/10.1016/J.JENVP.2019.101319. [25]

Clark, M. and D. Tilman (2017), "Comparative analysis of environmental impacts of agricultural production systems, agricultural input efficiency, and food choice", *Environmental Research Letters*, Vol. 12, https://doi.org/10.1088/1748-9326/aa6cd5. [15]

Crippa, M. et al. (2021), "Food systems are responsible for a third of global anthropogenic GHG emissions", *Nature Food*, Vol. 2/3, pp. 198-209, https://doi.org/10.1038/s43016-021-00225-9. [10]

de Boer, J., A. de Witt and H. Aiking (2016), "Help the climate, change your diet: A cross-sectional study on how to involve consumers in a transition to a low-carbon society", *Appetite*, Vol. 98, pp. 19-27, https://doi.org/10.1016/J.APPET.2015.12.001. [30]

FAO (2021), "Emissions due to agriculture Global, regional and country trends 2000-2018", *FAOSTAT Analytical Brief Series No 18*. [9]

Feldmann, C. and U. Hamm (2015), "Consumers' perceptions and preferences for local food: A review", *Food Quality and Preference*, Vol. 40/PA, pp. 152-164, https://doi.org/10.1016/J.FOODQUAL.2014.09.014. [36]

Foley, J. et al. (2011), "Solutions for a cultivated planet", *Nature*, Vol. 478/7369, pp. 337-342, https://doi.org/10.1038/nature10452. [7]

Frezal, C., C. Nenert and H. Gay (2022), "Meat protein alternatives: Opportunities and challenges for food systems' transformation", *OECD Food, Agriculture and Fisheries Papers*, No. 182, OECD Publishing, Paris, https://doi.org/10.1787/387d30cf-en. [19]

Giner, C. and J. Brooks (2019), "Policies for encouraging healthier food choices", *OECD Food, Agriculture and Fisheries Papers*, No. 137, OECD Publishing, Paris, https://doi.org/10.1787/11a42b51-en. [21]

Godfray, H. et al. (2018), *Meat consumption, health, and the environment*, https://doi.org/10.1126/science.aam5324. [5]

Hospido, A. et al. (2009), "The role of seasonality in lettuce consumption: A case study of environmental and social aspects", *International Journal of Life Cycle Assessment*, Vol. 14/5, pp. 381-391, https://doi.org/10.1007/s11367-009-0091-7. [16]

Hughner, R. et al. (2007), "Who are organic food consumers? A compilation and review of why people purchase organic food", *Journal of Consumer Behaviour*, Vol. 6/2-3, pp. 94-110, https://doi.org/10.1002/CB.210. [33]

IPCC (2022), *Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, https://doi.org/10.1017/9781009157926. [14]

IPCC (2019), *Climate Change and Land: an IPCC Special Report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems*, http://www.ipcc.ch. [8]

Johe, M. and N. Bhullar (2016), "To buy or not to buy: The roles of self-identity, attitudes, perceived behavioral control and norms in organic consumerism", *Ecological Economics*, Vol. 128, pp. 99-105, https://doi.org/10.1016/J.ECOLECON.2016.02.019. [28]

Lusk, J. and B. Briggeman (2009), "Food Values", *American Journal of Agricultural Economics*, Vol. 91/1, pp. 184-196, https://doi.org/10.1111/J.1467-8276.2008.01175.X. [26]

Nyborg, K. et al. (2016), "Social norms as solutions", *Science*, Vol. 354/6308, pp. 42-43, https://doi.org/10.1126/SCIENCE.AAF8317/SUPPL_FILE/NYBORGSM.PDF. [29]

OECD (2022), *OECD Economic Outlook, Volume 2022 Issue 2*, OECD Publishing, Paris, https://doi.org/10.1787/f6da2159-en. [27]

OECD (2021), *Making Better Policies for Food Systems*, OECD Publishing, Paris, https://doi.org/10.1787/ddfba4de-en. [1]

OECD (2018), *Human Acceleration of the Nitrogen Cycle: Managing Risks and Uncertainty*, OECD Publishing, Paris, https://doi.org/10.1787/9789264307438-en. [13]

OECD/FAO (2022), *OECD-FAO Agricultural Outlook 2022-2031*, OECD Publishing, Paris, https://doi.org/10.1787/f1b0b29c-en. [3]

Pimentel, D. and M. Burgess (2014), "Environmental and Economic Costs of the Application of Pesticides Primarily in the United States", *Integrated Pest Management*, Vol. 3, pp. 47-71, https://doi.org/10.1007/978-94-007-7796-5_2. [12]

Poore, J. and T. Nemecek (2018), "Reducing food's environmental impacts through producers and consumers", *Science*, Vol. 360/6392, pp. 987-992, https://doi.org/10.1126/science.aaq0216. [6]

Searchinger, T. et al. (2018), *Creating a Sustainable Food Future: A Menu of Solutions to Feed Nearly 10 Billion People by 2050 - Synthesis Report*, https://www.wri.org/our-work/project/world-resources-report/publications. [11]

Seferidi, P. et al. (2020), "The neglected environmental impacts of ultra-processed foods", *The Lancet Planetary Health*, Vol. 4/10, pp. e437-e438, https://doi.org/10.1016/S2542-5196(20)30177-7. [17]

Springmann, M. et al. (2016), "Analysis and valuation of the health and climate change cobenefits of dietary change", Vol. 113/15, https://doi.org/10.5287/bodleian:XObxm2ebO. [18]

Temme, E. et al. (2020), "Demand-Side Food Policies for Public and Planetary Health", Vol. 12, p. 5924, https://doi.org/10.3390/su12155924. [22]

Treich, N. (2021), "Cultured Meat: Promises and Challenges", *Environmental and Resource Economics*, Vol. 79/1, pp. 33-61, https://doi.org/10.1007/s10640-021-00551-3. [20]

van Dijk, M. et al. (2021), "A meta-analysis of projected global food demand and population at risk of hunger for the period 2010–2050", *Nature Food 2021 2:7*, Vol. 2/7, pp. 494-501, https://doi.org/10.1038/s43016-021-00322-9. [4]

Wenzig, J. and T. Gruchmann (2018), "Consumer Preferences for Local Food: Testing an Extended Norm Taxonomy", *Sustainability 2018, Vol. 10, Page 1313*, Vol. 10/5, p. 1313, https://doi.org/10.3390/SU10051313. [35]

Willett, W. et al. (2019), "Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems", *The Lancet*, Vol. 393/10170, pp. 447-492, https://doi.org/10.1016/S0140-6736(18)31788-4/ATTACHMENT/8B3A633D-E071-45DC-9684-0F022EDA80E8/MMC1.PDF. [24]

World Bank and OECD (2022), *Agriculture, forestry, and fishing, value added (constant 2015 US$)*, Agriculture, forestry, and fishing, value added (constant 2015 US$), https://data.worldbank.org/indicator/NV.AGR.TOTL.KD (accessed on 29 June 2022). [2]

Notes

[1] The range reflects the mitigation potential of a scenario in which 50% of the global population adopts diets with less than 60g of animal-based protein up to a scenario in which the global adoption adopts a vegetarian diet, not accounting for land-use change (IPCC, 2019[8]).

[2] See Annex B on the design and implementation of the EPIC survey and on the quality of the panel of respondents.

Annex A. OECD EPIC Survey background

Stated preference approaches

The EPIC Survey relies on a stated preference empirical approach to data collection. As opposed to revealed preference approaches, which make use of data on observed behaviours, stated preference approaches use data gathered by asking individuals to either report their actual behaviour, or report how they would behave in a given hypothetical situation. There are advantages and drawbacks to both revealed and stated preference approaches (OECD, 2018[1]). Although revealed preference approaches have high reliability and validity because they reflect the real-world constraints faced by individuals, this also constitutes a limitation insofar as analyses are limited to addressing only those choices and conditions that are available in real-world contexts. The main challenges of stated preference approaches, on the other hand, include response bias and sample representativeness.

Generally speaking, limitations of analyses based on survey data arise from the extent to which reported responses may differ from actual behaviours (i.e. hypothetical bias) as well as the extent to which the characteristics of survey respondents may diverge from those of the actual population. Hypothetical bias is a well-known issue in stated preference methods and a number of strategies have been employed to mitigate it, including informing respondents that their responses will be used to help develop public policies, and informing them about hypothetical bias and encouraging them to reflect on their choices carefully in light of this tendency. A number of ex-ante and ex-post strategies pertaining to survey design and statistical methods, respectively, can also be used to mitigate other biases (e.g. anchoring, order effects).

Despite the challenges identified above, stated preference approaches offer a number of significant advantages over revealed preference approaches when it comes to ex-ante policy evaluation (OECD, 2018[1]). Discrete choice experiments, for example, are well-suited to analysing choice in the context of relatively complex, multi-dimensional issues (Bateman et al., 2002[2]; OECD, 2018[1]). Flexibility to define decision scenarios allows for an evaluation of the impact of hypothetical policy interventions. Stated preference approaches also generate valuations of changes in health status and environmental quality that provide critical input into cost-benefit analyses.

Development of the survey was guided by a Steering Committee comprised of WPIEEP Delegates who provided input regarding policy issues of interest and relevant contextual considerations in their respective countries. A Scientific Advisory Committee of methodological and thematic area experts provided input regarding methodological best practice in survey design in light of the analytical objectives of the work. Finally an internal coordination group involving the IEA, ITF, and TAD also provided policy and technical feedback during the development of the survey instrument.

Survey questionnaire

PART A – SOCIO-DEMOGRAPHIC CHARACTERISTICS

To start with, we want to learn a few things about you and your household.

    1. What is your date of birth?

2. Do you have full or partial responsibility for any household purchases (e.g. utilities, groceries, vehicle purchases)?

1. Yes
2. No >> screen out

3. What is your biological sex?

1. Male
2. Female
3. Intersex
4. Prefer not to say

4. What gender do you identify as?

1. Man
2. Woman
3. Other
4. Prefer not to say

SCREEN:

In this survey, we often refer to households. Please note that we define a household as including one or several persons (family or non-family members) living in the same residence on a regular basis and sharing all or part of their living expenses (e.g. utilities, groceries).

