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

Please cite this publication as:
OECD (2023), *How Green is Household Behaviour?: Sustainable Choices in a Time of Interlocking Crises*, OECD Studies on Environmental Policy and Household Behaviour, OECD Publishing, Paris, https://doi.org/10.1787/2bbbb663-en.

ISBN 978-92-64-54441-3 (print)
ISBN 978-92-64-17274-6 (pdf)
ISBN 978-92-64-55692-8 (HTML)
ISBN 978-92-64-92294-5 (epub)

OECD Studies on Environmental Policy and Household Behaviour
ISSN 2308-1376 (print)
ISSN 2308-1384 (online)

Photo credits: Cover © Baseline Arts using components from Shutterstock.com

Corrigenda to OECD publications may be found on line at: www.oecd.org/about/publishing/corrigenda.htm.

Table of contents

FIGURES

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

SEX

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

disposable income

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

urban vs rural

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

home ownership

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.

employment status

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 – husbandwife
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]

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%) :

energy costs

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"]

EETs

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]

Financial Support for EETs

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)	○	○	○	○	○	○

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).

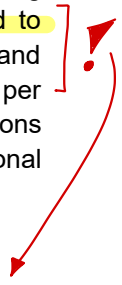

Table A B.2. Targeted sample sizes

	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**

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.

- Sample by target quotas (based on demographics + income)
- to correct imbalances on targets:
  - survey weights at pop-level
  - post stratification weights on country-by-country basis
- Imputation of income

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%