



This project has received funding from the European Union's Horizon 2020-MSCA-IF under grant agreement ID: 101023109

H2020-EU.1.3.2.

Nurturing excellence by means of cross-border and cross-sector mobility



Grant agreement ID: 101023109

Pledge Limits Evaluation for Decarbonization: Goals of the EU27 Strategy

Task 1.3

**Investigation of the EU27 Member State's cultural and social habits
gender-disaggregated and how these may impact national
decarbonising.**

Version 1.0.0

Due date of deliverable: 30/04/2022

Actual submission date: 30/04/2022

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Document info sheet

WP: WP1 State of the art of 'decarbonization policy' for each EU 27 country

Task: **Task 1.3.** Investigation of the EU27 Member State's cultural and social habits gender-disaggregated and how these may impact national decarbonising

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Dissemination level: Public

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List of abbreviations and acronyms

COICOP Classification of Individual Consumption According to Purpose

GDP: Gross Domestic Product

DGs CLIMA and ENER Directorate General CLIMA and ENERGY

Executive summary

Task 1.3 aims to assess the EU27 Member State's cultural and social habits gender-disaggregated where possible, and how these may impact national decarbonizing.

The study is split into two main steps

- Based on Eurostat statistics, evaluation of the energy intensity of the EU 27 household' activities grouped by "Classification of Individual Consumption According to Purpose (COICOP)", to highlight which, among these activities, are more energy consuming (no gender disaggregation possible)
- Investigations on European citizens' habits based on Eurobarometer surveys to explore policy implementation based on citizens' attitudes (gender-disaggregated).

INTRODUCTION

European Union energy intensity based on household expenditure

In recent decades, it has been recognized that to fully understand a household's energy consumption, it is important to study both direct and indirect energy use. Private household consumption is a major driver of total pressure on natural systems¹. Families can be viewed as the smallest social units consuming a complex and changing range of goods and services. The integral model of natural resources entering and leaving households is called household metabolism ². Research into household metabolism requires knowledge of the dynamics of lifestyles: Lifestyles differ in structure and function and therefore have different effects. In addition, diverse lifestyles and their dynamic characteristics have a direct and indirect effect on the range of energy flows and material cycles within the economy. If we use the household metabolism metaphor, we get an image that connects the use of natural resources with the very basis of economic activity: family consumption. Measuring household consumption patterns (expressed in terms of energy values) to understand how to align them with environmentally sustainable goals requires knowledge of the mechanisms of household metabolism. The demand for natural resources is not only determined by the number of households and family consumption but is also a function of biophysical, technical, economic, spatial, and behavioral aspects.

¹ Wencke Gwozdz, Lucia A. Reisch, and John Thøgersen, 'Behaviour Change for Sustainable Consumption', *Journal of Consumer Policy*, 43.2 (2020), 249–53 <<https://doi.org/10.1007/s10603-020-09455-z>>.

² Klaas Jan Noorman, Wouter Biesiot, and Ton Schoot Uiterkamp, 'Household Metabolism in the Context of Sustainability and Environmental Quality', *Green Households? Domestic Consumers, Environment, and Sustainability*, 1998, 7–34.

METHODOLOGY

Resources

Statistical data, academic literature and European Commission documents are the main sources for this research. In particular:

- The expenditure data necessary for the calculation of energy use are from Eurostat
- Energy intensity of GDP for each Member State is from Eurostat
- Question module QA "Attitudes of European citizens towards the Environment" is partly based on questions asked in the context of Eurobarometer 88.1 (ZA6925) and 87.1 (ZA6861).

Methods

Household Energy consumption Energy intensity and household expenditure are put in a relationship by multiplying the household expenditure data³ (Current prices, million euro) by data about energy intensities⁴ of GDP (MJ/Euro) for different products and services according to COICOP classification.

European citizens gender disaggregated data on Mobility, Food and Housing: Gender dimensions have been investigated with data provided by the following Special Eurobarometer:

Special Eurobarometer 505: Making our food fit for the future – Citizens' expectations The "Farm to Fork Strategy" is a fundamental part of the Green Deal that aims to develop a fair, healthy and environmentally-friendly food system in the EU. To gauge public knowledge of the current system and citizens' appetite for change, this Special Eurobarometer aims to uncover their food buying and eating habits, find out what they believe constitutes 'sustainability', assess their willingness to switch to a healthier, more sustainable diet and find out who should be responsible for the change. This survey was carried out in the 27 Member States of the European Union between 3 August and 15 September 2020 among 27,237 European citizens. WEB: https://data.europa.eu/data/datasets/s2241_505_eng?locale=en

Special Eurobarometer 495: Mobility and transport⁵: The Directorate-General for Mobility and Transport conducted a survey in the European Union Member States between 11 and 29 September 2019 to explore a range of factors relating to mobility, including daily and longer-distance travel amongst Europeans. WEB: https://data.europa.eu/data/datasets/s2226_92_1_495_eng?locale=en

Special Eurobarometer 490: Climate change⁶: DGs CLIMA and ENER have published new Eurobarometer surveys showing strong public support for EU climate and energy policies. The surveys asked citizens from all EU Member States various questions about current climate and energy policies and their wishes for future European action. Results were extremely

³ Eurostat, 'Final Consumption Expenditure of Households by Consumption Purpose', 2022 <https://ec.europa.eu/eurostat/databrowser/view/NAMA_10_CO3_P3_custom_2475995/default/table>.

⁴ Eurostat, 'Energy Intensity of GDP in Chain Linked Volumes (2010)', 2022 <https://ec.europa.eu/eurostat/databrowser/view/NRG_IND_EI_custom_2478967/default/table>.

⁵ Directorate-General for Communication, 'Special Eurobarometer 495: Mobility and Transport', *Data.Aeuropa.Eu*, 2019 <https://data.europa.eu/data/datasets/s2226_92_1_495_eng?locale=en>.

⁶ Directorate-General for Communication, 'Special Eurobarometer 490: Climate Change', 2019 <http://data.europa.eu/88u/dataset/S2212_91_3_490_ENG> [accessed 11 May 2022].

encouraging with positive trends for citizens' awareness of climate change, their desire for the EU and Member States to act, and willingness to take personal action to fight climate change. They also support prioritising an EU energy sector which is cleaner, more secure, and more affordable. These surveys will be invaluable in shaping our climate and energy policies over the next five years. The survey results on EU climate policies are available in the reports on the Special Eurobarometer webpage ([WEB: https://data.europa.eu/data/datasets/s2212_91_3_490_eng?locale=en](https://data.europa.eu/data/datasets/s2212_91_3_490_eng?locale=en))

*Special Eurobarometer 501: Attitudes of European citizens towards the Environment*⁷ This survey shows that a large majority of EU citizens in all EU Member States regard protecting the environment as important to them personally, while more than half of Europeans think it is very important. Over three-quarters of respondents agree that environmental issues have a direct effect on their daily life and health, and more than eight in ten are worried about the impact of chemicals present in everyday products. Europeans think that the most effective ways of tackling environmental problems are to 'change the way we consume' and to 'change the way we produce and trade' The survey findings indicate that Europeans want more to be done to protect the environment, and that responsibility should be shared by big companies and industry, national governments and the EU, as well as citizens themselves ([WEB: https://data.europa.eu/data/datasets/s2257_92_4_501_eng?locale=en](https://data.europa.eu/data/datasets/s2257_92_4_501_eng?locale=en))

RESULTS

In this section, firstly an assessment of the energy consumed by EU27 households is carried out to recognize which, among COICOP sectors, are the most energy-consuming.

In the second part, thanks to the Eurobarometer surveys, the author explores citizens' habits for the previous highlighted COICOP sectors: housing services (water, heating, cooling, use of gas and electricity), transport and food habits, here investigated by gender dimension.

