New Clean Energy Communities in a Changing European Energy System (NEWCOMERS)

Deliverable 6.3

Report on cross-country citizen survey

Version: 2.0

WP6: Current and potential benefits for energy community members and society

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Summary of NEWCOMERS

In its most recent Energy Union package, the European Union puts citizens at the core of the clean energy transitions. Beyond policy, disruptive innovations in energy sectors are challenging the traditional business model of large energy utilities. One such disruptive, social innovation is the emergence of new clean energy communities ("NEWCOMERS").

The possible benefits of these "NEWCOMERS" for their members and for society at large are still emerging and their potential to support the goals of the Energy Union is unclear. Using a highly innovative holistic approach – drawing on cutting edge theories and methods from a broad range of social sciences coupled with strong technical knowledge and industry insight – the NEWCOMERS consortium will analyse European energy communities from various angles. By taking an interdisciplinary approach and through employing co-creation strategies, in which research participants are actively involved in the design and implementation of the research, the NEWCOMERS project will deliver practical recommendations about how the European Union as well as national and local governments can support new clean energy communities to help them flourish and unfold their potential benefits for citizens and the Energy Union.

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Summary of NEWCOMERS's Objectives

As subsidiary objectives, the NEWCOMERS project aims to

- provide **a novel theoretical framework based on polycentric governance theory**, combined with elements from social practice theory, innovation theory and value theory, in which the emergence and diffusion of new clean energy communities can be analysed and opportunities for learning in different national and local polycentric settings can be explored;

- develop a **typology of new clean energy community business models** which allows to assess the different types of value creation of "newcomers" as well as their economic viability and potential to be scaled up under various conditions;

- identify the **types of clean energy communities that perform best along a variety of dimensions**, such as citizen engagement, value creation, and learning, and their potential to address energy poverty, while being based on sustainable business models;

- investigate the **regulatory, institutional, and social conditions**, at the national and local level which are favourable for the emergence, operation and further diffusion of new clean energy communities and enable them to unfold their benefits in the best possible way;

- explore **how new clean energy communities are co-designed with their members' (i.e., citizens' and consumers') needs**, in particular whether new clean energy communities have the potential to increase the affordability of energy, their members' energy literacy and efficiency in the use of energy, as well as their members' and society's participation in clean energy transition in Europe;

- deliver **practical recommendations based on stakeholder dialogue** how the EU as well as national and local governments can support new clean energy communities to make them flourish and unfold their benefits in the best possible way;

- offer citizens and members of new clean energy communities a **new online platform 'Our-energy.eu'** on which new clean energy communities can connect and share best practices and interested citizens can learn about the concept of energy communities and find opportunities to join an energy community in their vicinity.

Find out more about NEWCOMERS at: https://www.newcomersh2020.eu/.

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NEWCOMERS Consortium Partners

Logo	Organization	Type	Country
	Institute for Environmental Studies (IVM), Vrije Universiteit Amsterdam (VUA)	University	The Netherlands
	International Institute for Industrial Environmental Economics (IIIEE) at Lund University (LU)	University	Sweden
	Environmental Change Institute (ECI), University of Oxford (UOXF)	University	United Kingdom
	Institute of Social Sciences, University of Ljubljana (UL)	University	Slovenia
	Institute for Advanced Energy Technologies "Nicola Giordano" (ITAE), National Research Council (CNR)	Research organization	Italy
	RWI – Leibniz Institute for Economic Research (RWI)	Research organization	Germany
	Consensus Communications (CONS)	Private for Profit (SME)	Slovenia
	GEN-I	Private for Profit (Large company)	Slovenia

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KEY ABBREVIATIONS

DE	Germany
ES	Spain
FR	France
IQR	Interquartile range
ISCED	International Standard Classification of Education
IT	Italy
NL	Netherlands
PL	Poland
SE	Sweden
SI	Slovenia
Std. dev.	Standard deviation
UK	United Kingdom
WP	Working Package

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1 EXECUTIVE SUMMARY

This Deliverable, D6.3, focuses on the results of the Citizen Survey on Energy Communities conducted as part of the NEWCOMERS project. The survey addresses preferences, attitudes, and perceptions of European citizens with respect to a renewable energy transition, new forms of energy communities, and how they are to be designed in order to be beneficial. Further, it aims at providing additional insights into the drivers and barriers for their diffusion across Europe and discusses the citizens' willingness to accept or decline demand response mechanisms, such as dynamic pricing.

The survey was conducted in nine European countries (Germany, Spain, France, Italy, the Netherlands, Poland, Sweden, Slovenia, and the United Kingdom) and complements other subprojects ("working packages") within the NEWCOMERS project by providing quantitative large-scale data on the general populations' views on energy-related issues as well as energy communities. The target sample consists of 13,500 participants, corresponding to 1,500 per country.

One first main finding is that the majority of the participants in all countries take problems of climate change and protecting the environment rather seriously. Consequently, an energy transition, i.e., shifting towards energy production through renewable and sustainable sources, is supported to a large extent. A substantial share (approximately 40%) of the participants who do not have a green electricity tariff could well imagine switching to one. About two thirds of the respondents agree with a phase-out of coal as a source of energy, while less than half of the sample agree with a nuclear phase out and/or refraining from the use of nuclear energy. There is a rather large share of participants who "neither agree nor disagree" with the nuclear phase-out (31%), and 23% actually "disagree" or "strongly disagree" with it. Regarding perceived fairness and cost distribution of such an energy transition, participants show mixed views, thereby labelling this as an aspect that requires additional attention.

It further turns out that there are substantial differences in the use of demand response mechanisms across all nine countries. This applies, for example, where the price for electricity depends on the time of the day and/or the current overall demand. Some countries show sizeable proportions of people who already use such variable tariffs (61% in Slovenia, 48% in France, and 48% in Spain) whereas in other countries this does not seem to be very common at all (6% in Germany, 9% in Sweden, and 14% in the United Kingdom). An experiment on demand response mechanisms was conducted, and it shows that most participants would generally consider switching to a tariff with a variable price for electricity. It is further investigated if these preferences depend on whether the variable tariff is administered through an energy provider or an energy community and how important reducing costs and emissions is to potential users.

Regarding energy communities, a first and important insight is that only 16% of the participants are actually aware of any energy communities. In total, 4% of the entire sample are members of an energy community, which equates to 498 participants. Yet, it can be said that some differences exist across countries regarding the awareness of energy communities and memberships. Awareness is highest in the Netherlands, with 29% of all participants, and lowest in France, with only 9%. In a similar pattern, the highest share of members in energy communities is found in the Netherlands at 9%, and the lowest in France at 0.80%. Among those who already knew about energy communities, it is found that the Internet, social and local media are the most named sources for becoming aware of energy communities. Not being aware of energy communities is mentioned as the main reason for not joining them, followed by a lack of skills and knowledge. Similar barriers exist for not starting an energy community, extended by a perception that this would be more knowledge-intensive, costly, and time-consuming than joining an existing energy community. When asked about what the main motivation is for being part of an energy community, the environmental benefit turns out as the most prominent one, followed by the economic benefits. Energy communities are considered to be important or even very important for the transition towards a sustainable energy system by those participants who are already aware of them. Further important benefits of energy communities are seen by the majority of

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participants in the reduction of fossil fuel consumption and electricity costs, as well as in establishing one's own energy security. Energy communities are also understood as a tool to make the energy transition fairer. Participants find investing and earning money through energy communities important, but not as important as many other aspects. Results also showcase that a substantial share of participants would be generally willing to join or start an energy community, some of which have even considered doing so or made specific arrangements. At the same time, though, about half of the participants also point out that they are not sure whether they correctly understand all benefits that energy communities could provide. These results reveal that there is still untapped potential in the promotion and implementation of energy communities in European countries.

Based on a hypothetical choice experiment, we compare several aspects and characteristics of different potential forms of energy communities. The estimates for the entire sample suggest that the respondents strongly value the financial benefits, i.e., saving money through lower electricity costs, that emerge from joining an energy community. This finding is consistent across all nine countries. Nevertheless, an average of 15% across the whole sample is not willing to join any type of the proposed energy communities. The experiment further reveals that participants seem to dislike anonymous communities with no contact among members. A preference for local energy communities that allow contact in person, in comparison to virtual communities is not observed as long as the virtual community involves personal contact among community members. However, a strong desire to be actively involved in the decision-making process of the energy community can be observed across all countries. Having to make investments into the energy community, on the other hand, or even just having the (voluntary) option of doing so does not seem to be attractive to the participants.

All in all, the key findings of this survey are as follows. The level of knowledge on energy topics varies, and the awareness of the social innovation of energy communities is bounded. Generally, the respondents reveal that they are motivated by environmental and financial benefits arising from such innovations. Moreover, barriers to joining and initializing an energy community exist and therefore should be eliminated. These impediments include, but are not limited to, the lack of qualifications and resources as well as concern about other members' conduct. In consequence, increasing the publicity for energy communities and possibly re-configuring existing ones likely play into the participants' inclination to behave prosocially such that the environmental potential is fully exploited.