Unless stated otherwise, please answer each question as it pertains to your **current** situation and behavior.

Remember that your answers to all questions in this survey are confidential.

5. Which of these ranges best reflects the approximate combined current monthly income of everyone in the household, *after tax*? *Please include income from all sources, including wages, government pensions, benefits and investments.*

1. Less than EUR 1 450
2. Between EUR 1 450 – 1 899
3. Between EUR 1 900 – 2 399
4. Between EUR 2 400 – 3 049
5. EUR 3 050 or more
6. Don't know
7. Prefer not to answer

6. How would you best describe the area in which you live?

1. Major town/city
2. Suburban (fringes of a major town/city)
3. Small town or village
4. Isolated dwelling (not in a town or village)
5. Other

7. How would you define your status in your current primary residence?

1. Living in a residence owned by yourself or your household
2. Living in a residence rented by yourself or your household
3. Living in another type of accommodation, e.g. university dormitory, army base, retirement home

8. How would you describe your primary residence?

   1. An apartment in a building with less than 12 apartments in total
   2. An apartment in a building with 12 or more apartments
   3. A detached house
   4. A semi-detached/terraced house
   5. Other

9. What is the size of your primary residence? (Please estimate)

   1. Less than 25 m^2 (Less than 270 ft^2)
   2. 25 m^2 –50 m^2 (270 ft^2 - 540 ft^2)
   3. 51 m^2–75 m^2 (541 ft^2 - 807 ft^2)
   4. 76 m^2–100 m^2 (808 ft^2 - 1070 ft^2)
   5. 101 m^2–150 m^2 (1071 ft^2 - 1610 ft^2)
   6. 151 m^2–200 m^2 (1611 ft^2 - 2150 ft^2)
   7. More than 200 m^2 (More than 2150 ft^2)
   8. Don't know

10. Do you have access to a garden or outdoor space in your primary residence (can be private or shared)?

    1. Yes
    2. No

11. How would you define your current household situation?

    1. Married or living as a couple (with or without children)
    2. Living with parents or other relatives
    3. Living alone
    4. Living as a single parent
    5. Sharing a house/flat with non-family members
    6. Other

12. How many adults of 18 years old or more (including yourself) usually live in your household?

    1. 1
    2. 2
    3. 3
    4. 4
    5. 5 or more

13. How many children/minors in the following age ranges usually live in your household?

Age range	Number of children in household (drop down menu)
0-4	0, 1, 2, 3, 4, 5+
5-8	0, 1, 2, 3, 4, 5+
9-14	0, 1, 2, 3, 4, 5+
15-17	0, 1, 2, 3, 4, 5+

14. What is the highest level of education that you have completed?

    1. No formal education/Some primary school
    2. High school diploma (including apprenticeship or technical diplomas)
    3. Some post-secondary education
    4. Bachelor's degree (BA, BS)

5. Post graduate degree (Master, PhD or equivalent)
6. Other

15. What is your current employment status? Note: Temporary leave can refer to furlough, sick leave, or parental leave.

1. Self-employed
2. Full time employee (employed or on temporary leave)
3. Part time employee (employed or on temporary leave)
4. Retired
5. Homemaker – househusband/wife
6. Seeking a job/unemployed
7. Student
8. Unable to work, e.g. disability
9. Other

16. In what sector are you employed (or were you last employed)?

1. Administration/Government
2. Leisure and hospitality
3. Economics/Finance/Insurance
4. Agriculture, fisheries or forestry
5. Transportation
6. Manufacturing/Construction
7. Information technologies and communication
8. Education/Research
9. Health/Social services
10. Wholesale or retail trade
11. Justice
12. Other sector
13. Not applicable/I have never been employed

17. How often do you feel worried about not being able to live on your household's current income?

1. Never
2. Once every few months
3. Once a month
4. Once a week
5. Every day
6. Prefer not to say

18. Have you or someone in your household experienced a significant change in income (+/- 20%) at any point in the past two years? *Please consider income from all sources, including wages, government pensions and benefits and investments.*

1. Yes, for reasons related to the Covid-19 pandemic
2. Yes, for reasons unrelated to the Covid-19 pandemic
3. No
4. I don't know
5. Prefer not to say

[IF Q19 == 1 OR Q19 == 2]

19. How much did your household's income change? Please take into account any unemployment compensation or Covid-related support you may have received.

-100% (Complete loss)	No change	>100% (More than doubled)	Don't know	Prefer not to say
	--	--		□	□
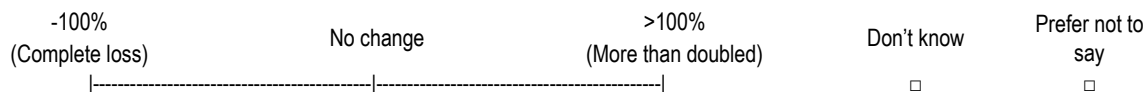
20. Please indicate approximately how often you telework for your current job. Teleworking refers to working from home while communicating with your office by phone, email, or using the internet.

	Never	1-3 days per month	1 day per week	2 days per week	3 days per week	4-5 days per week	6-7 days per week
Before the Covid-19 pandemic (prior to March 2020)	○	○	○	○	○	○	○
During the period(s) when there were the most restrictions where you live	○	○	○	○	○	○	○
Likely after the Covid-19 pandemic	○	○	○	○	○	○	○

PART B – ATTITUDINAL CHARACTERISTICS

21. How satisfied are you with your life at the moment?

Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
○	○	○	○	○

22. Now please recall your life satisfaction prior to the Covid 19 pandemic. How has your life satisfaction changed *as a result of the Covid-19 pandemic*?

Much less satisfied now	Less satisfied now	No change	More satisfied now	Much more satisfied now
○	○	○	○	○

23. How important are each of the following issues to you personally?

	Not at all important	Not important	Indifferent	Important	Very important	Prefer not to say
Climate change (e.g. rising average temperatures, extreme weather events) or other environmental issues (e.g. pollution)	○	○	○	○	○	○
Public health issues (e.g. the COVD-19 pandemic)	○	○	○	○	○	○
Inequality and discrimination (e.g. racial or gender-based)	○	○	○	○	○	○
Economic concerns (e.g. unemployment, price growth, poverty)	○	○	○	○	○	○
Political tensions (e.g. polarisation) or political violence (e.g. war)	○	○	○	○	○	○
Personal safety (e.g. crime, theft, gender-based violence)	○	○	○	○	○	○

[IF any Q23 >= 2]

24. Which of the following environmental issues are you most concerned with? *Please select your top three.*

	1	2	3
Outdoor air pollution			
Climate change (e.g. rising temperatures, changes in extreme weather events)			
Pollution from plastic waste			
Soil pollution (other than plastic waste, e.g. chemicals)			
Resource scarcity (e.g. water, food)			
Fragility of land ecosystems (e.g. loss of biodiversity, deforestation, species extinction)			
Fragility of sea/ocean ecosystems (e.g. depletion of natural habitat, species extinction)			
Water pollution (other than plastic waste, e.g. chemicals)			

25. How do you expect climate change (e.g. rising average temperatures, changes in extreme weather events) or other environmental issues to impact the following?

	Very negatively	Negatively	No impact	Positively	Very positively	Don't know
Your job security	○	○	○	○	○	○
Your health	○	○	○	○	○	○
Miscellaneous aspects of your quality of life (e.g. leisure activities, living environment)	○	○	○	○	○	○
The quality of life of younger generations (e.g. your children or grandchildren)	○	○	○	○	○	○

26. How satisfied are you with the following aspects of your local environment?

	Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied	Don't know
Access to green spaces (parks, forests)	○	○	○	○	○	○
Outdoor air quality	○	○	○	○	○	○
Food access (availability of supermarkets, farmers' markets)	○	○	○	○	○	○
Level of noise	○	○	○	○	○	○
The amount of litter and rubbish in the area	○	○	○	○	○	○
Natural landscape (visual appeal)	○	○	○	○	○	○
Recycling opportunities	○	○	○	○	○	○
Soil quality	○	○	○	○	○	○
Tap/drinking water quality	○	○	○	○	○	○
Water quality (lakes, rivers, seas and oceans)	○	○	○	○	○	○

27. Imagine you are looking for a new place to live. How important is it to you to live close to green space?

Not at all important	Not important	Indifferent	Important	Very important	Don't know
○	○	○	○	○	○

28. How has the importance of green space to you changed since the Covid-19 pandemic? It has become…

Much less important	Less important	No change	More important	Much more important	Don't know
○	○	○	○	○	○

29. To what extent do you agree with each of the following statements?

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Don't know/ Prefer not to answer
Environmental impacts are frequently overstated	○	○	○	○	○	○
I am willing to make in my current lifestyle for the benefit of the environment	○	○	○	○	○	○
Protecting the environment can boost the economy	○	○	○	○	○	○
Environmental issues should be dealt with primarily by future generations	○	○	○	○	○	○
Environmental issues should be resolved mainly through public policies	○	○	○	○	○	○
Environmental policies introduced by the government should not cost me extra money	○	○	○	○	○	○
Environmental issues will be resolved, primarily through technological progress	○	○	○	○	○	○
Environmental issues will be resolved mainly through individuals voluntarily changing their behaviour	○	○	○	○	○	○

30. Please indicate the sources of information you trust the most when it comes to environmental issues. Please rank up to three top sources from 1 (most trustworthy source) to 3 (third most trustworthy source):

	1	2	3
Researchers and scientific experts			
National government administration			
Local/regional government administration			
International organisations (e.g. United Nations, OECD)			
Non-governmental organisations (NGOs, e.g. WWF, Greenpeace)			
For-profit/private companies			
Politicians			
Media (Newspapers, TV, etc.)			
Social media			
Family, friends and neighbours			
I do not seek information on environmental issues			

31. Do you have confidence in the national government in [country]?

1. Yes
2. No
3. Don't know

PART C – ENERGY

This section contains general questions about energy consumption. In what follows, please consider each question as it pertains to your primary residence.