Energy intensity of households' activities based on their expenditure

Several approaches are possible to study the patterns of total energy consumption in households⁸: frequently differences in total energy consumption among households are explained by differences in disposal income/expenditure, with a strong correlation between energy and income/expenditure^{9,10,11}.

In the present study, the correlation between household activities and the associated energy intensity is performed according to the "Classification of individual consumption by purpose", abbreviated as COICOP. This is a classification developed by the United Nations Statistics Division to classify and analyze individual consumption expenditures incurred

⁷ Directorate-General for Communication, 'Special Eurobarometer 501: Attitudes of European Citizens towards the Environment', 2020 <http://data.europa.eu/88u/dataset/S2257_92_4_501_ENG> [accessed 11 May 2022].

⁸ Noorman, Biesiot, and Schoot Uiterkamp.

⁹ Robert Herendeen and Jerry Tanaka, 'Energy Cost of Living', *Energy*, 1.2 (1976), 165–78.

¹⁰ Shonali Pachauri and Daniel Spreng, 'Direct and Indirect Energy Requirements of Households in India', *Energy Policy*, 30.6 (2002), 511–23.

¹¹ Angelina HME Reinders, K Vringer, and K Blok, 'The Direct and Indirect Energy Requirement of Households in the European Union', *Energy Policy*, 31.2 (2003), 139–53.

by households, non-profit institutions serving households and general government according to their purpose. It includes categories such as clothing and footwear, housing, water, electricity, gas and other fuels.

With data reported in the section methodology, the author calculated the energy distribution of the COICOP activities of the EU households in the year 2020. Data are reported in Table 1

Table 1. 2020 Energy Consumption for EU27 Member States and EU27 as a whole split by the COICOP sector

2020 Energy consumption (MJ)	Food and non-alcoholic	Alcoholic beverages,	clothing and footwear	Housing	furnishing	health	transport	communication	recreation	education	restaurant and hotel	miscellaneous
Belgium	4.61	1.43	1.29	8.15	2.09	2.08	3.28	0.84	2.40	0.12	1.51	4.26
Bulgaria	3.05	0.83	0.47	2.93	0.81	1.06	1.72	0.82	1.10	0.18	0.72	1.00
Czechia	3.61	1.77	0.66	5.99	1.19	0.60	1.87	0.68	1.73	0.11	1.21	1.72
Denmark	1.01	0.30	0.33	2.36	0.49	0.25	0.95	0.16	0.90	0.07	0.40	0.95
Germany	19.7	5.77	6.37	42.14	11.47	8.77	21.55	3.86	15.86	1.54	6.35	21.14
Estonia	6.69	0.25	0.18	0.60	0.16	0.11	0.30	0.08	0.27	0.02	0.18	0.29
Ireland	0.40	0.24	0.17	1.16	0.18	0.20	0.46	0.12	0.23	0.08	0.44	0.37
Greece	2.87	0.75	0.54	3.41	0.44	0.71	1.53	0.72	0.72	0.34	1.52	1.25
Spain	11.0	3.20	2.29	17.80	3.22	3.29	7.21	1.97	4.14	1.23	6.49	7.70
France	19.2	9.03	4.02	36.23	6.22	5.10	14.97	3.24	9.73	0.61	7.08	15.91
Croatia	1.24	0.39	0.23	1.11	0.31	0.30	0.43	0.28	0.49	0.06	0.49	0.46
Italy	15.61	4.34	5.06	23.66	6.06	3.50	10.12	2.18	5.48	0.88	6.57	9.78
Cyprus	0.23	0.09	0.08	0.29	0.09	0.04	0.20	0.05	0.11	0.06	0.21	0.17
Latvia	0.67	0.25	0.16	0.76	0.14	0.18	0.34	0.10	0.25	0.05	0.01	0.23
Lithuania	1.25	0.35	0.29	0.90	0.44	0.30	0.80	0.17	0.43	0.03	0.20	0.60
Luxembourg	0.14	0.12	0.07	0.37	0.11	0.05	0.19	0.02	0.08	0.01	0.09	0.25
Hungary	2.67	1.13	0.45	3.16	0.78	0.60	1.60	0.42	1.03	0.25	0.87	1.23
Malta	0.25	0.07	0.09	0.28	0.09	0.09	0.18	0.06	0.12	0.03	0.17	0.22
Netherlands	5.11	1.40	1.92	10.46	2.59	1.30	4.39	1.03	3.48	0.28	2.43	5.36
Austria	2.18	0.70	0.93	4.86	1.37	0.79	2.09	0.40	1.68	0.19	2.05	2.00
Poland	11.16	4.11	3.01	13.00	3.58	3.98	7.41	1.46	4.51	0.58	1.91	7.53
Portugal	3.07	0.50	0.84	3.15	0.79	0.82	1.95	0.34	0.88	0.25	2.01	1.66
Romania	6.54	1.49	1.58	4.66	1.78	1.18	2.80	0.86	1.53	0.30	0.87	0.92
Slovenia	0.58	0.18	0.19	0.77	0.21	0.16	0.52	0.12	0.29	0.04	0.21	0.41
Slovakia	2.03	0.56	0.42	3.21	0.64	0.25	0.55	0.32	0.84	0.14	0.57	0.92
Finland	2.36	0.99	0.64	5.76	0.96	0.93	1.96	0.47	1.75	0.07	0.99	1.94
Sweden	2.91	0.80	0.78	5.94	1.43	0.69	2.63	0.66	2.44	0.07	1.16	2.48
EU27	130.16	41.03	33.08	203.11	47.62	37.32	92.01	21.43	62.46	7.60	46.70	90.74

The results are summarized in the following figure 1:, EU 27 Households expenditures accounts for 25% of their total energy consumption in housing, mobility 11%, food 16%, recreation 8%, clothing 4% and health 4% . Together, Food, Transport and housing represent the three main sources of environmental impact for householders' consumption.

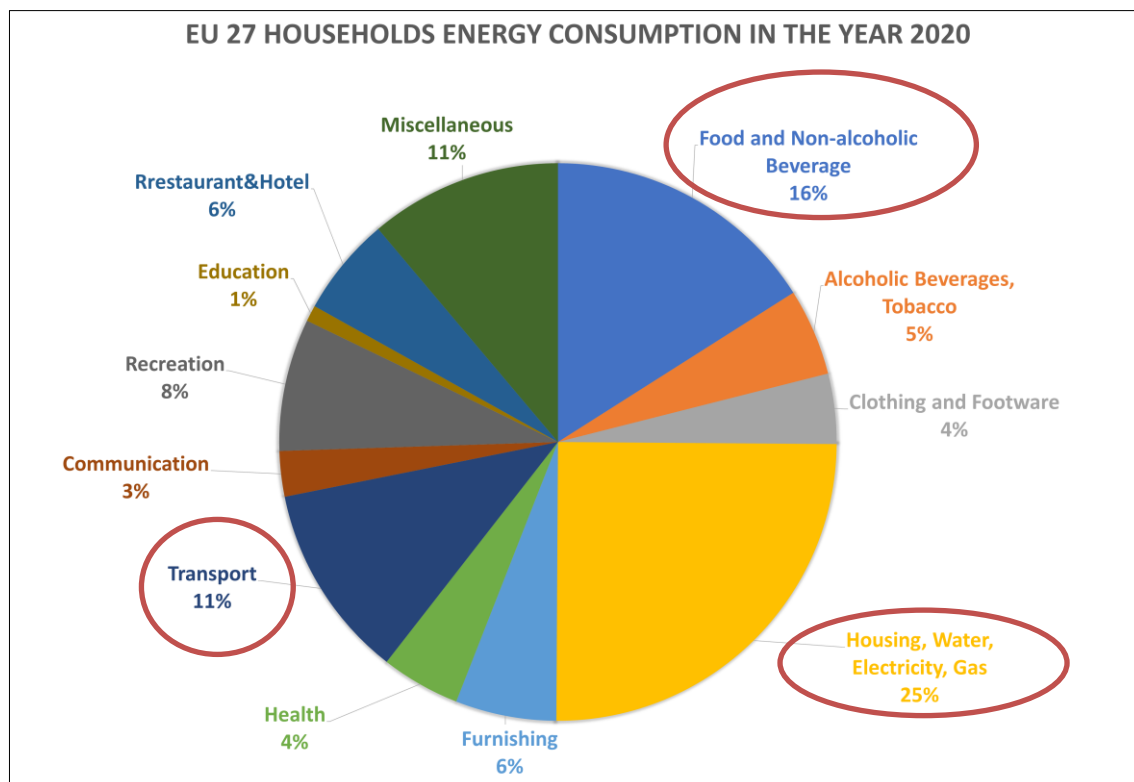


Figure 1 Distribution of energy among households, according to their expenditure split by COICOP sectors, for the year 2020.