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2 INTRODUCTION

This report describes the results of the international citizen survey, which investigates the preferences and attitudes of European citizens towards a renewable energy transition, the beneficial design of energy communities, and demand response mechanisms, inter alia.

2.1 Background

The increasing need for and awareness of a fast, smooth, and viable energy transition do not only manifest themselves in the government designing political concepts which are then translated into practice by large energy providers but also on the common household level. Therefore, the question of integrability arises: how can citizens adapt their everyday lives such that essential climate objectives are met without loss of willingness to participate in the transition? The energy-system transformation has experienced a rather centralized trajectory in a sense that the responsibility for the energy transition is considered to be primarily borne by policymakers and politicians on national and, partly, local level. The European Commission proposes in its European Green Deal a reduction of net greenhouse gas emissions by 55% or more by 2030, compared to 1990 levels. Moreover, as this requires more energy generation by renewable sources and a higher energy efficiency, the European Union targets a share of renewables in its energy mix of 40%. Accordingly, the Commission aims to reduce final and primary energy consumption by 36-39% in order to decrease emissions and energy costs for all market participants. Overall, carbon neutrality shall be reached by 2050 (European Commission, 2021). In 2019, the EU installed the "Clean energy for all Europeans" package (Directorate-General for Energy, 2021) placing EU citizens in the focus of the transition. In accordance with the new policy, the emergence of so-called energy communities is to be endorsed following a polycentric approach. Considering smart technologies, these communities shed light on the interplay between governments, companies, and households in many European countries. A survey conducted by Fischer et al. (2020) in Germany shows that the majority of the respondents are not yet familiar with energy cooperatives at all and only a very small proportion are already members of energy cooperatives. Meanwhile, however, their survey also revealed the participation potential, since around half of the participants who were aware of or familiar with energy cooperatives indicate a high willingness to volunteer or invest into energy cooperatives. The vast majority of them also show positive associations with energy cooperatives. In order to fully exploit the potential of such social innovations, they must be diffused in the broad population of each country. Therefore, the status-quo social acceptability must be identified, contouring possible opportunities and barriers, and eventually improved. This, in turn, requires a thorough understanding of cross-cutting issues related to socioeconomic, gender, sociocultural, and sociopolitical matters. The whole process of obtaining and analysing that information aims to finally derive policy recommendations for all relevant stakeholders.

2.2 Role of this deliverable in the project

For the purpose of achieving named objectives, we conducted an international citizen survey. As part of the working package 6 (WP 6) module, the RWI – Leibniz Institute for Economic Research in Essen, Germany, (RWI) has been tasked with designing and examining this survey (Task 6.3). It was conducted within the scope of the NEWCOMERS project which is funded through the European Union's Horizon 2020 research and innovation programme. In Germany (DE), Spain (ES), France (FR), Italy (IT), the Netherlands (NL), Poland (PL), Sweden (SE), Slovenia (SI), and the United Kingdom (UK) approximately 1,500 participants each were sampled allowing for cross-country comparisons. Aspects that are covered by the survey are, among others, European citizens' level of energy literacy, citizen awareness of new energy community business models as well as perceived benefits of energy communities across countries. The survey also includes three experiments, in which individual preferences for different types and characteristics of energy communities as well as citizens' willingness to accept demand

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response mechanisms will be elicited. The report presented here makes an important contribution to the NEWCOMERS' objectives, as it is dedicated to learning more about the attitudes of the general public, in particular of people who have often not yet made any experiences with energy communities. In this way, the survey functions as a complement to the project's case studies, which are attempting the implementation of such communities in practice. Together, results can inform policymakers, energy operators, and citizens on how to successfully set up and manage energy communities that grow to make an influential contribution towards a renewable, inclusive, and secure energy system. However, this deliverable provides primarily descriptive statistics and does not intend to go into detailed interpretations or policy advice. **Figure 1** presents the role and position of working package 6 within the NEWCOMERS project.

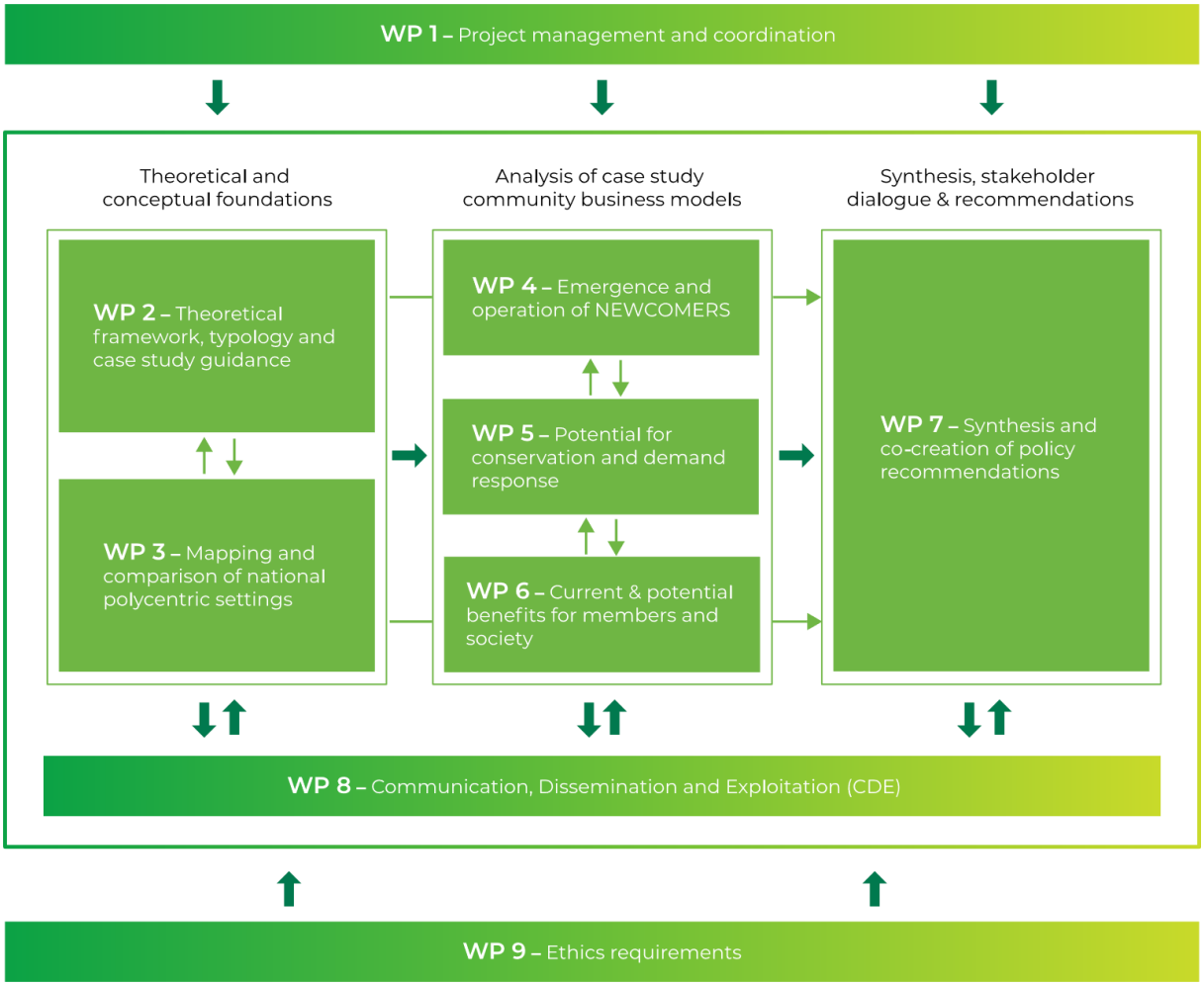

Figure 1: Working Package 6 within the NEWCOMERS project

2.3 Overview of questionnaire

The questionnaire covers a range of energy-related issues, in particular the topic of energy communities. Socioeconomic information is collected in two blocks, one placed at the start and one towards the end. In addition to general personal characteristics – such as age, gender, education, income, household size and number of children – questions relate to participants' housing situation, including their type of electricity tariff and conditions for photovoltaic on their roof.

Following the first block of socioeconomic questions, the survey investigates respondents' attitudes regarding factors related to the energy transition, such as the use of different energy sources, energy

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efficiency, climate change, fairness, and the role of government in shaping energy policies. Then, the participants are asked to self-evaluate their knowledge of energy-related issues, before their energy literacy is assessed via a short quiz consisting of five questions.

Having completed the quiz, the participants are presented with the topic of energy communities. Those respondents who were not yet familiar with the concept receive a brief introduction, while those who were familiar are asked more closely under what circumstances they had already encountered an energy community. The survey continues by asking respondents to declare as how important they perceive the various benefits of energy communities. Next, potential drivers and barriers for the diffusion of energy communities are investigated. To gain an even better impression of people's preferences, the participants are asked to take part in a choice experiment in which they face four scenarios with two hypothetical energy communities each. Participants could either mark one of them as preferrable, thereby indicating a willingness to participate in such an energy community, or declare that they do not favour any of the two.