32. Which of the following energy sources do you use for space heating/cooling? Please select all that apply.

1. Electricity
2. Gas
3. Oil, coal or other fossil fuels
4. Wood or burning pellets
5. District heating or cooling
6. Heat pumps (ambient ground or air temperature is used to provide heating/cooling via a compressor)
7. Solar space heating
8. Other
9. Don´t know

33. Which of the following energy sources do you use for water heating? Please select all that apply.
    1. Electricity
    2. Gas
    3. Oil, coal or other fossil fuels
    4. Wood or burning pellets
    5. District heating or cooling
    6. Heat pumps (ambient ground or air temperature is used to provide heating/cooling via a compressor)
    7. Solar thermal
    8. Other
    9. Don´t know

34. Which of the following energy sources do you use for cooking? Please select all that apply.
    1. Electricity
    2. Gas (bottled, main, etc.)
    3. Biomass
    4. Oil
    5. Other
    6. Don´t know

35. How is your electricity supplied?

    1. Supplied from a provider through the standard grid.
    2. Supplied from a local mini- or micro- grid. (These grids generate electricity on a small scale and distribute it to a limited number of people operating independently of national networks.)
    3. Self-supplied by a system owned by one or more members of your household (for instance solar panels or a wind turbine).
    4. Other
    5. Don't know

36. How much was the average monthly cost for the electricity used by your primary residence over the past year? Please provide an approximate estimate (+/- 10%) :

EUR 25 or less	EUR 26–50	EUR 51-75	EUR 76-100	EUR 101-125	EUR 122-150	EUR 151-175	EUR 175-200	More than EUR 201	Don't know
○	○	○	○	○	○	○	○	○	○

37. Have any of the following been proposed to you by your energy provider?

	Yes and I have chosen this option	Yes, but I have not chosen this option	No, and I am not interested	No, but I would be interested	Don't know
Electricity generated by renewable energy sources (e.g. wind, solar, tidal, geothermal, or hydropower)	○	○	○	○	○
Differentiated electricity rates for peak hours (e.g. early evening) and off-peak hours (e.g. night time)	○	○	○	○	○
Smart electricity meters that allow you to monitor your energy consumption	○	○	○	○	○
The option to self-generate electricity for your own use or to sell it back to the grid	○	○	○	○	○
A device that optimises energy use by automatically controlling your heating/cooling and appliances based on your desired settings	○	○	○	○	○

[IF Q37c == "Yes and I have chosen this option"]

38. Do you use the information collected by your smart meter?

1. I use the information from the smart meter and it has helped me to reduce my household's electricity consumption
2. I look at the information from the smart meter but I have not used this information to reduce my electricity consumption
3. I don't look at the information displayed from the smart meter
4. This information is not provided to me

39. Thinking about your energy use at home, what statement best describes your household?

1. I/we use as much electricity and fuel as I/we want
2. I/we cannot use as much as I/we need due to the high cost
3. I/we satisfy my/our needs but try to minimise use for financial reasons
4. I/we satisfy my/our needs but try to minimise use for environmental reasons
5. I/ we cannot use as much as I/we need due to unreliable/unavailable supply
6. Other
7. Don't know

40. How often do you do the following in your daily life?

	Never	Occasionally	Often	Always	Not applicable
Turn off lights when leaving a room	○	○	○	○	○
Minimise the use of heating (e.g. by dressing warmly) and cooling (e.g. by avoiding using air conditioning)	○	○	○	○	○
Only run full loads when using washing machines or dishwashers	○	○	○	○	○
Minimise hot water use (e.g. when doing the dishes or taking showers)	○	○	○	○	○
Air dry laundry rather than using a clothes dryer	○	○	○	○	○
Open the windows in the winter for fresh air	○	○	○	○	○

[For respondents that don't always engage in all energy efficiency behaviours in Q40]

41. Your answers on the previous question indicate that you do not always try to reduce energy consumption in your household. Please help us understand the most important reasons why not: Please select all that apply:

1. I am willing to change my habits but I forget to do so
2. Environmental issues are important to me but it's too difficult to change my habits
3. I don't believe a serious environmental problem related to energy consumption exists
4. Others in my household would not cooperate or I would receive criticism from those around me
5. I feel like my other environmental actions already make enough of a difference
6. My behaviour changes will not make a difference
7. I won't see any personal benefit from changing my behaviour
8. I don't know how to decrease my energy consumption further
9. I feel confident that technological innovations will solve environmental problems
10. Other

42. Have you installed any of the following items over the past ten years in your current primary residence?

	Yes	No	Don't know
Highly energy-efficient appliances (e.g. washing machines, refrigerators)	○	○	○
Low-energy light bulbs (e.g., compact fluorescent, LED)			
Energy-efficient windows (e.g. double or triple glazed windows)	○	○	○
Thermal insulation of walls/roof/floor	○	○	○
Thermostats	○	○	○
Solar panels for electricity	○	○	○
Solar water heating	○	○	○
Battery storage	○	○	○
Heat pumps (ambient ground and air temperature is used to provide heating/cooling via a compressor)	○	○	○
Other	○	○	○

[Only show items for which the respondent answered Yes in Q42]

43. Has governmental financial support (e.g. grants, loans with below-market interest rates, tax exemptions) encouraged you to install any of the following items in your residence?

	Yes	No	Don't know
Highly energy-efficient appliances (e.g. top-rated washing machines, refrigerators)	○	○	○
Energy-efficient windows (e.g. double or triple glazed windows)	○	○	○
Thermal insulation of walls/roof/floor	○	○	○
Thermostats	○	○	○
Solar panels for electricity	○	○	○
Solar water heating			
Battery storage	○	○	○
Heat pumps (ambient ground and air temperature is used to provide heating/cooling via a compressor)	○	○	○
Other	○	○	○

[Only show items for which the respondent answered No to in Q42]

44. Why haven't you installed the following items?

	Already equipped/ installed more than ten years ago	I am planning to install this in the next two/three years	I am interested but cannot afford it	Not possible (not feasible in my house/ apartment/area and/or my landlord would need to install this)	I am not interested	I am not aware of this or don't know if it is possible to install in my area/home
Highly energy-efficient appliances (e.g. top-rated washing machines, refrigerators)	○	○	○	○	○	○
Energy-efficient windows (e.g. double or triple glazed windows)	○	○	○	○	○	○
Thermal insulation of walls/roof/floor	○	○	○	○	○	○
Thermostats	○	○	○	○	○	○
Solar panels for electricity	○	○	○	○	○	○
Solar water heating	○	○	○	○	○	○
Battery storage	○	○	○	○	○	○
Heat pumps (ambient ground and air temperature is used to provide heating/cooling via a compressor)	○	○	○	○	○	○

45. How important would the following factors be in encouraging you to reduce your energy consumption?

	Not at all important	Not important	Indifferent	Important	Very important	No opinion
More practical information on how to reduce energy consumption at home	○	○	○	○	○	○
Higher energy prices	○	○	○	○	○	○
Better-performing energy efficient appliances (e.g. washing machines, dishwashers)	○	○	○	○	○	○
Reduced cost of energy-efficient devices and renovation (e.g. financial support)	○	○	○	○	○	○

46. To what extent do you support the following potential policy measures?

	Strongly against	Against	Indifferent	Support	Strongly support	Don't know
Providing subsidies to individuals for renovating, purchasing energy-efficient appliances or investing in renewable energy equipment (e.g. rooftop solar panels)	○	○	○	○	○	○
Taxing the use of energy or the purchase of appliances and other equipment that use a lot of energy	○	○	○	○	○	○
Introducing energy efficiency standards for appliances and buildings that manufacturers have to comply with	○	○	○	○	○	○

47. Do you think that low-income households should receive special government support (e.g. subsidies) to help them do this?

1. Yes
2. No
3. Don't know

Example discrete choice experiment:

Please imagine that you have the opportunity to select a new electricity provider for your household if you wish. Below you will be presented with scenarios in which you can choose to switch to a new provider or to stay with your current provider. Please assume that, apart from the differences shown, the providers do not differ in any other way (e.g. regarding the reliability of the electricity supply, etc). Your current provider costs EUR XX/kWh and emits XXg CO_2e/kWh, which are average for [insert country]. The average amount of greenhouse gas emissions emitted per kWh of electricity across all OECD countries is 384g CO2e/kWh.

Given the different options available in each of the following scenarios, please indicate which provider you would choose:

	Provider 1	**Provider 2**	**Current provider**
Change in price per kWh	EUR 0.15/kWh (5% increase)	EUR 0.16/kWh (10% increase)	EUR 0.14/kWh (No change)
Change in amount of greenhouse gas emissions per kWh	397g CO2e/kWh (10% decrease)	309/g CO2e/kWh (30% decrease)	441g CO2e/kWh (No change)
Your chosen provider:	○	○	○

PART D – TRANSPORT

48. Do you or does anyone in your household regularly use any of the following (including company-provided equipment)? *Please select all that apply.*

	Yes, I do	Yes, someone else in the household does	Neither of these	Don't know
Gasoline or diesel-powered scooter/moped	○	○	○	○
Electric scooter/moped	○	○	○	○
Gasoline or diesel-powered motorcycle	○	○	○	○
Electric motorcycle	○	○	○	○
Gasoline or diesel-powered car	○	○	○	○
Hybrid electric car (including plug-in hybrid)	○	○	○	○
Fully electric car	○	○	○	○
Hydrogen fuel cell and other alternative-fueled car (e.g. biofuel, biodiesel)	○	○	○	○
Vehicle sharing program (for scooters, mopeds, motorcycles or cars)	○	○	○	○
Carpooling system	○	○	○	○

[If respondents indicate that the household regularly uses a car in Q48]

49. How old is the newest car that you or other members of your household use?

1. 0-4 years old
2. 5-9 years old
3. 10-14 years old
4. 15 or more years old
5. Don't know

50. Do you or does anyone in your household regularly use any of the following (including company-provided equipment)? *Please select all that apply.*

	Yes, I do	Yes, someone else in the household does	Neither of these	Don't know
Non-electric kick-scooter	○	○	○	○
Electric kick-scooter	○	○	○	○
Non-electric bicycle	○	○	○	○
Electric bicycle	○	○	○	○
Public transport system	○	○	○	○
Kick-scooter sharing programme	○	○	○	○
Bike-sharing programme	○	○	○	○
On-demand ride-hailing application	○	○	○	○

51. Please select which statement best describes the availability of charging stations for electric cars near you:

1. I can charge an electric car in my driveway or in my garage
2. I can charge an electric car at work
3. I can charge an electric car on the street or in the parking lot where I park
4. I can charge an electric car within 3 kilometres/2 miles from my home or my workplace
5. There are no charging stations in my area
6. Don't know

[If respondents indicate that the household does not regularly use a car in Q48]

52. Please rank up to three top reasons from 1 (most important reason) to 3 (third most important reason) why your household does not use a car:

	1	2	3
The purchase cost is too high			
The cost of using it (i.e. maintenance, energy, parking) is too high			
There are public transit services (tram, metro, rail, bus) close to home			
No one in the household can drive (e.g. no driver's license, disability)			
I live in walking/cycling distance from most essential facilities			
Environmental concerns (e.g. outdoor air pollution)			
Road congestion/traffic jams are too inconvenient			
Risk of car accidents			
Too few parking spaces			
None of these			

53. Thinking of your personal travel, how do you usually travel to each of the following activities? Please select your primary mode of transport.