To investigate the gender dimension of this aggregate consumption, only Housing, Transport and Food will be considered, with data available from Eurobarometer surveys. Miscellaneous refers to a large range of minor activities that would lose weight if counted singularly.

Investigation of European citizens' habits by gender

All the investigated surveys contain a lot of specific data, reporting also multiple choices responses, and it is also possible to go in-depth into each Member State's preference. But to have a big picture of European citizens' habits, the author presents results of aggregated data for EU27 as a whole, a screen of the "European citizen's" habits.

Food

The following figure 2 reports the EU27 citizens' preferences criteria in buying food. The survey involved over 27000 citizens, and it is also distinguished by gender. The author selected some specific question from the survey, the most representative bound to sustainability and decarbonization objectives.

First selected question: *When you buy food, which of the following are the most important to you? Firstly?*

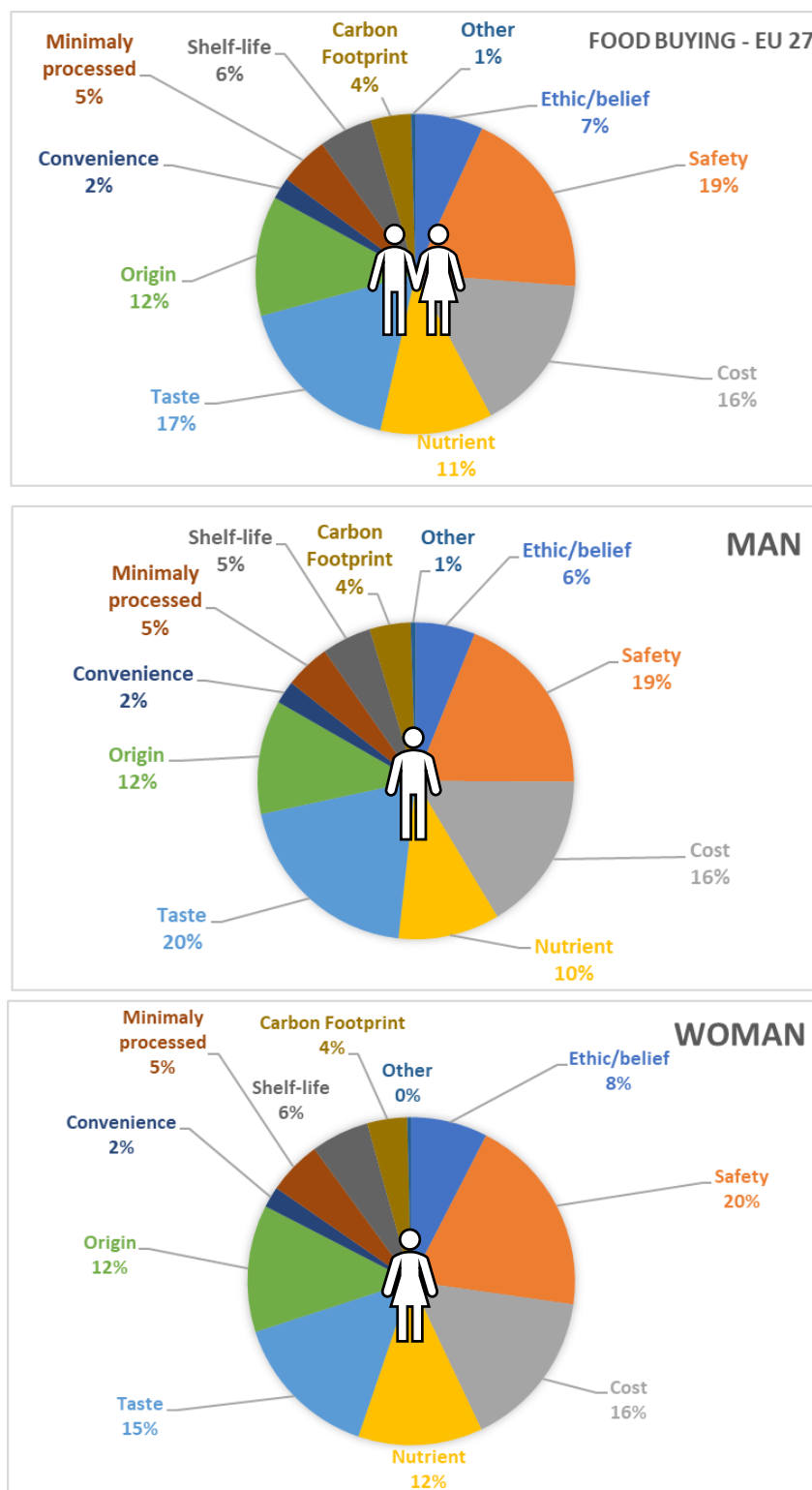


Figure 2 Results from the Eurobarometer 505: Making our food fit for the future – Citizens' expectations for EU27 Member States. Answering what's most important when buying food.

There are no great differences between men and women in the attitude toward buying food according to the criteria proposed by the Survey. However, there are detectable differences for instance in *Taste*, which is the main driver for Men (20%) vs Women (15%); Women redistribute their preference in other criteria as *nutrients* (12% women and 10% men) and *Ethic/belief* (8% women and 6% men), while the other conditions are almost equivalent across the genders.



The second selected question was about how people consider a sustainable characteristic of food: *Which of the following do you consider to be the most important characteristic of "sustainable" food?*