The next section covers the topic of demand response and examines whether citizens would be willing to adapt to energy tariffs whose prices depend on current supply and demand as well as whether they would be willing to align their energy consumption to the amount produced by an energy community. Furthermore, the survey involves a donation experiment that considers how different variations of information about so-called micro-grids and their benefits for power supply affect people's willingness and motivations to donate.

Towards the end, there are several questions asked regarding the participants' prosocial behaviour in their everyday life. The survey finishes with a psychology-based investigation, asking respondents about their attitudes towards people with varying degrees of closeness, their behaviour in a recent situation of conflict and their stance on concepts such as identity, time preferences and personal values. Note that some of the sections are randomised, which means that each participant does not have to respond to every single question. For example, respondents only get to participate in either the choice experiment on energy communities or the demand response experiment. This is necessary, firstly, to limit the overall length of the survey and, secondly, to avoid any experimental and treatment effects to spill over to other parts of the survey, where they are not desirable.

2.4 Approach and structure of report

The fieldwork took place in nine European countries between 13 October and 14 December 2021. The data collection was conducted online via the platform "mingle" that is administered by respondi AG, a firm specialised in digital market research and data science. Participants can register with mingle for free and are rewarded with "mingle points" for each completed survey. These points can be redeemed for shopping vouchers or cash. All participants saw and answered the survey in the national language of the country in which they conducted it. All responses are treated anonymously.

The survey content and design were developed with the support of all NEWCOMER's consortium members and tested thoroughly via multiple internal reviews. In addition, we conducted in collaboration with respondi a pre-test on mingle with a preliminary sample of 600 respondents from France, Germany, Poland, and the United Kingdom. The responses obtained from the pre-test were not used for the analysis presented here and only served to improve and refine the questions in the final survey.

This report gives a first comprehensive overview over the results from the survey and focusses on the topic of energy communities. It starts with a presentation of characteristics of survey participants, in particular, the four socioeconomic characteristics that were relevant for the creation of a representative sample: age, gender, education, and income. In the next subsection, the distribution of

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these four characteristics is compared against the target distribution, i.e., the real distribution in each respective country. As the sample was filled according to the respective countries' quotas for these four characteristics, no observations could be included in the final data from participants who refused to reveal their age, gender, education, or income.

Next, a description of living conditions of the participants follows, which is particularly relevant for the topic of energy communities as their living conditions do to a large extent determine whether an active involvement in decentral energy production is possible or not, for example through the installation of solar panels on building rooftops.

The main results of the survey are presented in chapter 3, starting with general attitudes towards the energy transition and a short quiz to determine each participant's level of knowledge on energy-related issues. It follows a section that asks about the awareness of energy communities in order to find out if the concept of energy communities is known to participants in the nine European countries. On a descriptive level, we investigate how many people are interested in such concepts, how many people are already (active) members and how many have even started energy communities by themselves. Subsequently, parts of the survey questions are filtered so that different questions or options to answer are shown to participants depending on their previous answers. Over the course of the presentation of results, no inferential analyses, such as tests or estimations will be conducted, but the focus lies on descriptive outputs. These do primarily consist of different types of graphical presentations as well as of summary tables.

As already explained in subsection 2.3, further data has been collected on more specific, additional topics related to psychological and behavioural traits. These are not entirely presented in this report as they are more relevant for inferential analyses, i.e., how they relate, among others, to willingness to participate in energy communities but are of little interest on a merely descriptive level of presentation.

The report delivers the main findings in aggregated form and separated by country if the separation leads to meaningful insights and differences are of importance. A substantial share of more detailed and country-specific tables can be found in the appendix and references are made in the main text to the respective tables as source of information there. However, due to the length of the survey and amount of data it seems neither feasible nor reasonable to draw detailed tables for all subindices and countries, even in the appendix. We therefore regularly complement tables and figures showing aggregate numbers with country-specific information if (and only if) they stand out. This is done in-text and not always documented by corresponding tables. On request, the authors can provide country specific tables for all variables and subindices.

The survey also includes three experiments, which are related to energy topics. It finishes with a conclusion that summarises findings and does, in parts, set out to some first evaluations and interpretations.

2.5 Sample description – socioeconomic variables

To begin with, an overview over the sample from nine selected European countries will be presented.

Subsection 2.5.1 presents the distribution of the four characteristics that were used for creating a representative sample: age, gender, education, and income. It also includes some information on household size and the number of children.

Subsection 2.5.2 then proceeds to check the aforementioned four characteristics against country quotas to determine the level of representativeness of the collected data sample.

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Thirdly, in subsection 2.5.3, some information on living conditions of participants, which are relevant for (decentralized) energy production and, thereby, energy communities, are presented.

2.5.1 General

In total, the survey reaches a sample size of 13,499, with approximately 1,500 participants per country (**Table 1**). As indicated by table 1, one participant is missing in the Dutch sample, which therefore consists of only 1,499 participants. The person failed to indicate their income and can therefore not be accounted towards the quota scheme as discussed in subsection 2.5.2. **Figure 2** shows the age of the participants ranging in six categories from 18 to 69. The mean age of all participants is 44.64. The participants from Sweden are on average the youngest with a mean of 43.34 years, while those from Germany are on average the oldest, with a mean of 45.79 years. The number of participants aged 39 make up the largest share of the total sample with 2.53% (342 participants), whereas the group of 18-year-olds is the smallest with 0.81% (110 participants).

Table 1: Sample size and age (S4)

Country	Sample size	Mean age	Std. dev. age
DE	1,500	45.79	14.00
ES	1,500	44.56	13.38
FR	1,500	44.42	14.38
IT	1,500	45.05	13.71
NL	1,499	45.30	14.54
PL	1,500	43.76	14.32
SE	1,500	43.34	14.42
SI	1,500	44.93	13.80
UK	1,500	44.61	13.80
Total	**13,499**	**44.64**	**14.06**

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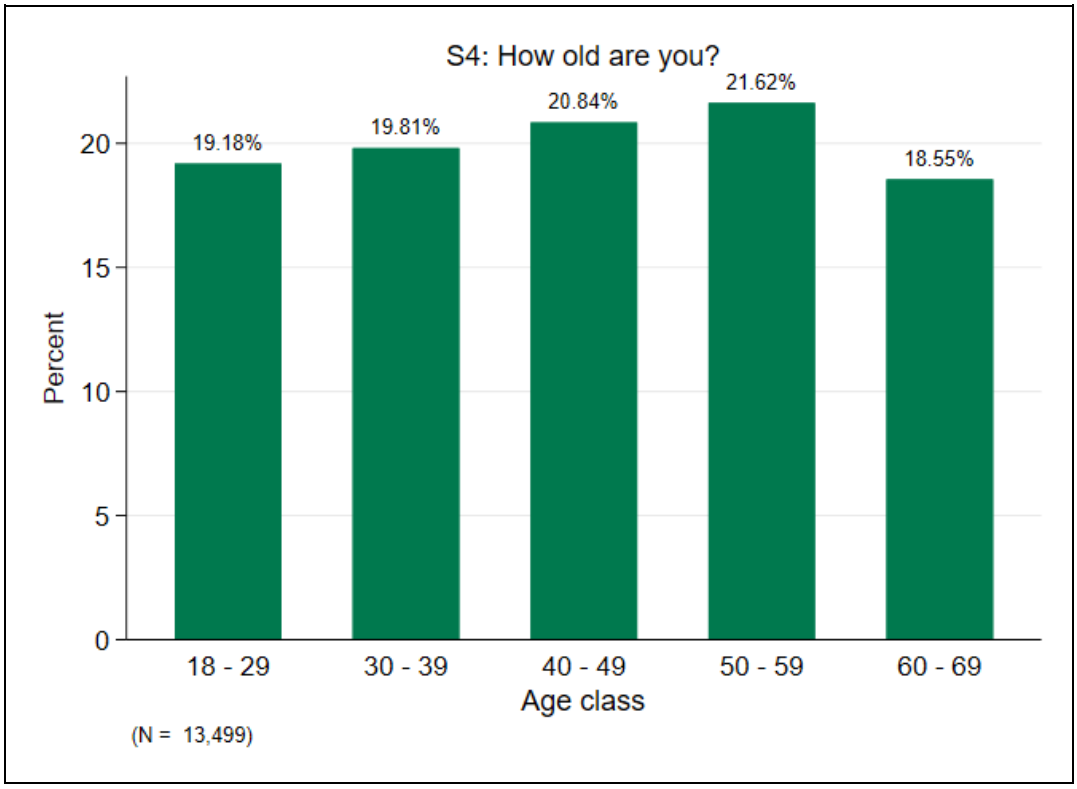

Figure 2: Age distribution (S4)

As illustrated in **Figure 3**, the gender distribution across the participants is nearly even. While the samples from Germany, the Netherlands and Slovenia show a slightly higher proportion of male participants, there are a few more female than male participants in Spain, France, Italy, Poland, Sweden, and the United Kingdom. Sweden has the least even gender distribution with 699 male and 801 female participants. All in all, there are 6,678 (49.47%) male and 6,821 (50.53%) female participants.