	Walking	Car	Carpooling	Public transport	Bicycle	Motorcycle	Other	Not applicable
Work (e.g. daily commute to and from work, including education)	○	○	○	○	○	○	○	○
Leisure (e.g. visiting family and friends, shopping, sports, cultural activities)	○	○	○	○	○	○	○	○
Travel to drop off/pick up children at school, childcare or other child related travel, if trip does not include a place of work	○	○	○	○	○	○	○	○

54. In a typical year, how often do you make long distance trips (over 100 miles/200km one way) for work-related purposes?

	None	1-3 trips	4-6 trips	7-9 trips	More than 9 trips	Don´t know
Car or motorcycle	○	○	○	○	○	○
Bus	○	○	○	○	○	○
Cruise, ship, ferry	○	○	○	○	○	○
Rail	○	○	○	○	○	○
Carpooling	○	○	○	○	○	○
Plane	○	○	○	○	○	○
Other	○	○	○	○	○	○

55. In a typical year, how often do you make long distance trips (over 100 miles/200km one way) for leisure-related purposes?

	None	1-3 trips	4-6 trips	7-9 trips	More than 9 trips	Don´t know
Car or motorcycle	○	○	○	○	○	○
Bus	○	○	○	○	○	○
Cruise, ship, ferry	○	○	○	○	○	○
Rail	○	○	○	○	○	○
Carpooling	○	○	○	○	○	○
Plane	○	○	○	○	○	○
Other	○	○	○	○	○	○

56. Compared to before the Covid-19 pandemic, how often do you expect to use the following modes of transport once the pandemic is well under control?

	More than before	Slightly more than before	Same as before	Slightly less than before	Less than before	Don't know	I don't expect to do this
For short trips (less than 100 miles/200km one way)							
Use a car individually	○	○	○	○	○	○	○
Carpool	○	○	○	○	○	○	○
Train	○	○	○	○	○	○	○
Bus	○	○	○	○	○	○	○
Plane	○	○	○	○	○	○	○
For long trips (more than 100 miles/200km one way)							
Use a car individually	○	○	○	○	○	○	○
Carpool	○	○	○	○	○	○	○
Train	○	○	○	○	○	○	○
Bus	○	○	○	○	○	○	○
Plane	○	○	○	○	○	○	○

57. To what extent would you support the following policies aiming to reduce environmental impacts from air travel?

	I would be strongly against	I would be against	Indifferent	I would support	I would strongly support	Don't know
A tax on airplane tickets	○	○	○	○	○	○
A tax on kerosene fuel	○	○	○	○	○	○
Investing in research to develop clean air travel technologies (e.g. hydrogen planes, biofuels)	○	○	○	○	○	○
Restricting the number of short-distance flights (less than 1000 km)	○	○	○	○	○	○
Investing in better services for alternative modes of transportation (e.g. train, bus, boat)	○	○	○	○	○	○

58. What do you think about the following actions governments can take to reduce environmental impacts from cars?

Measure	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Don't know/Prefer not to answer
Set stricter fuel efficiency standards for new cars	○	○	○	○	○	○
Implement a tax on carbon emissions or on energy-inefficient vehicles (e.g. a carbon tax)	○	○	○	○	○	○
Charge a fee per kilometre driven	○	○	○	○	○	○
Reduce speed limits on highways	○	○	○	○	○	○
Provide a subsidy (or tax credit) for purchasing a low-emissions or energy-efficient car	○	○	○	○	○	○
Increase parking fees or reduce parking spaces	○	○	○	○	○	○
Improve public transport (e.g. safer, faster, less expensive, better coverage)	○	○	○	○	○	○
More detailed impact labels for cars according to their environmental impacts	○	○	○	○	○	○
Introduce access restrictions or access fees in city centres (e.g. low emission zones)	○	○	○	○	○	○
Promote teleworking	○	○	○	○	○	○

[If respondents indicate that the household regularly uses a car in Q48]

59. Would better public transport services (e.g. more frequent, more accessible, etc.) lead you to use a car less?

1. Yes
2. No
3. Don't know

[IF Q59 == 1]

60. You indicated that better public transport services would lead you to drive car less. Which aspects of public transport would be most important in changing your driving habits?

	Not at all important	Not important	Indifferent	Important	Very important	Don't know
More frequent service	○	○	○	○	○	○
A more extensive network	○	○	○	○	○	○
More comfortable (e.g. cleaner, less crowded)	○	○	○	○	○	○
Safer (e.g. less crime, fewer accidents)	○	○	○	○	○	○
Easier to switch between networks (e.g. metro to bus)	○	○	○	○	○	○
Lower cost	○	○	○	○	○	○
More hygienic (better sanitation protocols)	○	○	○	○	○	○

61. Do you intend to or could you imagine purchasing or leasing a new/used car in the near future (up to two years from now)?

1. Yes, purchasing
2. Yes, leasing
3. No
4. Don't know

62. If you were to purchase or lease a new/used car, which type of car would you be most interested in?

1. Small car (city car or subcompact, Classes A and B)
2. Medium-sized car (compact or medium-sized car, Classes C and D)
3. Large car (Class E)

4. SUV
5. Pick-up truck
6. Van
7. Don´t know

63. If you were to purchase a new car, what do you expect the price range of the vehicle to be?

1. EUR 5-9K {or local currency equivalent}
2. EUR 10-14K {or local currency equivalent}
3. EUR 15-19K {or local currency equivalent}
4. EUR 20-24K {or local currency equivalent}
5. EUR 25-29K {or local currency equivalent}
6. EUR 30-34K {or local currency equivalent}
7. EUR 35-39K {or local currency equivalent}
8. EUR 40-44K {or local currency equivalent}
9. EUR 45-49K {or local currency equivalent}
10. EUR 50-59K {or local currency equivalent}
11. EUR 60-69K {or local currency equivalent}
12. EUR 70K or more {or local currency equivalent}
13. I don't know

64. If you were to purchase or lease a new or used car, which fuel type would you be most interested in?

1. Gasoline
2. Diesel
3. Autogas (LPG), compressed natural gas (CNG), liquefied natural gas (LNG)
4. Hybrid
5. Plug-in Hybrid
6. Battery electric
7. Hydrogen
8. Other
9. Don't know

Example discrete choice experiment:

Please imagine that you are purchasing or leasing a new/used vehicle. Apart from the characteristics described below, the vehicles are the same in all other ways (e.g. comfort, safety, etc). Please choose which vehicle you would buy/lease:

	Vehicle 1	Vehicle 2	Vehicle 3
Drivetrain	Battery electric	Plug-in hybrid	Respondent-specific status quo (Q64)
Monthly ownership cost (paid over five years)	+25% of respondent-specific reference price	+20% of respondent-specific reference price	Respondent-specific reference price (Q63)
Running cost	3 €/100km	8 €/100km	Based on Q63
Driving range	400 km / 250 miles	800 km / 500 miles	Based on Q63
Highway refueling/recharging time	20 minutes (to 80% charge)	5 min (refuel)	Based on Q63
Can be charged at home	Yes	Yes	Based on Q51
Your chosen vehicle:	○	○	○

PART E – WASTE

In this section we will ask you about your waste disposal habits. Please note that by recyclable waste, we mean waste and materials that can be processed and used again, such as recyclable plastic bottles, paper, cardboard, glass and recyclable metal.

65. On average, how many of the following bags/bins of mixed waste (i.e. non-recyclable and non-compostable waste) does your household generate each week?

0	Less than 1	1	2	3	4	5	6	7	8	9	10 or more	Don't know
○	○	○	○	○	○	○	○	○	○	○	○	○

66. How do you dispose of your mixed (non-recyclable, non-compostable) waste? *Please select your primary method of disposal:*

1. Mixed waste is collected directly from my residence.
2. I dispose of my mixed waste in containers located in my building/neighbourhood.
3. I dispose of my mixed waste at a landfill, incinerator, or drop-off location.
4. Other

67. How is your household charged for the collection of mixed (non-recyclable, non-compostable) waste at your primary residence? *Please select the most relevant option:*

1. **Flat fee** (e.g. lump sum included in property taxes, charges or rent)
2. According to **volume** (e.g. per bag, per container, bag tags)
3. According to **weight** (e.g. per kg, pound)
4. According to **frequency** of collection (e.g. how often the waste is collected)
5. According to size of household or residence
6. Other form of charging
7. Not charged
8. Don't know

68. On average, how many of the following bags/bins of recyclable waste does your household generate each week (not including compostable waste)?