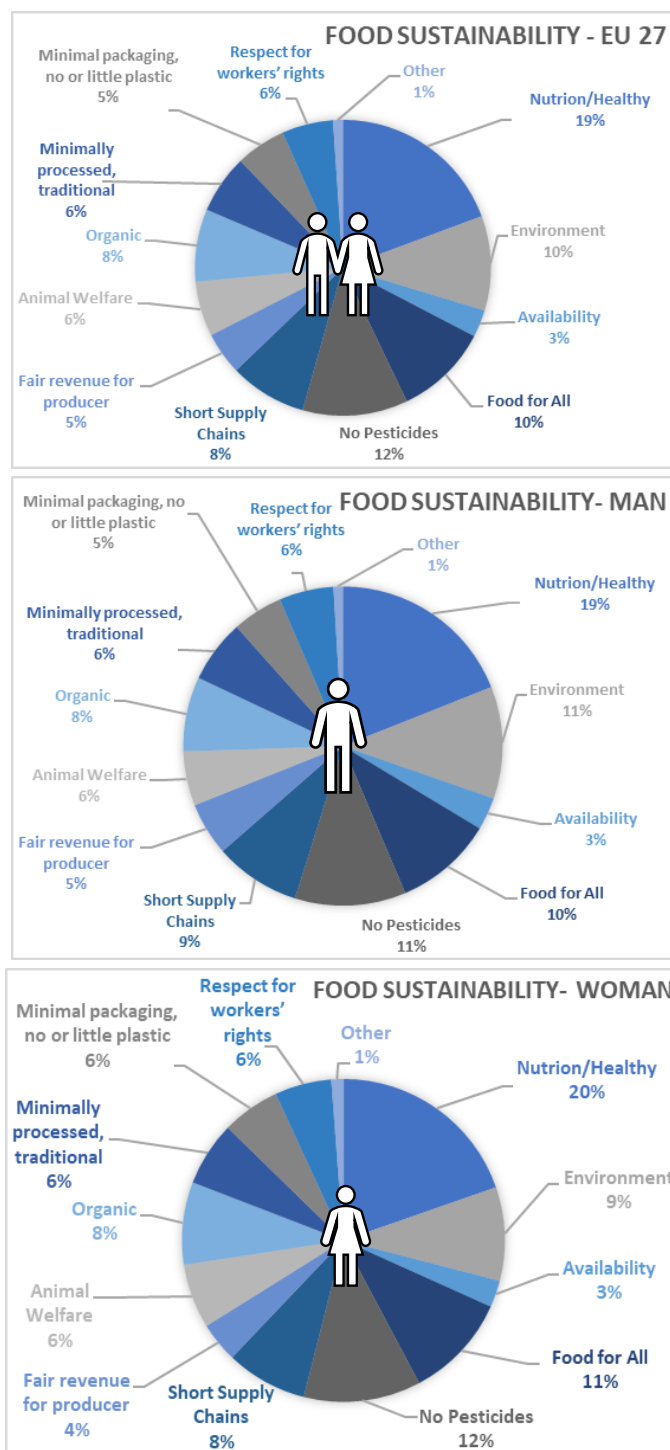


Figure 3. Results from the Eurobarometer 505: Making our food fit for the future – Citizens' expectations for EU27 Member States. Answering about the characteristic of sustainable food.

There are few differences between genders: women seem to show more attention to *pesticides* and *nutrition*, and men show more attention to the *environment* and *supply chain*.

The third selected question was about how people consider their diet: *What aspects of a sustainable diet are important to you?*

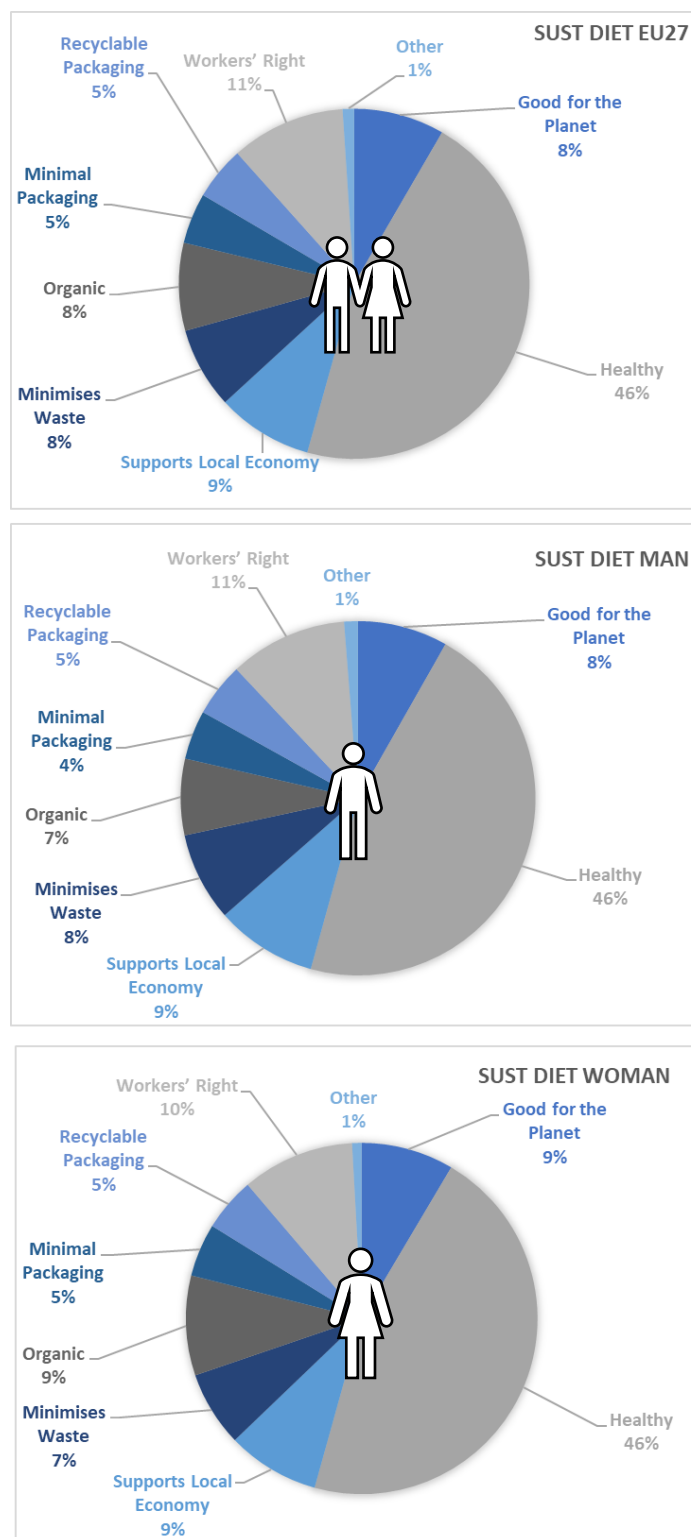


Figure 4 . Results from the Eurobarometer 505: Making our food fit for the future – Citizens' expectations for EU27 Member States. Answering sustainable diet characteristics.

For both the genders, Healthy is felt like a strong connection with sustainability, which is the first requirement citizens connect to a sustainable food; women slightly prefer an organic and good for planet food; men pay slightly more attention to minimizing waste and to the right of workers as preferred characteristic to define a sustainable diet.



The fourth selected question was about the consciousness of eating sustainably: *Would you say that personally, you eat a healthy and sustainable diet*