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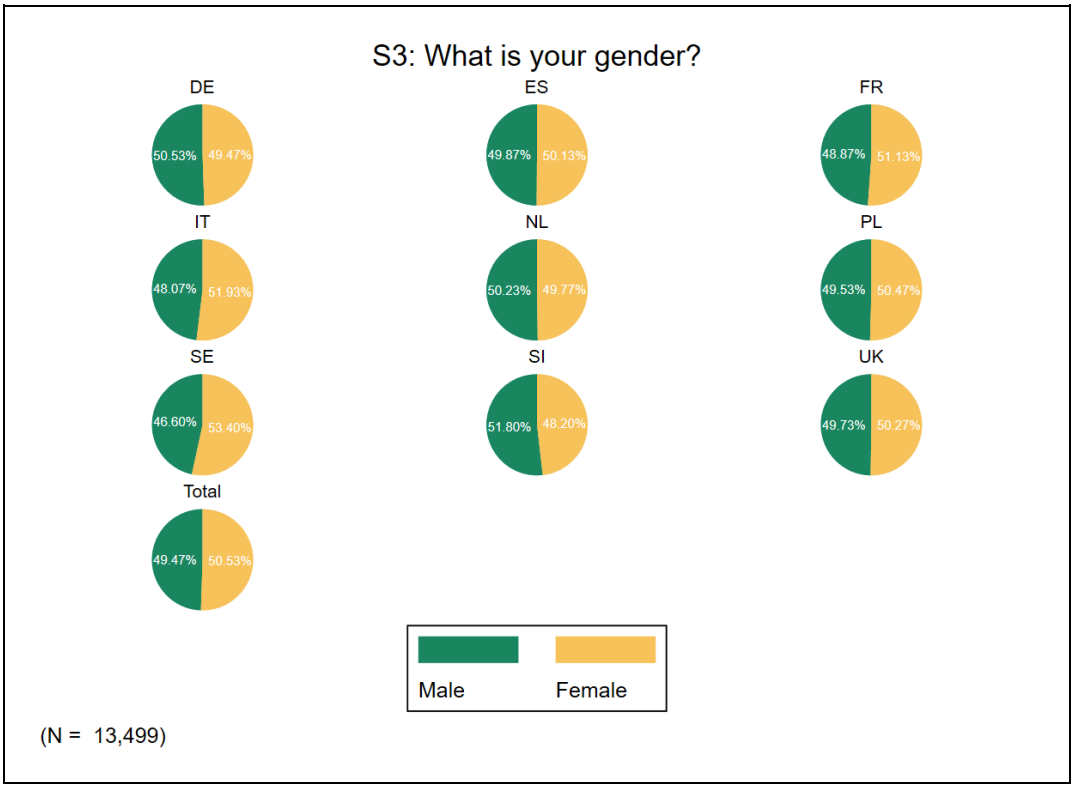

Figure 3: Gender distribution (S3)

Pursuant to Table 2, the classification was translated and adjusted according to each country's particular educational system. Participants could then be categorised into one of three aggregate classes as shown in **Figure 4**. It turns out that, across the entire sample, 16.16% have attained only primary or below upper secondary education, while more than half of the participants (52.20%) have attained upper secondary or post-secondary education (**Table A.1**). About one third (31.65%) of the participants have attained tertiary education.

Spain stands out with a relatively high share (29.33%) of participants who have completed below upper secondary education as their highest level of education (**Table A.1**). However, also in Spain, the share of participants who have attained tertiary education is the third highest with 35.67% following the Netherlands (36.16%) and the United Kingdom, where 41.87% have attained tertiary education. In Slovenia, the proportion of participants with below upper secondary education is the lowest with 3.93%. Simultaneously, Slovenia has the highest share of participants who have attained upper-secondary or post-secondary education with 66.73%. It should be noted that the ISCED-class pattern of educational outcomes does not always exactly match each country's national educational system. There are further variations in duration of educational cycles so that ISCED classes might not always be entirely comparable across countries.

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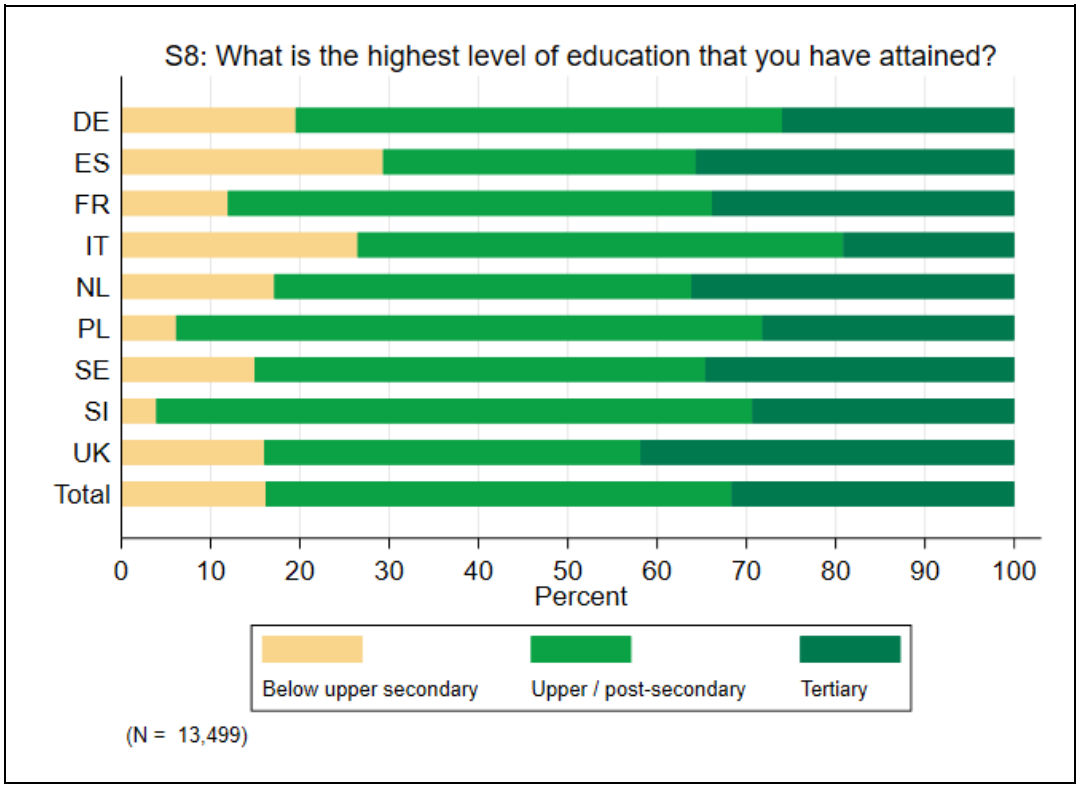

Figure 4: Distribution of education levels (S8)

Table 2: International Standard Classification of Education (ISCED)

ISCED	Classification	Simplified classification
1	Primary education	Level I: "Below upper secondary"
2	Lower secondary education	
3	Upper secondary education	Level II: "Upper/post-secondary"
4	Post-secondary, non-tertiary education	
5	Short-cycle tertiary education	Level III: "Tertiary"
6	Bachelor's degree	
7	Master's degree	
8	Doctorate	

In S9, the participants are asked to indicate what range matches their household's total net monthly income. The income is asked as "unequivalized net household income", which means the net (after taxes) total household income. It is not adjusted to the number of household members but portrays the actual amount of money that the respective household has at hand each month. As it is shown in **Figure 5**, the respondents are shown 22 income ranges starting with "less than 500 euro" and ending with "5,500 euro or more" as the last option. For countries outside the euro area, the respective currencies (i.e., PLN in Poland, SEK in Sweden, and GBP in the United Kingdom) are shown to the respondents according to the exchange rates and later adjusted to euro again in order to be able to compare values across all nine countries.

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The median of the net monthly income across the participants of all countries falls into the category of 2,000-2,249 euro (**Figure 6**)[1]. The number of participants replying with an income range of 1,000-1,249 euro makes up the largest share (mode) of the total sample with 9.35%, very closely followed by the second most frequent income range of 2,000-2,249 euro with 9.16% of the respondents (**Figure 5**). On the other hand, the income range of 5,250-5,499 euro is the least frequent with 0.83% of the participating sample. When comparing the different countries, on average, the participants from Sweden have the highest household's total net monthly income with a median at the 3,000-3,249-euro class, followed by the participants from the United Kingdom with a median at the 2,750-2,999-euro class (**Figure 6**). The participants from Poland have the lowest household's total net monthly income with a median at the 750–999-euro class. In the same way, Poland has the largest share of participants who fall into the first income range, i.e., a household's total net monthly income of less than 500 euro, with 25.00%. Meanwhile, Sweden has the largest share of participants who fall into the last income range, i.e., 5,500 euro or more, with 12.80%.