0	Less than 1	1	2	3	4	5	6	7	8	9	10 or more	Don't know
○	○	○	○	○	○	○	○	○	○	○	○	○

69. What is the main waste collection service you use to dispose of the following?

	Door-to-door/curb side collection	Drop-off centres /containers	Bring to a store/retailer/ manufacturer/ farmers market	Other	No recycling service available	I don't know what collection service exists in my area	I don't produce this type of waste
Glass bottles/ containers	○	○	○	○	○	○	○
Plastic bottles/ containers	○	○	○	○	○	○	○
Plastic packaging other than bottles/containers	○	○	○	○	○	○	○
Aluminium, tin and steel cans	○	○	○	○	○	○	○
Paper/cardboard (including paper-based packaging)	○	○	○	○	○	○	○
Batteries	○	○	○	○	○	○	○
Food waste (for composting)	○	○	○	○	○	○	○

70. Please indicate approximately what percentage of each the following items your household recycles or composts:

	<10%	25%	50%	75%	>90%	Don't know	I don't recycle/compost these items
Glass bottles/ containers	○	○	○	○	○	○	○
Plastic bottles/ containers	○	○	○	○	○	○	○
Other recyclable plastics packaging	○	○	○	○	○	○	○
Aluminium, tin and steel cans	○	○	○	○	○	○	○
Paper/cardboard (including paper-based packaging)	○	○	○	○	○	○	○
Batteries	○	○	○	○	○	○	○
Electronics/electric equipment	○	○	○	○	○	○	○
Food waste (for composting)	○	○	○	○	○	○	○

[If respondent indicates composting at least <10% of food waste in Q70]

71. Do you compost your food waste at home or in a collective facility?

1. At home
2. In a collective facility (e.g. it is brought to a composting site)

[If Q69h == <10% OR If Q69h == 25% OR If Q69h == 50%]

72. What are the main reasons you do not compost more? *Please select all that apply:*

1. I don't have enough knowledge on the topic
2. There is not enough storage space at home
3. There are no available space in collective specialized facilities near my home
4. I don't see the benefits of doing it
5. It requires too much organisation
6. It can be unpleasant (e.g. smells, attracts insects)
7. Compost collection services are too expensive
8. Other
9. Don't know

73. Please rank up to three most important factors from 1 (most important) to 3 (third most important) that would encourage your household to recycle or compost more.

	Rank
More practical information on how to do it	
Greater financial incentives (e.g. saving/receiving money)	
More space at home for recycling/composting	
Simpler requirements for recycling (e.g. less sorting needed)	
More accessible collection or drop-off services	
More frequent collection of recyclable/compostable items	
Better evidence of the environmental benefits of recycling	
Recyclable waste collected from my primary residence	
Cleaner containers to use for recycling/composting	
Having the option to get recyclable/compostable waste collected from my home	

74. How often does your household do the following?

	Never	Occasionally	Often	Always	Don't know	Not applicable
Buy paper with recycled content	○	○	○	○	○	○
Buy products that are less environmentally harmful (e.g. cleaning products)	○	○	○	○	○	○
Use refillable containers	○	○	○	○	○	○
Use reusable shopping bags	○	○	○	○	○	○
Rent or borrow products (e.g. home improvement tools) instead of buying them	○	○	○	○	○	○
Make homemade products (e.g. beauty or cleaning products)	○	○	○	○	○	○
Buy second-hand	○	○	○	○	○	○
Buy high quality items that will last	○	○	○	○	○	○
Repair damaged items instead of buying new ones	○	○	○	○	○	○

75. In general, how do you dispose of old or broken electronic and electric equipment? *Please select all that apply:*

1. Store at home/store indefinitely
2. Dispose of with mixed waste
3. Get old equipment taken away by the retailer when new replacement equipment is delivered
4. Return old equipment at the shop where I have bought new equipment
5. Use specialised disposal/collection service
6. Give to charity
7. They are collected with my recyclables
8. Resell for parts use or refurbishment
9. Other

76. Approximately how much did the volume of mixed (non-recyclable, non-compostable) waste your household produces change as a result of the Covid-19 pandemic?

Decreased by 50% or more	0% (no change)	Increased by 50% or more	Don't know
	--	--		□

77. Approximately how much did the volume of recyclable and compostable waste your household produces change as a result of the Covid-19 pandemic?

Decreased by 50% or more	0% (no change)	Increased by 50% or more	Don't know
	--	--		□

78. What type of food does your household usually throw away? Please exclude non-edible parts of food, e.g. peelings, apple cores, etc. *Please select all that apply:*

1. Fruits/vegetables
2. Bread
3. Meat/seafood
4. Dairy/eggs
5. Packaged foods meant to be stored outside the fridge (like cereal, cookies, canned vegetables, etc.)
6. Leftovers from homemade meals
7. My household never throws away food

[Skip if Q78 == 7]

79. How often do you throw away (e.g., discard in the trash, garbage disposal, compost, etc.) food for the following reasons?

	Never	Rarely	Sometimes	Often	Always
Past date on label	○	○	○	○	○
Spoiled	○	○	○	○	○
Didn't like or tired of eating	○	○	○	○	○
Did not know what to do with it or how to use it	○	○	○	○	○
Too little to save	○	○	○	○	○
Not good as leftovers	○	○	○	○	○
Unable to store or save	○	○	○	○	○
Other	○	○	○	○	○

[IF Q79b ≠ Never]

80. You indicated that you throw food away because it spoils. What typically happens that leads your food to spoil? *Please select all that apply:*

1. Bought too much
2. Made too much
3. Lost track of in the fridge or cupboard
4. Too busy to prepare the food
5. Did not know what to do with or how to use
6. Other

[Skip if respondent answered Q78 == 7]

81. What information, if any, would be helpful in reducing the amount of food your household throws away? *Please select all that apply:*

1. How to store specific items
2. How to interpret food date labels (use by, sell by, etc.)
3. What can be frozen and for how long
4. What foods are dangerous when spoiled versus simply unappealing
5. Recipes to help use up extra food
6. Planning shopping or portions (e.g. using specialized tools or apps)
7. Don't know

Example discrete choice experiment:

Please imagine that you are purchasing laundry detergent. The detergent can be bought in either a non-recyclable container that you can dispose of after use, a recyclable container that you can recycle after use, or a refillable container that you can re-use. You pay a one-time deposit for the refillable container and for subsequent purchases you only pay for the detergent that you fill it with. Please keep in mind that using a refillable container requires bringing the empty container to the store and cleaning it after each use. Apart from the characteristics described below, the detergents are the same in all ways (e.g. effectiveness, ingredients, smell). The detergent can be either in liquid form or in solid form. Given the options below, please select which product you would buy:

	Detergent 1	Detergent 2	Detergent 3
Price	4.50 €	4.00 €	3.50 €
Package type	Cardboard package	Plastic package	Reusable container
Your chosen detergent:	○	○	○

PART F – FOOD SYSTEMS

82. Where does your food typically come from?

	Never	Sometimes	Often	Always
Large supermarkets	○	○	○	○
Local supermarket/convenience stores	○	○	○	○
Online groceries	○	○	○	○
Local food shops (e.g. bakeries, butcheries, fruit and vegetable shops)	○	○	○	○
Markets (e.g. outdoor flea markets, covered markets)	○	○	○	○
Directly from the producers/cooperatives	○	○	○	○
Eat out	○	○	○	○
Order food to go or for delivery	○	○	○	○
Food-sharing schemes (e.g. food banks or donation centres)	○	○	○	○

84. How often do you personally do the following?

	Never	Once a month	Once a week	Several times a week
Eat red meat (e.g. beef)	○	○	○	○
Eat white meat (e.g. chicken)	○	○	○	○
Eat seafood	○	○	○	○
Eat dairy products (e.g. milk, cheese)	○	○	○	○
Eat eggs	○	○	○	○
Eat locally produced food	○	○	○	○
Eat fair trade certified products	○	○	○	○
Eat processed snacks and pre-prepared meals	○	○	○	○
Have to make compromises on food quality or quantity because of a lack of money	○	○	○	○
Have to make compromises on food quality or quantity because of a lack of food availability (e.g. lack of stores/restaurants in the area)	○	○	○	○

85. How often do you personally do the following?

	Never	Rarely	Sometimes	Often	Always
Prioritise food products with minimal packaging	○	○	○	○	○
Eat mainly products that are in season	○	○	○	○	○
Eat organic food	○	○	○	○	○

86. Compared to before the Covid-19 pandemic, how often do you expect to do the following once the Covid-19 pandemic is well under control?

	Less than before	Slightly less than before	Same as before	Slightly more than before	More than before	Don't know	I don't expect to do this
Eat processed snacks and pre-prepared meals	○	○	○	○	○	○	○
Buy food at large supermarkets	○	○	○	○	○	○	○
Buy groceries online	○	○	○	○	○	○	○
Buy food from local food shops (e.g. bakeries, butcheries, fruit and vegetable shops)	○	○	○	○	○	○	○
Buy food from markets (e.g. outdoor markets, covered markets)	○	○	○	○	○	○	○
Buy directly from the producers/cooperatives	○	○	○	○	○	○	○
Receive items from food-sharing schemes (e.g. food banks or donation centres)	○	○	○	○	○	○	○
Contribute items to food-sharing schemes (e.g. food banks or donation centres)	○	○	○	○	○	○	○
Eat out	○	○	○	○	○	○	○
Order food to go or for delivery	○	○	○	○	○	○	○

87. What is most important to you when you are choosing which foods to buy? *Please select up to five of the following:*

It is easy to prepare	○
It tastes good	○
It is healthy	○
It emits relatively few emissions that contribute to climate change	○
It is affordable	○
It can be easily bought or is widely accessible	○
It is made and sold by people who have good working conditions	○
It is produced in a way that respects animal welfare	○
It is organic	○
It is unprocessed	○
It is produced locally	○
It is sold with minimal packaging	○
It is not easily perishable	○
It is fresh	○

88. What do you think of the following measures to improve the environmental sustainability of food systems?

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Don't know
Improve the design and use of sustainability labels	○	○	○	○	○	○
Place stricter regulations on the use of pesticides, industrial farming and aquaculture operations	○	○	○	○	○	○
Put a tax on meat and/or seafood	○	○	○	○	○	○

Provide incentives to farmers to convert to more environmentally-friendly agricultural practices	○	○	○	○	○	○
Limit advertising for food products with large environmental impacts	○	○	○	○	○	○
Educate school children about sustainable diets	○	○	○	○	○	○
Promote food banks or food-sharing platforms (such as phone apps) that enable people to donate or collect food for free	○	○	○	○	○	○
Make food companies pay for or take back their packaging for proper disposal	○	○	○	○	○	○
Provide incentives for restaurants to use sustainable products	○	○	○	○	○	○

[If respondents eat meat as indicated by Q83]

89. If available in the future, would you be willing to substitute conventional meat with lab-grown meat? (Lab-grown meat is made from animal cells in a laboratory and not from a slaughtered animal).