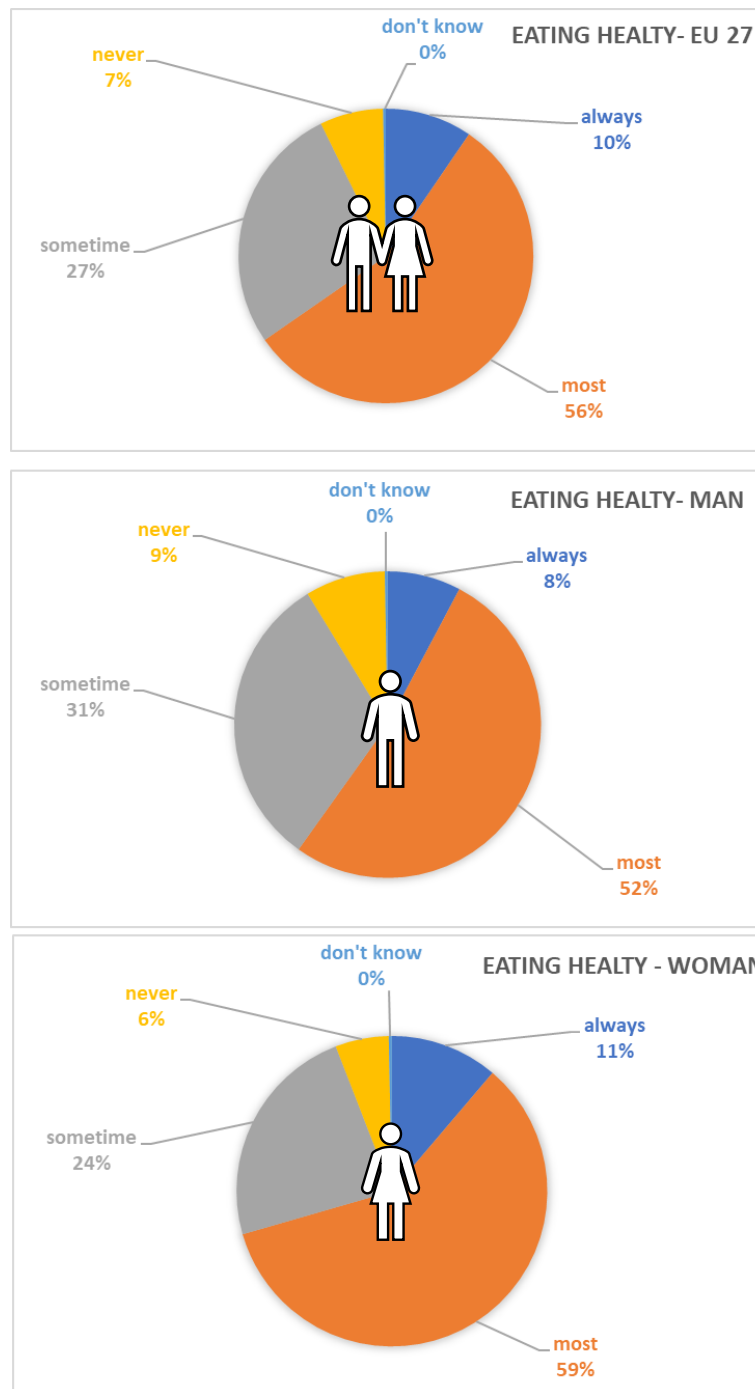


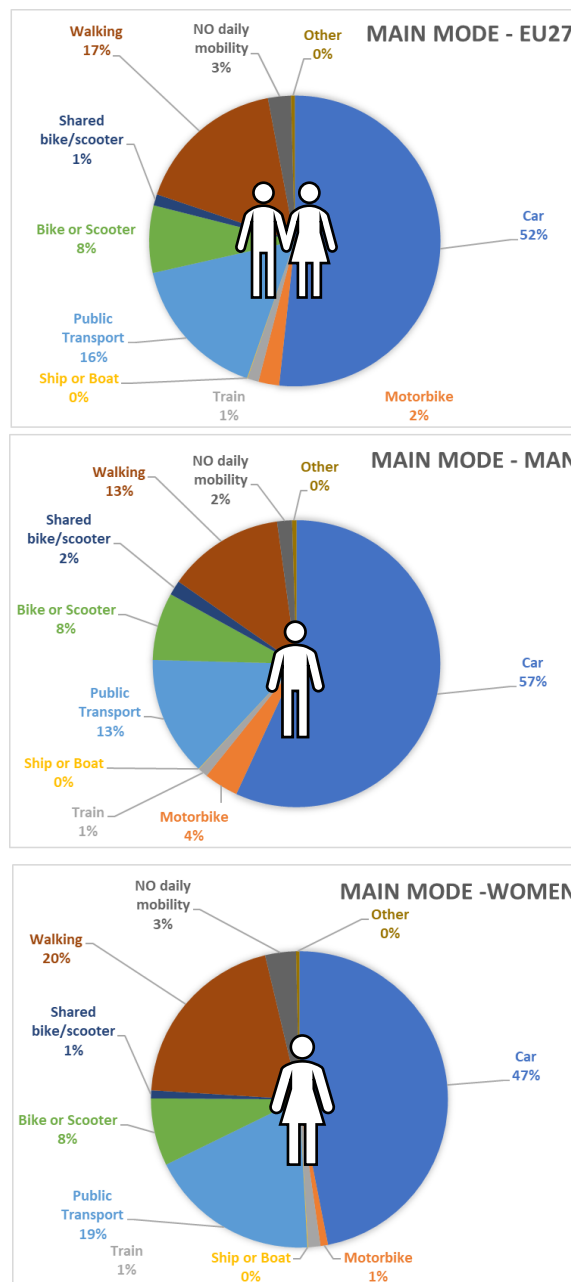
Figure 5 Results from the Eurobarometer 505: Making our food fit for the future – Citizens' expectations for EU27 Member States. Answering their consciousness of eating healthy.

More women than men pay attention to their healthy diets. This is the larger difference between the two genders in the examined set of data. Women declare a desire to eat healthy more frequently than men.

Mobility

In the following figure, the author reports the EU27 citizen's habits/needs on the “Main Mode” mobility. The survey involved over 27000 citizens, and it is also distinguished by gender. The data are from the Special Eurobarometer 495: Mobility and transport¹². As for the survey on food, the author selected most representative questions about the relationship between mobility and sustainability.

First selected question from the survey was related to: “On a typical day, what is your main mode of transport? By main mode, we mean the one that takes the longest time”.



¹² Directorate-General for Communication, ‘Special Eurobarometer 495: Mobility and Transport’.

Figure 6 Results from the Special Eurobarometer 495: Mobility and transport. EU citizens answered, “On a typical day, what is your main mode of transport? By the main mode, we mean the one that takes the longest time”.

Tangible differences are highlighted in *the use of car*: 57% of men use it as a main mode, for women it is 47%, women are used to Public transport and walking more than men. This finding will be further investigate in future, looking at the differences in working demographic across the Member States

The second selected question was about *What are the reasons for using this main mode of transport*