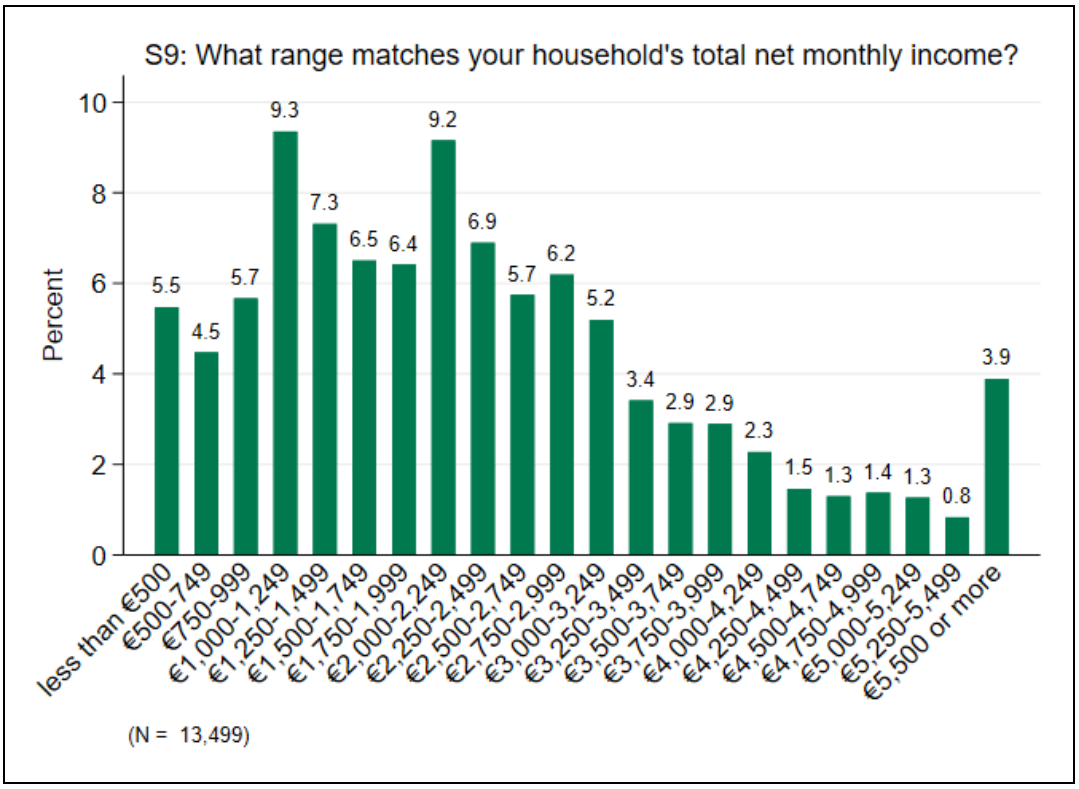

Figure 5: Income distribution all countries (S9)

[1] In this as well as in any following boxplot diagram, the rectangular ("box") displays the interquartile range (IQR), that is, all values greater than or equal to the first quartile and less than or equal to the third quartile. The vertical line inside the box is the median. A median refers to the value of a real-valued random variable for which 50% of all other values are less than or equal to that value and for which 50% of all other values are greater than or equal to that value. This holds analogously for the first quartile (i.e., 25% smaller and 75% larger or equal) and the third quartile (i.e., 75% smaller and 25% larger or equal). The vertical lines connecting the box with the adjacent lines on the left and right are called whiskers. They cover all values outside the box that are $1.5 \times IQR$ less than the first or greater than the third quartile, respectively. As the whiskers are based on data points and not the actual IQR length, their own length may vary on both sides. The adjacent lines are the whisker range's minimum or maximum, respectively. Consequently, all dots outside the whisker range represent outliers.

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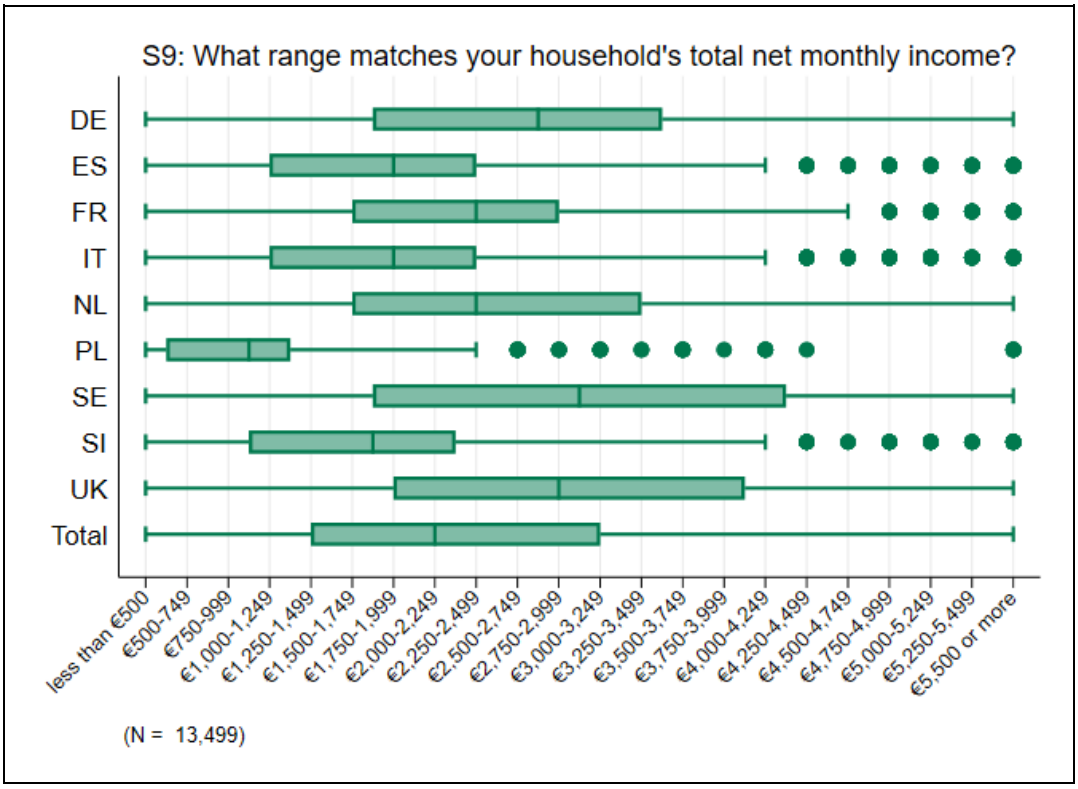

Figure 6: Income distribution across countries (S9)

Households with two persons make up the largest portion in the household size distribution with 34.37% (**Figure 7**). Meanwhile, the largest share of participants (37.93%) indicates to not have any children; however, this also means that the majority of the respondents do have children (**Figure 8**). **Table 3** shows that the total mean household size is 2.74 and the mean number of children is 1.22. On average, the household size of the survey participants in Italy is largest with 3.10, yet it stands out that the mean number of children in Italy is the lowest among the nine countries with 1.03. The United Kingdom has the highest mean number of children with 1.39.

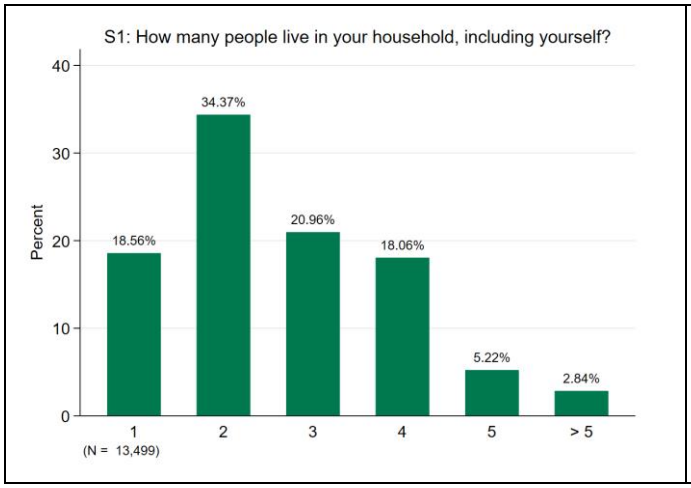

Figure 7: Household size distribution (S1)

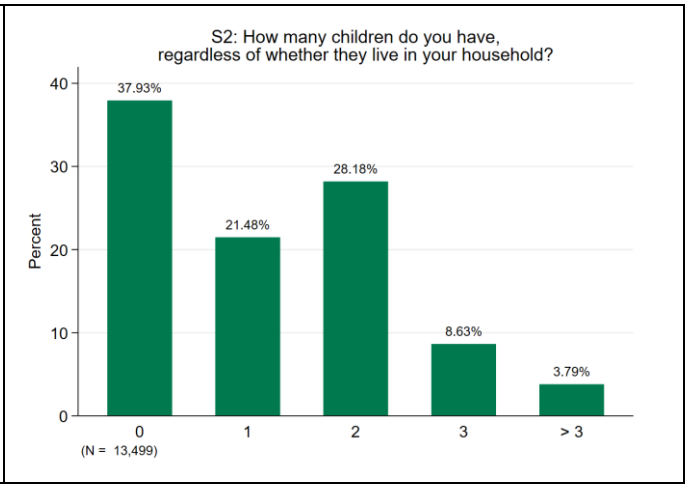

Figure 8: Distribution of number of children among participants (S2)