1. Yes
2. No
3. Don't know

[If Q88 == 2]

90. Why would you be reluctant to eat lab-grown meat? *Please select all that apply:*

1. Too expensive
2. Inferior taste or nutritional value
3. Incompatible with my culture and/or values
4. I don't think it would be available for me to buy
5. I am suspicious of lab-grown alternatives (e.g. health impacts)
6. Other

Example discrete choice experiment:

Please imagine that you wish to select a plate of food from several options as your typical meal. Each plate has one portion of vegetables, one portion of grains, and one portion of protein, as shown below. Apart from the differences described below, the quality of the ingredients in each of the meals is the same, and all of the meals contain the same number of calories. Given the following options, please choose which plate you would buy:
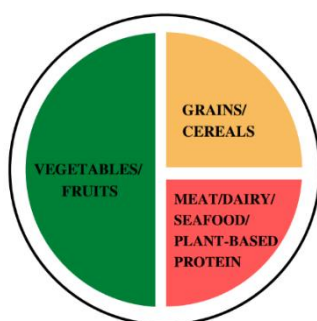
	Plate 1	Plate 2	
Price	€ 10.50	€ 8.75	**Neither**
Protein source	Seafood	Meat	
Chemical/antibiotic use	None	High use	
Source	National	Local	
Your chosen plate:	○	○	○

References

Bateman, I. et al. (2002), "Economic valuation with stated preference techniques: a manual.", *Economic valuation with stated preference techniques: a manual.*. [2]

OECD (2018), *Cost-Benefit Analysis and the Environment: Further Developments and Policy Use*, OECD Publishing, Paris, https://doi.org/10.1787/9789264085169-en. [1]

Annex B. Survey methodology and sample statistics

Survey implementation

Timeline and selection of survey provider

In 2008 and 2011, the OECD carried out cross-country household surveys designed to shed light on environmental behaviours in the domains of energy, waste, transport and food, as well as on how government policies affect these behaviours (OECD, 2013[1]; OECD, 2011[2]). The third round of the survey on Environmental Policy and Individual Behaviour Change (EPIC) was implemented in 2022 in nine countries: Belgium, Canada, France, Israel, the Netherlands, Sweden, Switzerland, the United Kingdom and the United States. Details on the project timeline are provided in Table A B.1.

Table A B.1. Project timeline

Activity	Timeframe
OECD questionnaire design, with inputs from the advisory committee and steering group	April 2021 – March 2022
Call for tender and selection of survey provider	July - December 2021
Translations	March – April 2022
Pilot 1 (60 respondents per country)	April 2022
Pilot 2 (60 respondents per country)	May 2022
Full implementation of the OECD EPIC survey in 9 countries	June-July 2022

In June and July 2022, 1 800 households were surveyed in each of the nine participating countries using an internet-based questionnaire.[1] Due to length constraints, respondents were randomly assigned to complete two of the four thematic sections in addition to the sections on household characteristics and environmental attitudes, which were completed by every household. This resulted in 900 observations per thematic domain per country (1 635 in the United States) and a total targeted sample of 8 835 observations in each of the four thematic areas: residential energy use, waste generation and recycling, personal transport choices and food consumption (Table A B.2).

Table A B.2. Targeted sample sizes

	Section A: Socio-demographics	Section B: Environmental Attitudes	Section C: Energy	Section D: Transport	Section E: Waste	Section F: Food
Per country (except US)	1 800	1 800	900	900	900	900
United States	3 270	3 270	1 635	1 635	1 635	1 635
Total	**17 670**	**17 670**	**8 835**	**8 835**	**8 835**	**8 835**

Selection of survey provider

The OECD released a Call for Tender to select a survey provider specialised in the implementation of large international web-surveys using online consumer panels in different countries. As in previous rounds of the survey, an internet-based survey was preferred due to lower cost per respondent and ease of implementation across multiple OECD countries. Survey providers were assessed based on their demonstrated ability to obtain a representative sample with the assessment criteria focusing on panel size, panel quotas, panel recruitment and management, experience with discrete choice experiments, online survey design abilities, responsiveness and value for money. Based on these criteria, the OECD selected Ipsos N.V. to implement the survey. The tasks performed by the survey provider included hosting and programming the online questionnaire, recruiting a nationally-representative sample of respondents from established online panel members, and collecting and cleaning the data.

Questionnaire design and pilot testing

The 2022 OECD EPIC survey questionnaire is composed of six sections. Two sections elicit socio-demographic and attitudinal characteristics, and four sections elicit information regarding household behaviour in the environmental areas of interest: waste generation and recycling, personal transport choices, residential energy use and food consumption. The questionnaire is composed of approximately 90 closed questions with a combination of binary, ordinal and Likert scale questions. Each of the four thematic sections also includes a discrete choice experiment.

The questionnaire was developed based on previous questionnaires and with the input from a Steering Group, a Scientific Advisory Committee, and an Internal Coordination Group. The Steering Group was composed of government representatives from the countries involved in the survey, the Scientific Advisory Committee included subject matter and methodological experts from academia, and the Internal Coordination Group involved other relevant OECD parties, specifically the Trade and Agriculture Directorate, the International Energy Agency and the International Transport Forum.

Although some continuity exists in survey questions with respect to previous rounds of the survey,[2] changes were made to the 2022 version of the survey in order to account for evolution in environmental, economic, and political context over the past ten years. Questions about satisfaction with the local environment as well as importance of green space were included in the section on attitudes. More questions in the energy section focused on consumption reducing behaviour while the discrete choice experiment (DCE) asked about renewable energy which was the focus of previous survey rounds. The transport section, for example, added questions on electric vehicles as well as other transport options such as bikes and scooters. The waste section now includes questions on composting, electronic equipment and food waste as well as payment schemes for waste collection. The section on food systems was broadened in scope to include a variety of food consumption habits beyond organic food. In order to reduce cognitive burden, questions were simplified and shortened when possible.

The inclusion of discrete choice experiments is an important methodological novelty in the 2022 round of the survey. In DCEs, subjects are asked to make hypothetical choices by selecting a preferred alternative among a menu of options (Bateman et al., 2002[3]; OECD, 2018[4]). Stated preference data generated by discrete choice experiments allows for an estimation of how much respondents value the various characteristics of the alternatives presented. These characteristics could pertain to products (e.g. the price or GHG emissions of energy supply), actions (e.g. convenience of using disposable vs. refillable containers) or elements directly impacted by environmental policies (e.g. the cost and convenience of owning an electric vehicle).

The DCEs were also designed with input from the Steering Group, Scientific Advisory Committee, Internal Coordination Group, as well as leading researchers in choice modelling. Details regarding each experiment are provided in each thematic section. The general methodology followed in the design of the DCEs was

the same across thematic sections. The first step in designing the DCEs was to characterize clearly the decision problem including the scope of potential changes in attributes and the types of values that are associated with these changes. Next, attributes and attribute levels were selected based on their credibility, ease of comprehension, and estimation properties. Where applicable, attribute levels are country- or respondent-specific to ensure realistic scenarios.

Pilot studies were implemented prior to fielding the survey in order to test the appropriateness of the selected attributes and their levels, as well as to ensure that the variation of attribute levels was adequate for identifying preference parameters in the choice model. Once the attributes, levels and number of alternatives were determined, statistical design theory was used to combine levels of the attributes into choice sets. An orthogonal fractional factorial design was used to determine the combination of attribute levels that appeared in the choice sets for the first pilot study. The preference parameters estimated from the pilot data were then used as prior estimates to inform a statistically efficient (D-efficient) design based on the predicted standard errors of parameter estimates. If any information on priors is known, these types of designs always outperform orthogonal designs (ChoiceMetrics, 2018[5]). To increase the robustness of the design to the misspecification of priors, a Bayesian efficient design specifying parameter distributions, rather than point estimates, was also employed. In addition to D-efficiency, attribute balance was an important criterion that was maintained in the design of the choice sets. When more than six choice scenarios were required in order to identify the econometric model, questions were blocked into groups so and randomly assigned to respondents so that each respondent saw six scenarios per thematic area.

A first pilot survey of 540 respondents run in April 2022 was used to refine the questionnaire. The pilot study was implemented in all participating countries and allowed for the identification of difficult questions based on the average completion time required per item. The responses from discrete choice experiments were used to optimise the choice sets for the second pilot study. The second pilot was implemented in May 2022. Additional changes made to the questionnaire following the second pilot study included further refinements to the choice sets based on updated preference parameter estimates as well as revisions to further improve readability of complex .

Survey technology and translation

The online questionnaires were programmed such that they could be completed standard web browsers on a variety of devices, including cell phones. The platform permitted a variety of response formats for different questions. For example, respondents could use a sliding bar to indicate how likely they thought specific events were, or how much they would support a given policy. The target median completion time for the online survey was approximately 20 minutes. Once the online questionnaire was programmed in British English, it was translated into Dutch, French, Swedish, Spanish, Italian, German, Hebrew and Arabic, with 15 distinct versions created once country-specific vocabulary (e.g., American and Canadian English versions), currencies and systems of measurement were taken into account. Members of the Steering Group were invited to conduct final checks on the translated questionnaires.

Respondent targeting, recruitment and quota sampling

The target sample consists of the general public aged 18 or over who had either full or partial responsibility for household expenses (such as utility bills or car and appliance purchases). Respondents were recruited from Ipsos' in-country non-probability/volunteer online access panels based on their profile data (age, gender and region) and pre-defined sub-sample size. To ensure representativeness in the sample, quotas were set for age, gender, geographic region and income (see section below for how quota targets were set). When quotas were filled, respondents with these characteristics were stopped from completing the questionnaire. Panellists who were selected on the basis of these characteristics received e-mails inviting them to respond to the survey. No mention was made of the topics addressed in the questionnaire. To promote participation in the survey, panel members receive reward points for participating in a survey. The

number of points allocated to each survey varies according to a number of factors, notably the length and complexity of the questionnaire. Potential respondents who started the questionnaire were asked whether they met the screening criteria (influential in household financial decisions). If they did not meet the criteria, they were thanked for their time and screened out of the sample. Despite rigorous efforts at stratification and quota sampling, it is important to acknowledge that there may be some respondent characteristics that were not observed and which correlate with internet use. This correlation of unobserved characteristics could introduce a selection bias in the sample. It is therefore recommended that researchers drawing conclusions from these data carefully consider how this selection bias based on internet use could affect their results.