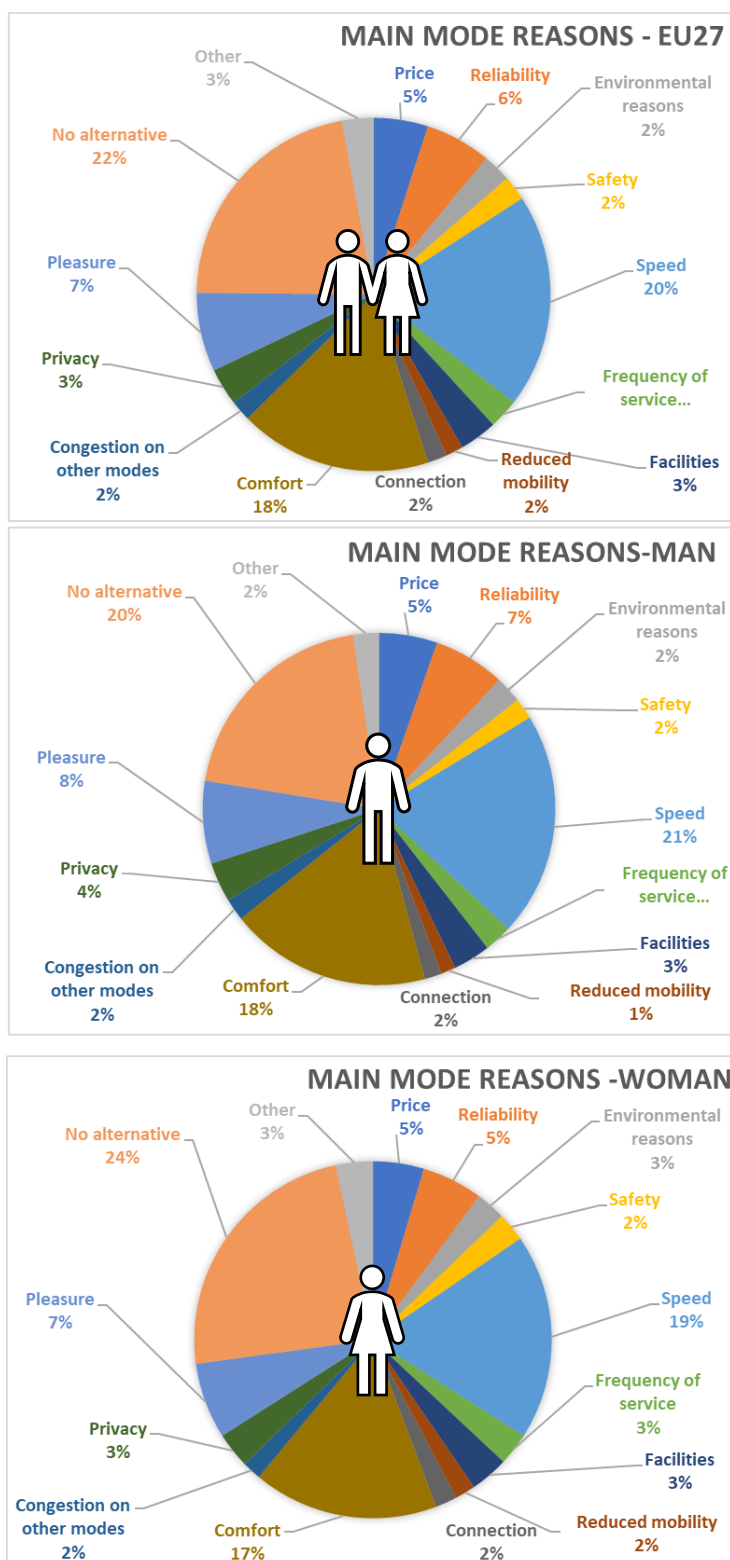




Figure 7 Results from the Special Eurobarometer 495: Mobility and transport. Eu citizens answered What are the reasons for using this main mode of transport?

Assessed that main mode for Men and women, even with differences, is car, it is also both genders indicate that **there are no alternatives** that are, as a second result, speed as cars are and, as a third result, as comfortable as cars are.

The third selected question was about capacity for mitigation: *how citizens will pay more to turn the mobility more sustainable?*

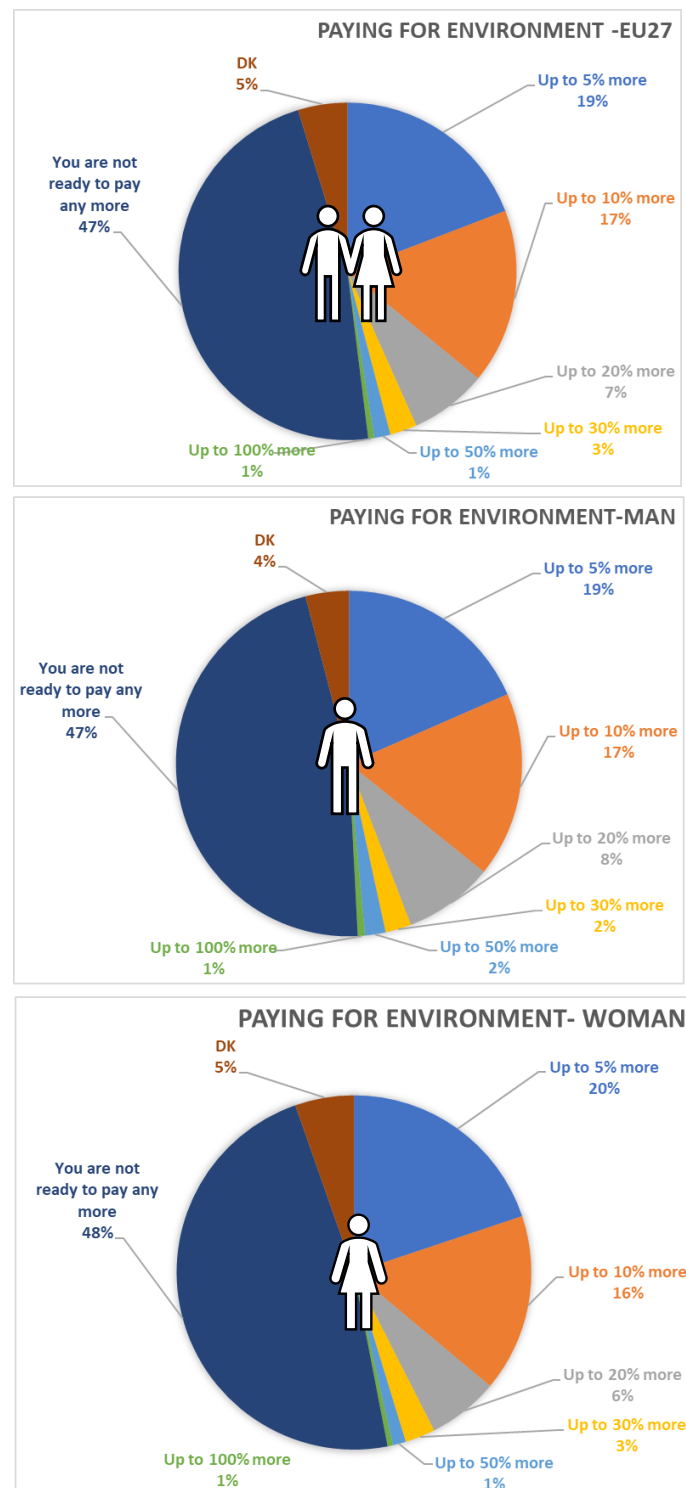


Figure 8 Results from the Special Eurobarometer 495: Mobility and transport. Eu citizens answered “How much more would you be willing to pay for your daily personal transport cost, if this was significantly better for the environment?”

As general result, many of the interviewed citizens are still not ready to pay more for mitigation, or at least no more than 5-10% max, on average. Major differences between men and women are: men would pay up to 20% more, while women's preferences do not exceed 5%.

The fourth selected question, was about longer trips, typical for vacation and work, often implying the use of air transport: *How many domestic or international journeys of 300 km or more have you made in the last 12 months?*