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Table 3: Summary statistics for household sizes and children (S1, S2)

Country	Variable	Mean	Std. dev.	Median	Min	Max
DE	Household size	2.33	1.31	2	1	26
	No. of children	1.06	1.24	1	0	8
ES	Household size	2.98	1.61	3	1	28
	No. of children	1.17	1.90	1	0	62
FR	Household size	2.65	1.34	2	1	19
	No. of children	1.27	1.26	1	0	7
IT	Household size	3.10	2.21	3	1	26
	No. of children	1.03	1.08	1	0	15
NL	Household size	2.51	1.62	2	1	26
	No. of children	1.31	1.56	1	0	24
PL	Household size	2.97	2.18	3	1	33
	No. of children	1.34	1.18	1	0	9
SE	Household size	2.28	1.66	2	1	28
	No. of children	1.12	1.28	1	0	9
SI	Household size	3.02	2.13	3	1	25
	No. of children	1.29	1.07	1	0	6
UK	Household size	2.81	1.88	2	1	32
	No. of children	1.39	1.46	1	0	14
Total	**Household size**	**2.74**	**1.82**	**2**	**1**	**33**
	No. of children	**1.22**	**1.36**	**1**	**0**	**62**

Regarding their political orientation, on a scale from 0, being "far left", and 10, being "far right", out of the participants who identify their political views on the scale (N = 9,423), the biggest group (22.20%) describes it with a value of 5 (**Figure 9** and **Figure 10**). The mean value on the scale is 5.13. The proportions decrease towards both ends of the scale. There do not seem to be great variations across countries.

Amongst those who do not reveal their political position on the scale from far left to far right, about half of the sample (51.05%) indicate to be not interested in politics. Another 34.67% cannot find their position on this presented type of scale and 14.28% do not wish to disclose their political views.

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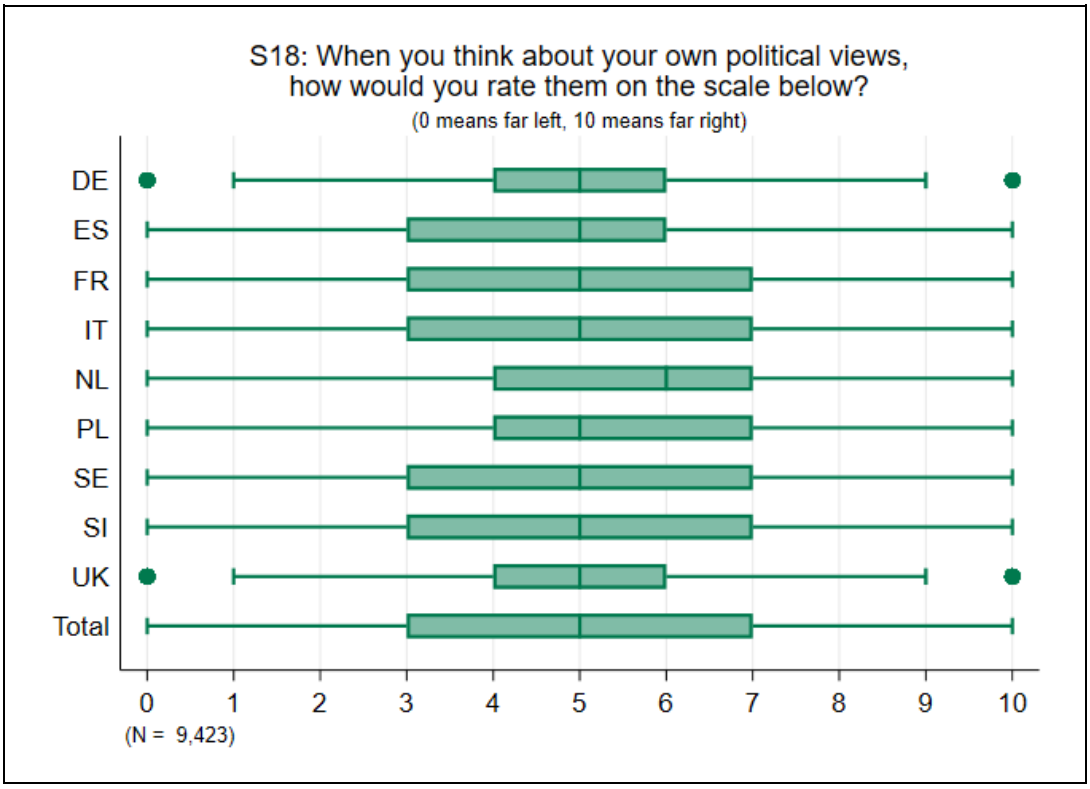

Figure 9: Political orientation (S18)

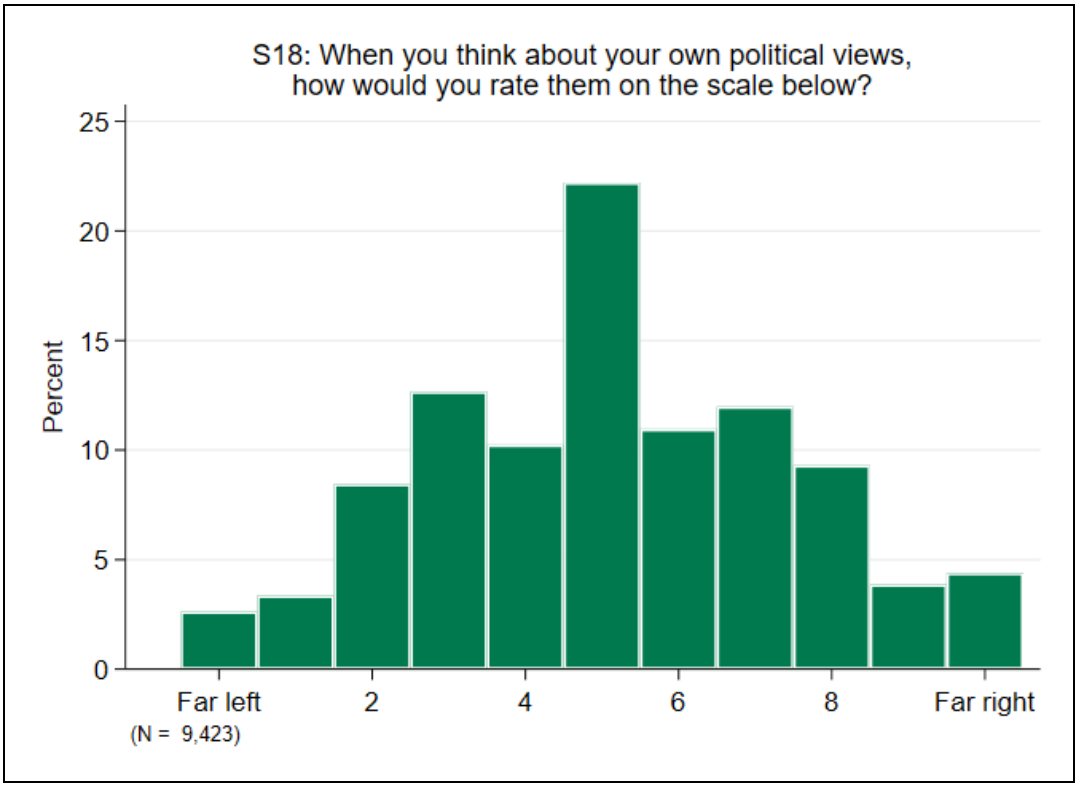

Figure 10: Political orientation (S18)

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2.5.2 Representativeness of sample

This survey study aims at being as representative as possible for the whole population of its nine participating countries. Participants were selected randomly from large samples of registered users that participate in the surveys on mingle in each country. In order to avoid biases by self-selection of certain subgroups and consequently overrepresentation thereof, quotas for socioeconomic characteristics of participants were set that represent the actual distribution of these in each country. Target quotas for the variables age, gender and education originate from Eurostat (year 2020), while quotas for the unequivalized net household incomes was collected from European Social Survey (ESS, year 2018). Hence, quotas always originated from the same source for all countries per variable, which is advantageous in terms of comparability.

Overall, it can be said that, while not perfect, this procedure led to a set of samples that could be considered representative to a substantial degree for all nine countries. For a detailed comparison between the data sample and the target distributions, this section begins with the age distribution. It overwhelmingly corresponds to the target age distribution and is therefore well representative in Spain, France, Italy, Poland, Sweden, and Slovenia. In Germany, the Netherlands and the United Kingdom persons between 18 and 29 years of age are slightly underrepresented, ranging from -3.15 percentage points in Germany to -4.63 percentage points in the United Kingdom (**Table 4**, **Table 5**, **Table A.3** and **Table A.4**).