Quality Control

Interview quality was closely monitored during the fieldwork. Completed interviews were checked for speeders, straight liners, and item non-response. Speeders were defined as respondents who completed a given section in less than half of the median survey length of that section. If respondents were flagged for at least two of the three quality checks, they were removed from the final dataset. Table A B.3 describes the screening process carried out by the survey provider.

Table A B.3. Number of interviews classified as bad quality during fieldwork

Bad quality surveys	
Speeder	2 555
Straight-lining	863
Non-response	128
Bad quality (respondents flagged on at least on 2 of the above)	300

The OECD carried out a further quality control of the data based on a speeding criteria only, excluding an additional 506 respondents, or 2.8% of the remaining sample. These respondents completed the survey sections in less than one third of section- and country-specific median completion times. The total final sample size is 17 216 respondents.

Response times and drop-out rates

Table A B.4 shows the drop-out rates by country. The drop-out rate is calculated as the fraction of respondents who started the questionnaire but then did not complete it. Potential respondents who were removed because of quotas or were screened out of the questionnaire after the screening question are not included in the calculation.[3] The overall drop-out rate was 26%.

Table A B.4. Screened, drop-outs and completed surveys by country

	Screened out		Abandoned the survey	Completed surveys	Drop-out rate
	Out of target	Out of quota			
Total	1 837	6 180	6 138	17 722	25.7%
Belgium	179	377	412	1 807	18.6%
Canada	212	414	503	1 805	21.8%
France	157	755	464	1 804	20.5%
Netherlands	125	568	703	1 803	28.1%
Israel	361	1 365	1 037	1 805	36.5%
Sweden	153	823	741	1 805	29.1%
Switzerland	204	1 029	548	1 804	23.3%
UK	129	522	721	1 802	28.6%
US	317	327	1 009	3 287	23.5%

Note: The drop-out rate is calculated as: (Abandoned the survey)/(Abandoned the survey + Completed).

Quota targets and weighted sample statistics

To ensure a representative sample and avoid sample bias, the sample was stratified by income, age, gender and region in each of the nine countries. Sample quotas were established based on population data from official statistic sources.[4] Income was stratified by after-tax income quintiles. Age was stratified using the following groups: 18-24, 25-34, 35-44, 45-54 and 55 years and over. Gender was approximately half male and half female, with slightly more females in some countries. Region was stratified by as few as four regions in the Netherlands and Belgium and over 12 for the UK and France. The survey allowed for the collection of a unique dataset of more than 17 670 households in nine countries.

To correct the imbalances between the targets on age, gender, region and income, weighting factors were calculated to ensure representativeness at the population level. Post-stratification weights were calculated on a country-by-country basis based on age, gender, region and income variables. For respondents who did not report income (approximately 11% of the sample), income was imputed using a multinomial logit model. Table A B.5 compares weighted sample proportions to target sample proportions.

Table A B.5. Quota targets relative to weighted sample

BELGIUM	Target	Weighted sample
Gender[1]		
Man	49%	48%
Woman	51%	51%
Age		
18-24	10%	10%
25-34	16%	16%
35-44	16%	16%
45-54	17%	17%
55+	41%	41%
Monthly household income		
EUR 0-1 399	20%	18%
EUR 1 400-1 899	20%	18%
EUR 1 900-2 349	20%	19%
EUR 2 350-2 949	20%	18%
Over EUR 2 950	20%	15%
Don't know		2%
Prefer not to answer		10%
Region		
Brussels	10%	10%
Flanders	58%	58%
Wallonia	32%	32%
CANADA	**Target**	**Weighted sample**
Gender		
Man	49%	49%
Woman	51%	50%
Age		
18-24	10%	11%
25-34	16%	17%
35-44	16%	17%
45-54	17%	16%
55+	41%	40%
Monthly household income		
CAD 0-2 083	20%	18%
CAD 2 084-3 333	20%	18%

	Target	Weighted sample
CAD 3 334-5 000	20%	19%
CAD 5 001-6 667	20%	19%
Over CAD 6 668	20%	17%
Don't know		2%
Prefer not to answer		7%
Region		
Alberta	12%	12%
British Columbia	14%	14%
Manitoba	4%	4%
Newfoundland and Labrador	1%	1%
Nova Scotia	3%	3%
Ontario	40%	40%
Prince Edward Island	0%	0%
Quebec	23%	23%
Saskatchewan	3%	3%
Yukon	0%	0%
Northwest territories	0%	0%
Nunavut	0%	0%
FRANCE	**Target**	**Weighted sample**
Gender		
Man	48%	46%
Woman	52%	53%
Age		
18-24	14%	14%
25-34	14%	14%
35-44	15%	15%
45-54	16%	16%
55+	40%	40%
Monthly household income		
EUR 0-1 250	20%	18%
EUR 1 250-1 649	20%	19%
EUR 1 650-1 999	20%	20%
EUR 2 000-2 649	20%	18%
Over EUR 2 650	20%	18%
Don't know		1%
Prefer not to answer		7%
Region		
Île-de-France	18%	18%
Centre - Val de Loire	4%	4%
Bourgogne -Franche-Comté	4%	4%
Normandie	5%	5%
Hauts-de-France	9%	9%
Grand Est	9%	9%
Pays de la Loire	6%	6%
Bretagne	5%	5%
Nouvelle-Aquitaine	9%	10%
Occitanie	9%	9%
Auvergne-Rhône-Alpes	12%	12%
Provence-Alpes-Côte d'Azur	8%	8%
Corse	1%	1%
ISRAEL	**Target**	**Weighted sample**
Gender		
Man	48%	48%

Woman	52%	52%
Age		
18-24	21%	21%
25-34	19%	18%
35-44	17%	17%
45-54	15%	15%
55+	29%	29%
Monthly household income		
NIS 0-5 970	20%	17%
NIS 5 970-10 705	20%	18%
NIS 10 706-15 966	20%	19%
NIS 15 967-22 722	20%	18%
Over NIS 22 723	20%	18%
Don't know		2%
Prefer not to answer		8%
Region		
Central	26%	26%
Haifa	13%	13%
Jerusalem	11%	11%
Northern	17%	17%
Southern	14%	14%
Tel Aviv	19%	19%
NETHERLANDS	**Target**	**Weighted sample**
Gender		
Man	49%	49%
Woman	51%	50%
Age		
18-24	15%	15%
25-34	15%	15%
35-44	14%	14%
45-54	17%	17%
55+	39%	39%
Monthly household income		
EUR 0-1 450	20%	18%
EUR 1 450-1 899	20%	18%
EUR 1 900-2 399	20%	18%
EUR 2 400-3 049	20%	18%
Over EUR 3 050	20%	16%
Don't know		3%
Prefer not to answer		10%
Region		
North Netherlands	10%	10%
East Netherlands	21%	21%
West Netherlands	48%	48%
South Netherlands	22%	21%
SWEDEN	**Target**	**Weighted sample**
Gender		
Man	50%	50%
Woman	50%	49%
Age		
18-24	14%	14%
25-34	17%	17%
35-44	15%	15%
45-54	16%	16%

55+	38%	38%
Monthly household income		
SEK 0-14 050	20%	19%
SEK 14 050-19 299	20%	19%
SEK 19 300-24 399	20%	19%
SEK 24 400-31 049	20%	18%
Over SEK 31 050	20%	17%
Don't know		2%
Prefer not to answer		6%
Region		
Stockholm	23%	23%
Oestra Mellansverige	17%	17%
Sydsverige	15%	15%
Norra Mellansverige	8%	8%
Mellersta Norrland	4%	4%
Oevre Norrland	5%	5%
Smaaland med Oearna	8%	8%
Vaestsverige	20%	20%
SWITZERLAND	**Target**	**Weighted sample**
Gender		
Man	49%	49%
Woman	51%	51%
Age		
18-24	12%	12%
25-34	16%	16%
35-44	17%	17%
45-54	17%	17%
55+	38%	38%
Monthly household income		
CHF 0-2 706	20%	17%
CHF 2 706-3 576	20%	19%
CHF 3 577-4 599	20%	18%
CHF 4 600-6 132	20%	17%
Over CHF 6 133	20%	16%
Don't know		2%
Prefer not to answer		11%
Region		
Région lémanique	19%	19%
Espace Mittelland	22%	22%
Nordwestschweiz	14%	14%
Zürich	18%	18%
Ostschweiz	14%	14%
Zentralschweiz	10%	9%
Ticino	4%	4%
UNITED KINGDOM	**Target**	**Weighted sample**
Gender		
Man	49%	47%
Woman	51%	52%
Age		
18-24	14%	14%
25-34	16%	16%
35-44	15%	15%
45-54	16%	16%

|	Target	Weighted sample
55+	38%	38%
Monthly household income		
GBP 0-950	20%	18%
GBP 950-1 249	20%	18%
GBP 1 250-1 649	20%	18%
GBP 1 650-2 249	20%	17%
Over GBP 2 250	20%	16%
Don't know		2%
Prefer not to answer		10%
Region		
North East	4%	4%
North West	11%	11%
Yorkshire and Humberside	8%	8%
West Midlands	9%	9%
East Midlands	7%	7%
East Anglia	9%	9%
South West	8%	8%
South East	14%	14%
Greater London	15%	14%
Wales	5%	5%
Scotland	8%	8%
Northern Ireland	3%	3%
UNITED STATES	**Target**	**Weighted sample**
Gender		
Man	49%	47%
Woman	51%	51%
Age		
18-24	16%	16%
25-34	17%	17%
35-44	16%	16%
45-54	15%	15%
55+	36%	36%
Monthly household income		
USD 0-2 803	20%	17%
USD 2 803-4 167	20%	19%
USD 4 168-8 333	20%	19%
USD 8 334-16 667	20%	20%
Over USD 16 668	20%	18%
Don't know		3%
Prefer not to answer		4%
Region		
New England	5%	5%
Middle Atlantic	13%	13%
East North Central	14%	14%
West North Central	6%	6%
South Atlantic	20%	20%
East South	6%	6%
West South	12%	12%
Mountain	8%	8%
Pacific	17%	17%

1. The weighted sample proportions do not sum to 100 because respondents also had the option to respond "other" and "prefer not to say."