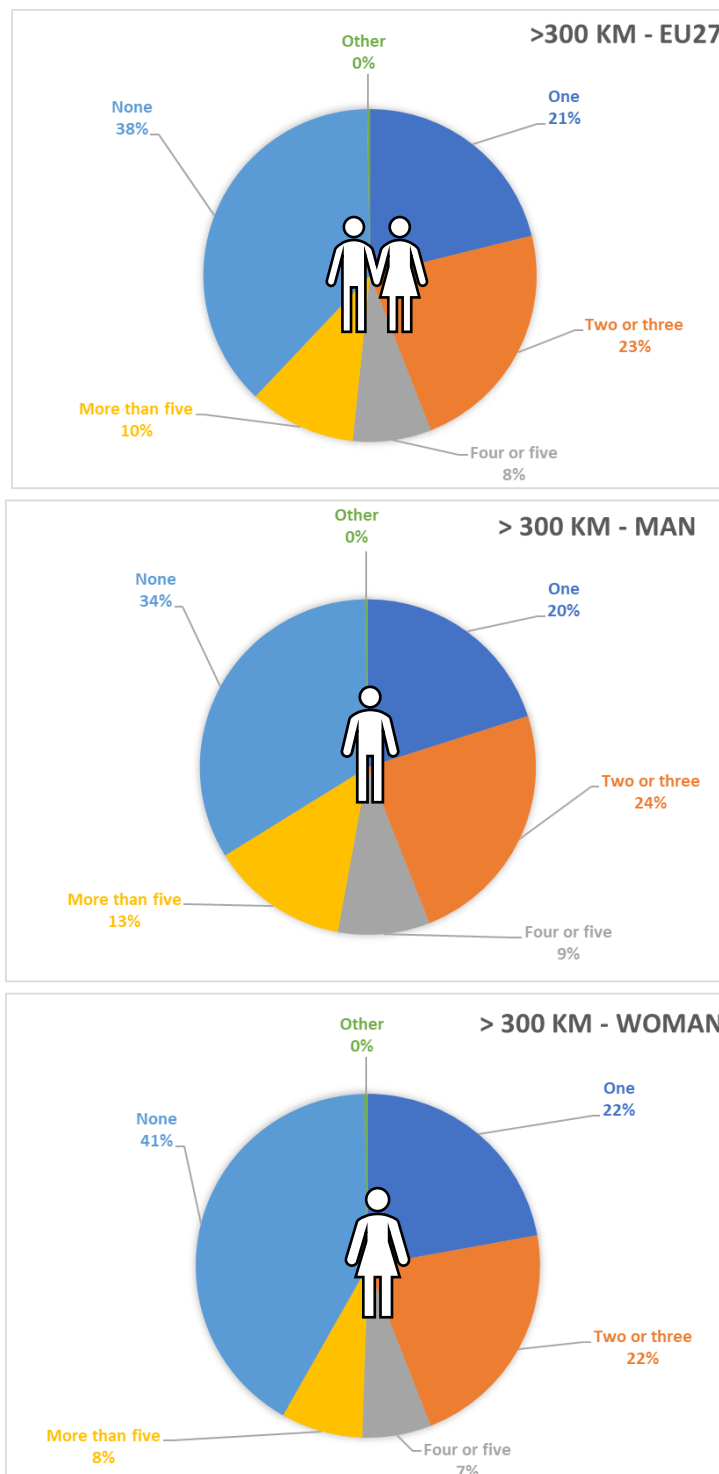


Figure 9 Results from the Special Eurobarometer 495: Mobility and transport. EU citizens answered How many domestic or international journeys of 300 km or more have you made in the last 12 months?

As a general result, men travel longer trips more than women, which, on average travel no more than 1 long trip a year. Men seem to travel longer distance more frequent, typically due to the work duties.

Energy priorities

While data on food habits and mobility is explicit, it is difficult to measure the use of energy resources involved in the citizens' habits. For this reason, in this section, the author reports data about the citizens' opinions on why energy production, consumption and efficiency should be addressed by the EU or the local government in the view to achieving the energy transition. In particular, the questions were:

*How important do you think it is that the (NATIONALITY) government sets targets to increase the amount of **renewable energy** used, such as wind or solar power, by 2030”?*

*How important do you think it is that the (NATIONALITY) government provides support for improving **energy efficiency** (for example, by encouraging people to insulate their home or purchase low energy light bulbs)*

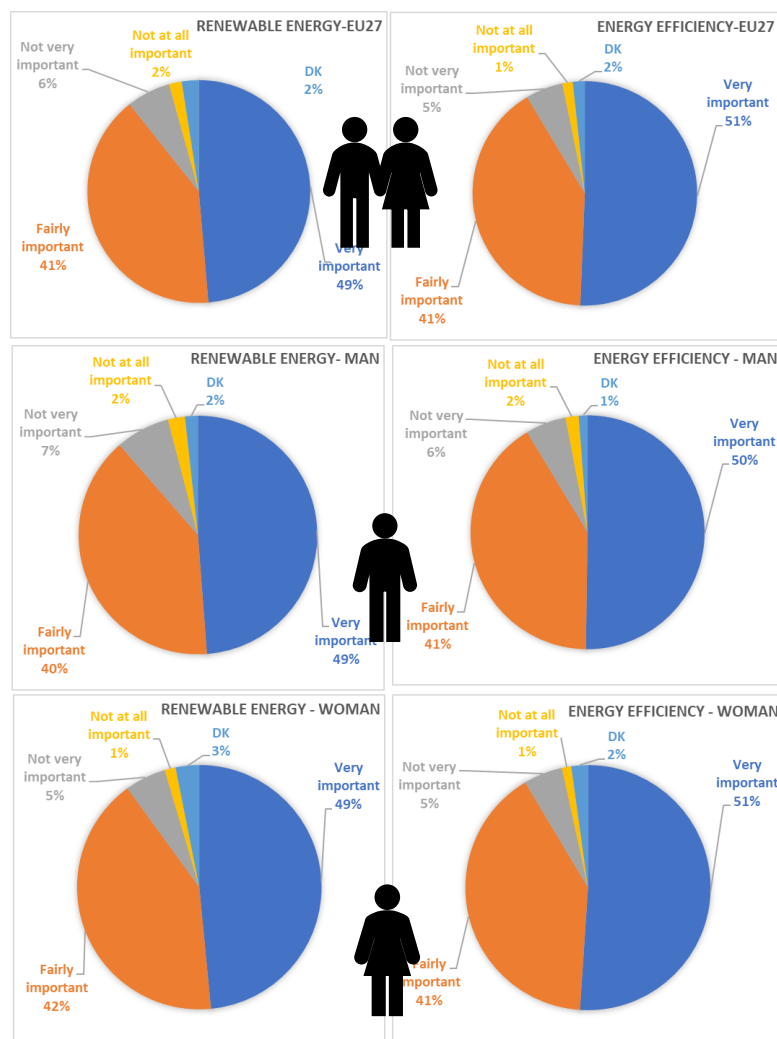


Figure 10 Results from the Special Eurobarometer 490: Climate change: EU citizens answered on level of importance in implementing renewable energy and energy efficiency.

No significant differences are detected between men and women. Energy efficiency and renewables are felt as the most important objectives to be pursued for achieving a more sustainable society.

Environment

This study is based on of the *Special Eurobarometer 501: Attitudes of European citizens towards the Environment*. The survey was carried out between 6 and 19 December 2019 in the then 28 EU Member States. The survey data are indicated as “Eurobarometer 92.4” (EB 94.2). 27,498 respondents from different social and demographic groups were interviewed face-to-face at home in their mother tongue. This Special Eurobarometer survey is the follow-up of a “*Special Eurobarometer 468*” survey conducted in October 2017 (Survey data “Eurobarometer 88.1”, EB 88.1) on the same topic. Many of the questions have been repeated in the Special Eurobarometer 501, some are new. Both surveys include the United Kingdom, not yet out of the European Union in 2019 due to Brexit.

The survey covers the following issues: general attitudes towards the environment and sources of information; impact of environmental issues, and the impact of plastic products and chemicals; ways of taking action to tackle environmental issues; role of the EU in environmental protection; awareness of and attitudes towards ecolabels; perceptions of air quality and ways of tackling air pollution.

In the following figure 11, citizens respond to the question: *How important is protecting the environment?* 4 degrees of importance were assigned on a base of a semantic scale. The result of 88.1 is compared with the most recent 94.2 data. The survey also contains results by gender dimension.

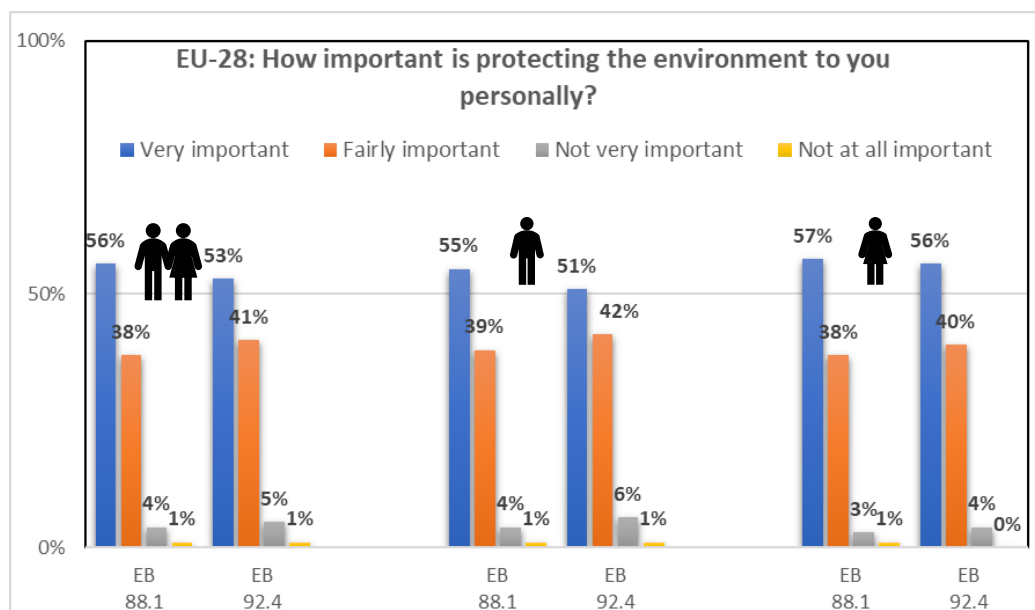


Figure 11 Results of the survey *Special Eurobarometer 501: Attitudes of European citizens towards the Environment* EU citizens answered how important is to protect the environment.