Table 4: Relative target and sample age distribution per country (S4)

Country	Relative target age distribution					Relative sample age distribution				
	18-29 years	30-39 years	40-49 years	50-59 years	60-69 years	18-29 years	30-39 years	40-49 years	50-59 years	60-69 years
DE	20.15%	19.17%	18.10%	23.90%	18.68%	17.00%	19.33%	18.13%	26.20%	19.33%
ES	18.18%	18.97%	24.35%	21.87%	16.63%	18.00%	18.87%	24.13%	22.13%	16.87%
FR	21.41%	19.40%	20.04%	20.51%	18.65%	21.13%	19.27%	20.00%	20.47%	19.13%
IT	18.21%	17.21%	22.44%	23.64%	18.49%	17.80%	17.20%	22.87%	23.67%	18.47%
NL	22.89%	18.40%	18.91%	21.69%	18.11%	18.95%	19.01%	19.55%	22.41%	20.08%
PL	19.80%	22.61%	20.76%	17.33%	19.49%	19.80%	22.67%	20.73%	17.33%	19.47%
SE	23.42%	20.64%	19.61%	19.60%	16.74%	23.27%	20.67%	19.60%	19.60%	16.87%
SI	17.78%	20.13%	21.52%	21.13%	19.44%	17.73%	20.13%	21.53%	21.13%	19.47%
UK	23.56%	20.13%	19.65%	20.44%	16.23%	18.93%	21.13%	21.00%	21.67%	17.27%

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Table 5: Deviation of age distribution in percentage points per country (S4)

Country	18-29 years	30-39 years	40-49 years	50-59 years	60-69 years
DE	-3.15%	0.16%	0.03%	2.30%	0.65%
ES	-0.18%	-0.10%	-0.22%	0.26%	0.24%
FR	-0.28%	-0.13%	-0.04%	-0.04%	0.48%
IT	-0.41%	-0.01%	0.43%	0.03%	-0.02%
NL	-3.94%	0.61%	0.64%	0.72%	1.97%
PL	0.00%	0.06%	-0.03%	0.00%	-0.02%
SE	-0.15%	0.03%	-0.01%	0.00%	0.13%
SI	-0.05%	0.00%	0.01%	0.00%	0.03%
UK	-4.63%	1.00%	1.35%	1.23%	1.04%

Regarding gender distribution, the sample matches the target distribution in all nine countries except for Italy and Sweden. In both countries, the proportion of female participants is higher than targeted, with +1.66 percentage points in Italy and +4.43 percentage points in Sweden (**Table 6** and **Table A.5**).

Table 6: Relative target and sample gender distribution as well as the deviation in percentage points per country (S3)

Country	Relative target gender distribution		Relative sample gender distribution		Deviation in percentage points	
	Female	Male	Female	Male	Female	Male
DE	49.53%	50.47%	49.47%	50.53%	-0.06%	0.06%
ES	50.14%	49.86%	50.13%	49.87%	-0.01%	0.01%
FR	51.06%	48.94%	51.13%	48.87%	0.07%	-0.07%
IT	50.27%	49.73%	51.93%	48.07%	1.66%	-1.66%
NL	49.80%	50.20%	49.77%	50.23%	-0.03%	0.03%
PL	50.46%	49.54%	50.47%	49.53%	0.01%	-0.01%
SE	48.97%	51.03%	53.40%	46.60%	4.43%	-4.43%
SI	48.18%	51.82%	48.20%	51.80%	0.02%	-0.02%
UK	50.27%	49.73%	50.27%	49.73%	0.00%	0.00%

In Germany, the education distribution of the sample corresponds to the target distribution. In all other eight countries, however, persons with below upper secondary education are mildly to severely underrepresented in the sample. The deviation ranges from -3.20 percentage points in the United Kingdom to -13.33 percentage points in Italy (**Table 7**, **Table 8**, **Table A.6** and **Table A.7**). The deficit of respondents with below upper secondary education is matched by a higher proportion of participants with upper secondary or post-secondary education.

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Table 7: Relative target and sample distribution of education levels per country (S8)

Country	Relative target distribution of education levels			Relative sample distribution of education levels		
	Below upper secondary education (ISCED 0-2)	Upper secondary or post-secondary non-tertiary education (ISCED 3-4)	Tertiary education (ISCED 5-8)	Below upper secondary education (ISCED 0-2)	Upper secondary or post-secondary non-tertiary education (ISCED 3-4)	Tertiary education (ISCED 5-8)
DE	19.50%	54.50%	26.00%	19.53%	54.47%	26.00%
ES	39.60%	25.30%	35.10%	29.33%	35.00%	35.67%
FR	23.40%	42.80%	33.80%	11.93%	54.20%	33.87%
IT	39.80%	42.80%	17.40%	26.47%	54.40%	19.13%
NL	25.50%	39.70%	34.80%	17.14%	46.70%	36.16%
PL	13.30%	58.50%	28.20%	6.13%	65.67%	28.20%
SE	20.80%	41.50%	37.80%	14.93%	50.47%	34.60%
SI	15.80%	54.90%	29.30%	3.93%	66.73%	29.33%
UK	19.20%	40.20%	40.60%	16.00%	42.13%	41.87%

Table 8: Percentage point differences between target and sample distribution of education levels per country (S8)

Country	Below upper secondary education (ISCED 0-2)	Upper secondary or post-secondary non-tertiary education (ISCED 3-4)	Tertiary education (ISCED 5-8)
DE	0.03%	-0.03%	0.00%
ES	-10.27%	9.70%	0.57%
FR	-11.47%	11.40%	0.07%
IT	-13.33%	11.60%	1.73%
NL	-8.36%	7.00%	1.36%
PL	-7.17%	7.17%	0.00%
SE	-5.87%	8.97%	-3.20%
SI	-11.87%	11.83%	0.03%
UK	-3.20%	1.93%	1.27%

As depicted in **Table 9**, **Table A.8**, and **Table A.9**, the sample's income distribution is very well met in all nine countries. It corresponds perfectly to the target distribution in Germany, Poland, Sweden and Slovenia and it almost perfectly corresponds to the target distribution in Spain and the Netherlands. Only small deviations can be found in Italy, France, and the United Kingdom, with the highest deviation in Italy with -1.13 percentage points. Here, high-income earners are slightly underrepresented.

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Table 9: Quartile definitions, relative sample income distribution and deviation in percentage points per country (S9)

Country	Unequivalized income quartiles (in national currencies)			Relative sample income distribution				Deviation in percentage points			
	1st top cut-off point (T-1)	2nd top cut-off point (T-2)	3rd top cut-off point (T-3)	1	2	3	4	1	2	3	4
DE	1,749	2,749	3,499	25.00%	25.00%	25.00%	25.00%	0.00%	0.00%	0.00%	0.00%
ES	1,249	1,999	2,499	25.07%	25.00%	25.00%	24.93%	0.07%	0.00%	0.00%	-0.07%
FR	1,749	2,499	2,999	25.53%	25.00%	24.60%	24.87%	0.53%	0.00%	-0.40%	-0.13%
IT	1,249	1,999	2,499	25.33%	26.80%	24.00%	23.87%	0.33%	1.80%	-1.00%	-1.13%
NL	1,749	2,499	3,249	25.02%	25.02%	24.95%	25.02%	0.02%	0.02%	-0.05%	0.02%
PL	2,999	4,999	5,999	25.00%	25.00%	25.00%	25.00%	0.00%	0.00%	0.00%	0.00%
SE	17,499	29,999	42,499	25.00%	25.00%	25.00%	25.00%	0.00%	0.00%	0.00%	0.00%
SI	999	1,749	2,249	25.00%	25.00%	25.00%	25.00%	0.00%	0.00%	0.00%	0.00%
UK	1,649	2,449	3,249	25.80%	25.00%	24.20%	25.00%	0.80%	0.00%	-0.80%	0.00%

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2.5.3 Living conditions

Next, the living conditions of the participants are presented, which can be assumed to play a role in decisions and possibilities of joining energy communities as well as generating electricity at home, such as through solar panels. As **Figure 11** shows, the majority of survey participants from all countries live in cities, towns, or suburbs, whereas only a smaller fraction lives in rural areas. The highest rate of urbanisation can be found in Spain, where only 6.27% of the participants indicate to come from a rural area (**Table A.10**). In the other countries, the share of participants from rural areas is larger, especially in Germany and France with 29.27% and 35.27%, respectively.