Country-level sociodemographic characteristics not used for quota sampling

Figure A B.1. Residential location

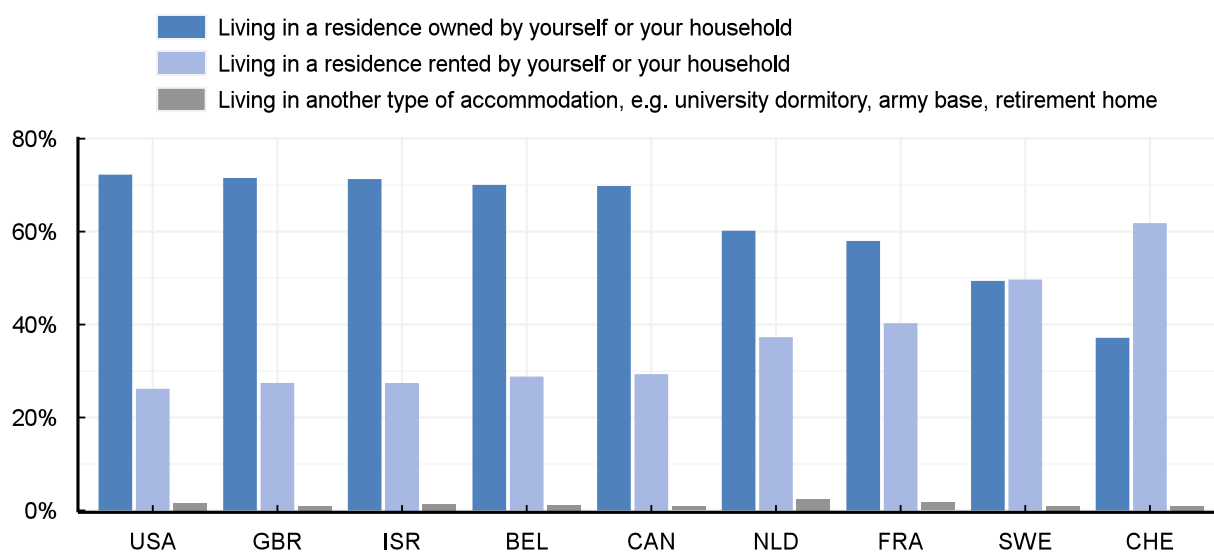Proportion of the sample living in different area types
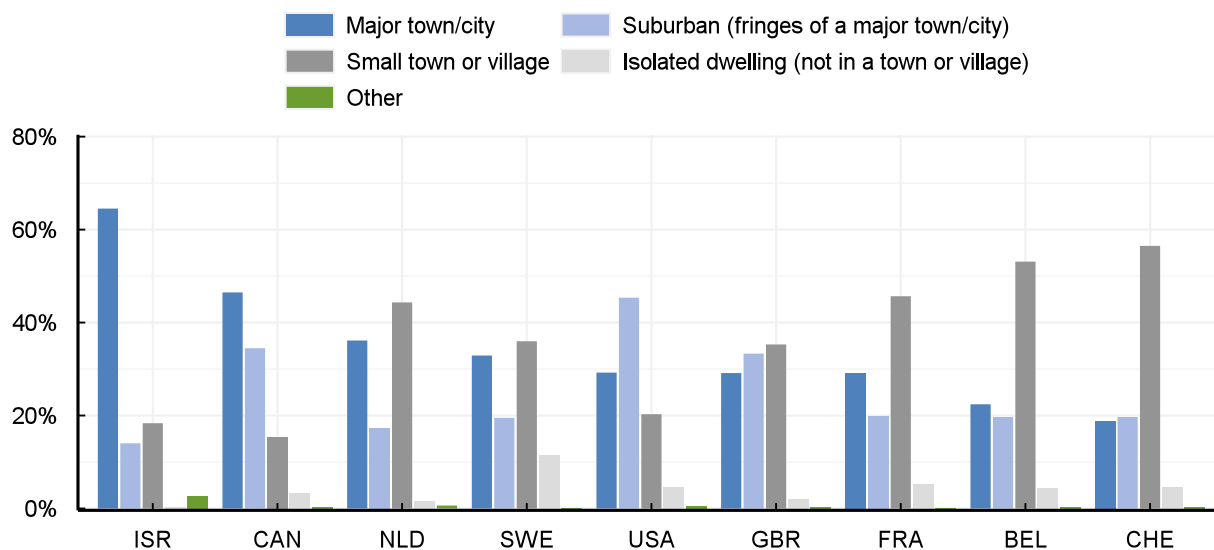
Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ⌗⌗⌗ https://stat.link/j9z72f

Figure A B.2. Residential status

Proportion of the sample living in different dwelling types

Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.
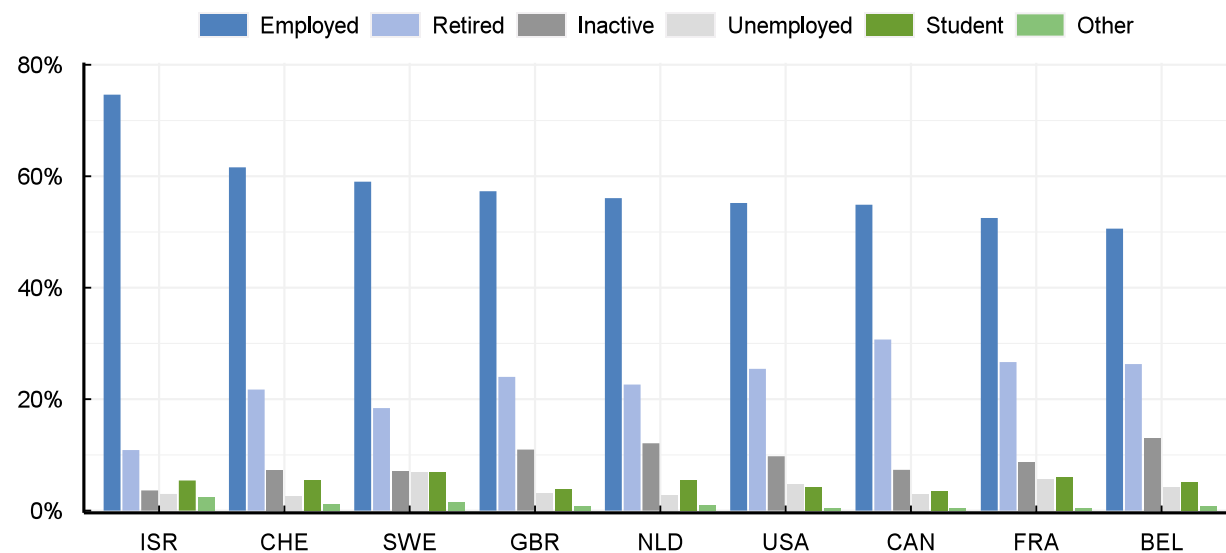
StatLink ⌗⌗⌗ https://stat.link/ljpyo7

Table A B.6. Education

Proportion of the population reporting having achieved higher education

Country	Higher education
BEL	47%
CAN	41%
CHE	24%
FRA	31%
GBR	54%
ISR	48%
NLD	44%
SWE	33%
USA	47%

Figure A B.3. Employment

Proportion of the sample per employment status

Source: OECD (2022), Environmental Policies and Individual Behaviour Change Survey.

StatLink ▦▤ https://stat.link/4n780h

References

Bateman, I. et al. (2002), "Economic valuation with stated preference techniques: a manual.", *Economic valuation with stated preference techniques: a manual.*. [3]

ChoiceMetrics (2018), "Ngene 1.2 User Manual and Reference Guide", http://www.choice-metrics.com (accessed on 5 August 2022). [5]

OECD (2018), *Cost-Benefit Analysis and the Environment Further Developments and Policy Use: PART I Discrete choice experiments*, https://www.oecd-ilibrary.org/environment/cost-benefit-analysis-and-the-environment/discrete-choice-experiments_9789264085169-8-en (accessed on 17 February 2020). [4]

OECD (2013), *Greening Household Behaviour: Overview from the 2011 Survey*, OECD Studies on Environmental Policy and Household Behaviour, OECD Publishing, Paris, https://doi.org/10.1787/9789264181373-en. [1]

OECD (2011), *Greening Household Behaviour: The Role of Public Policy*, OECD Studies on Environmental Policy and Household Behaviour, OECD Publishing, Paris, https://doi.org/10.1787/9789264096875-en. [2]

Notes

[1] 3 270 households were surveyed in the United States.

[2] Note that samples differ across survey rounds.

[3] The drop-out rate is calculated as the proportion of those who passed the screening question and began the survey, but left before it was completed.

[4] Eurostat 2020, American Community Survey (ACS), Statistics Canada Population estimates, 20-07421901 NATO Public Opinion MENA.

OECD Studies on Environmental Policy and Household Behaviour

How Green is Household Behaviour?

SUSTAINABLE CHOICES IN A TIME OF INTERLOCKING CRISES

Household choices – such as what to eat, how to get to work and how to heat our homes – have significant implications for the environment. With the urgency of environmental action and the need to shift to more sustainable consumption patterns, making more sustainable choices holds great potential to reduce environmental impacts. Yet in the context of interlocking crises, governments face challenges in supporting households with policies that realise this potential.

How Green is Household Behaviour? presents an overview of results from the 2022 OECD Survey on Environmental Policies and Individual Behaviour Change. The survey investigates household attitudes and behaviour with respect to energy, transport, waste and food systems. It was carried out across more than 17 000 households in 9 countries, including Belgium, Canada, Israel, France, the Netherlands, Sweden, Switzerland, the United Kingdom and the United States. The data collected also include information on self-reported motivations and barriers to change, providing a unique source of empirical evidence to inform policy efforts to shift to more sustainable consumption patterns.