This survey shows that a large majority of EU citizens in all EU Member States regard protecting the environment as important to them personally, while more than half of Europeans think it is very important. Recently a higher number of male citizens chose “fairly important” and a slight decrease in the “very important” one, while women have not changed significantly. However, in comparison to the past survey 486, a higher percentage of people have expressed a “not very important” preference.

In the following figure 12, another question has been explored in detail. *Have you done any of the following in the past six months?* Answered are split into 6 categories by the author: Mobility, Products, Saving, Recycling, Food and Speaking. Some categories were present in the 2017 surveys other are new and only presented in the 2019 survey.

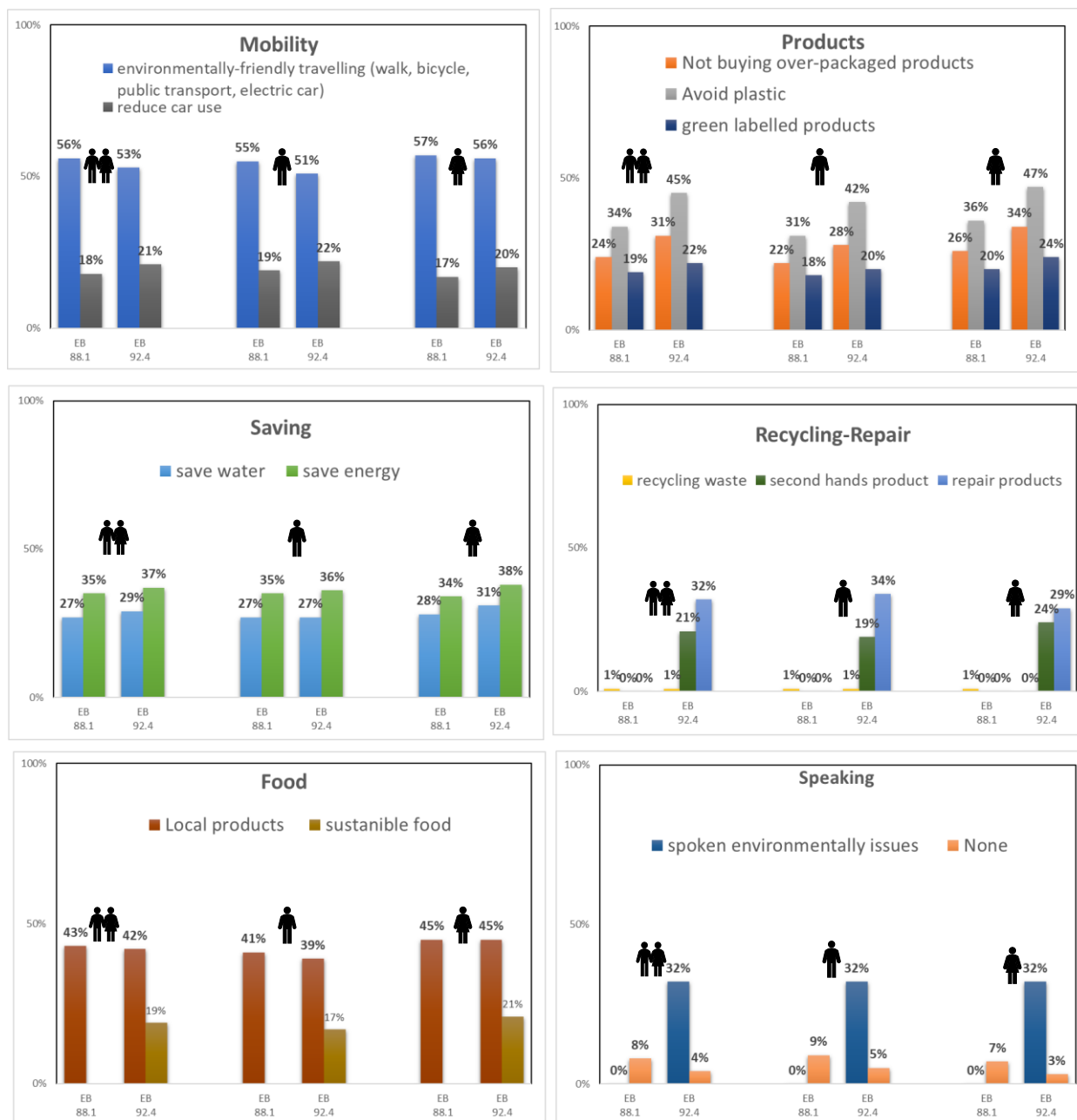


Figure 12. *Eu Citizens answered: Have you done any of the following in the past six months? Responses are split in 6 categories by the author: Mobility, Products, Saving, Recycling, Food and Speaking*

Mobility habits have not changed between 2017 and 2019, even though citizens declared a desire to reduce the use of the car. More detectable changes are seen in using products: all categories (citizens, men and women) have improved their effort in reducing the use of plastics, packaging and paying attention to the green labelling. Energy and water-saving were also improved 2017-2019 by all dimensions. Significant is the introduction in 2019 of activities such as recycling and repairs, and how people started to consider these opportunities of a “second life” for products. Moreover, sustainable Food have been also bound to environmental exploitation and several citizens prefer to buy local food.

Moreover, the “Speaking” section also shows how awareness about environmental issues is rising crossing genders and ages.

CONCLUSION

This task aimed to investigate the possible contributions of European Union citizens in decarbonizing society by utilizing their ongoing habits. The study aims to highlight possible barriers and opportunities in framing policies for food production, mobility and energy use based on the consciousness and habits of European citizens.

Main findings:

1. Most Energy-intensive activities of EU citizens are related to food, transport, and housing
2. Food: For both genders, Healthy food is felt strongly connected with sustainability in food production and consumption.
3. Food: More women than men pay attention to the health of their diets. This is the larger difference between the two genders in the examined set of data. Women declare a desire to eat healthy more frequently than men
4. Mobility: Assessed that main mode for men and women, even with some minor differences, is the car, it is also evident that both genders indicate that there are no alternatives that are, as a second result, as quick as cars are and as a third result, as comfortable as cars are
5. Mobility: As a general result, *many of the interviewed citizens are not still ready to pay more for mitigation*, or at least no more than 5-10% max, on average. Major differences between men and women are more men would pay 20% more, while more women's preferences do not exceed 5%.
6. Environment: citizens recognize the importance of the implementation of renewable energy and energy efficiency in the society
7. Environment: citizens' attitudes slightly changed between 2017-2019, most important changes are about “give a second life to product” and the attention to “green labelled” choices in selecting products, habits could importantly contribute in boosting a circular economy.

As a general remark, habits related to Environment and food are at moment the most suitable to create a further policy to reduce carbon emissions, while on the front of the mobility, cars are still the main but also the preferred mean of transportation. In this regard, the implementation of electric mobility needs to be boosted with a top-down approach, with ad hoc regulations.

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