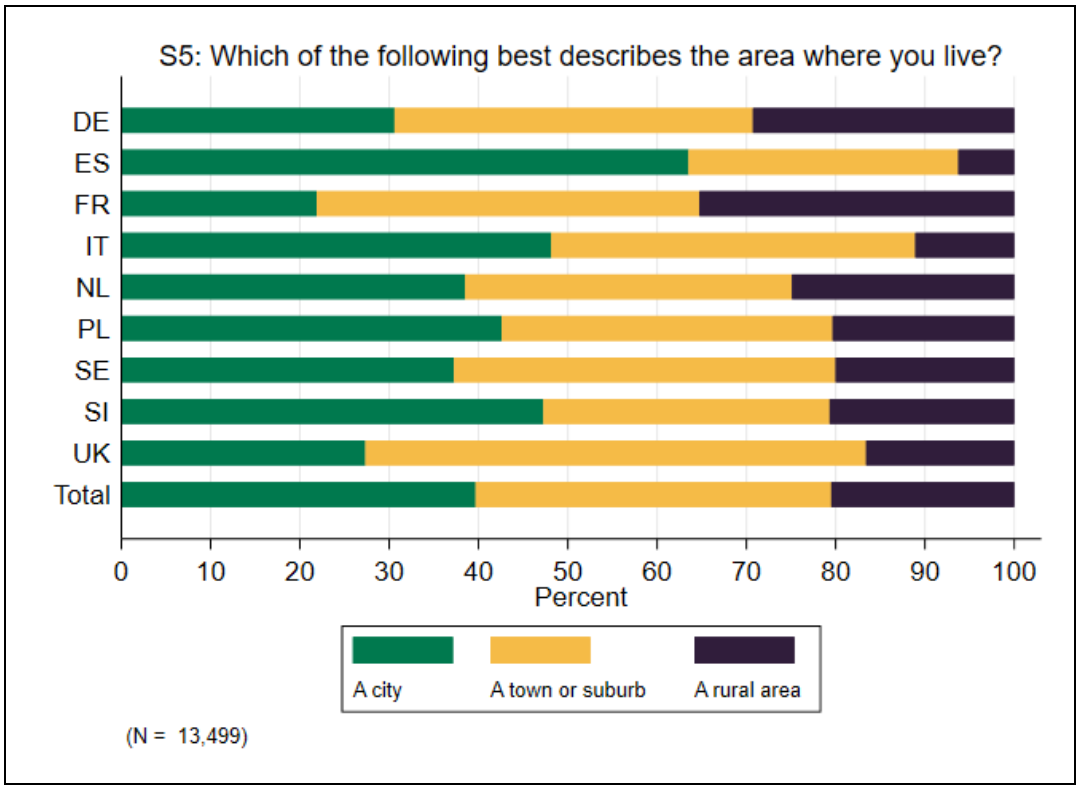

Figure 11: Living areas (S5)

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In all countries except for Germany and Sweden, more than half of the participating sample own the dwelling they live in (**Figure 12**). Germany stands out with the highest rate of people living in rented dwellings with 63.13%, followed by Sweden with 50.47% (**Table A.11**).

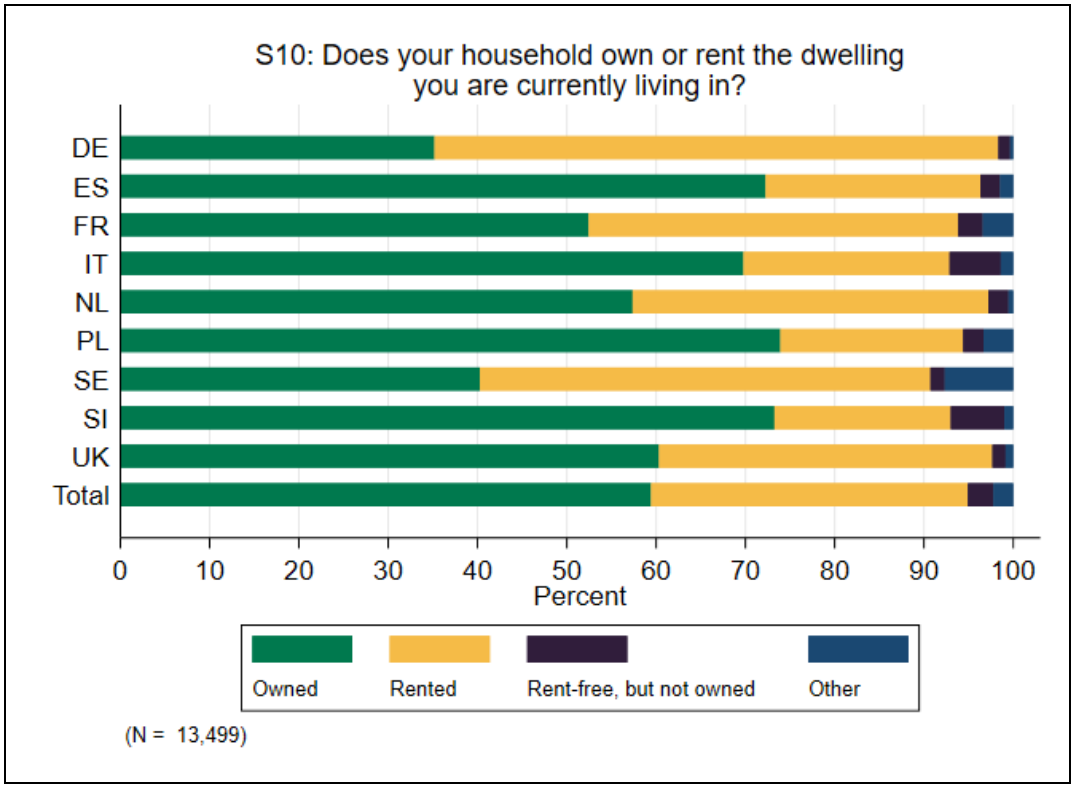

Figure 12: Home rented or owned (S10)

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As depicted in **Figure 13**, detached homes and apartments are the most common type of buildings to live in, except for the Netherlands and the United Kingdom, where semi-detached and terraced houses constitute the largest proportions in the type of buildings (**Table A.12**).

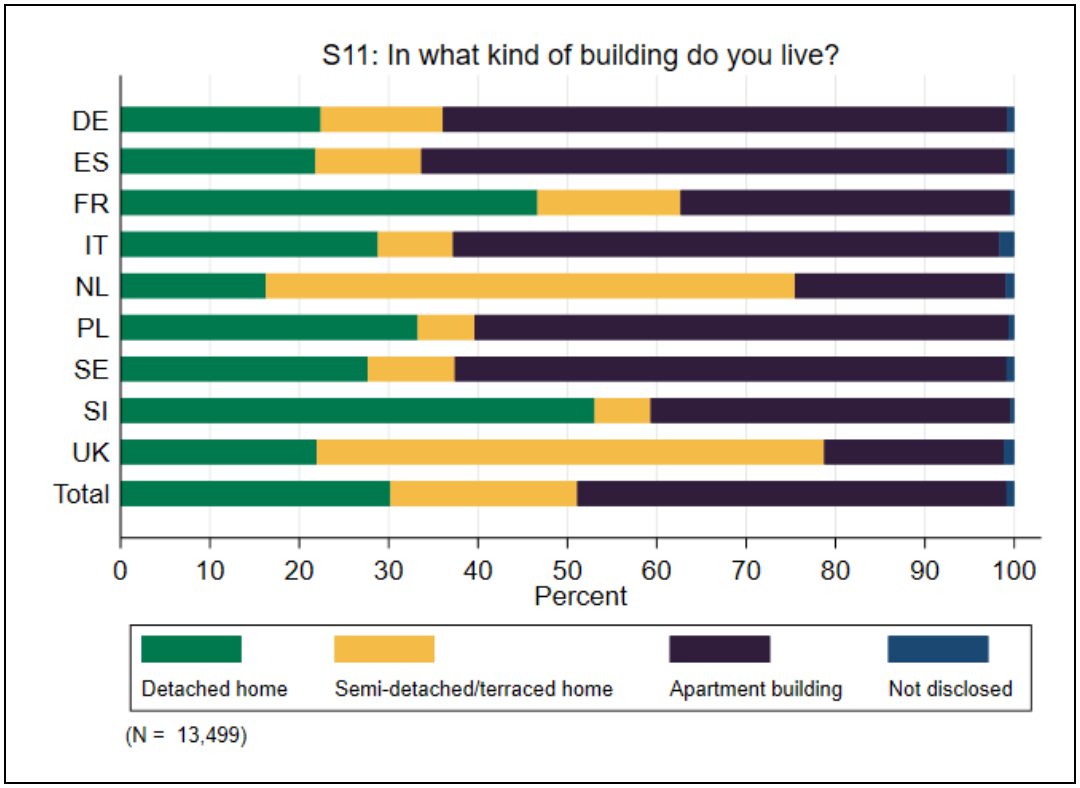

Figure 13: Type of building (S11)

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While in the Netherlands more than half (51.03%) of the respondents indicate to have a green electricity tariff, the share is lower in the other eight countries, varying from 31.33% in Germany to only 10.80% in France (**Figure 14** and **Table A.13**). However, there is also a substantial share of people who do not know whether they have a green tariff. This share varies from 6.73% in Poland to 37.40% in Sweden.

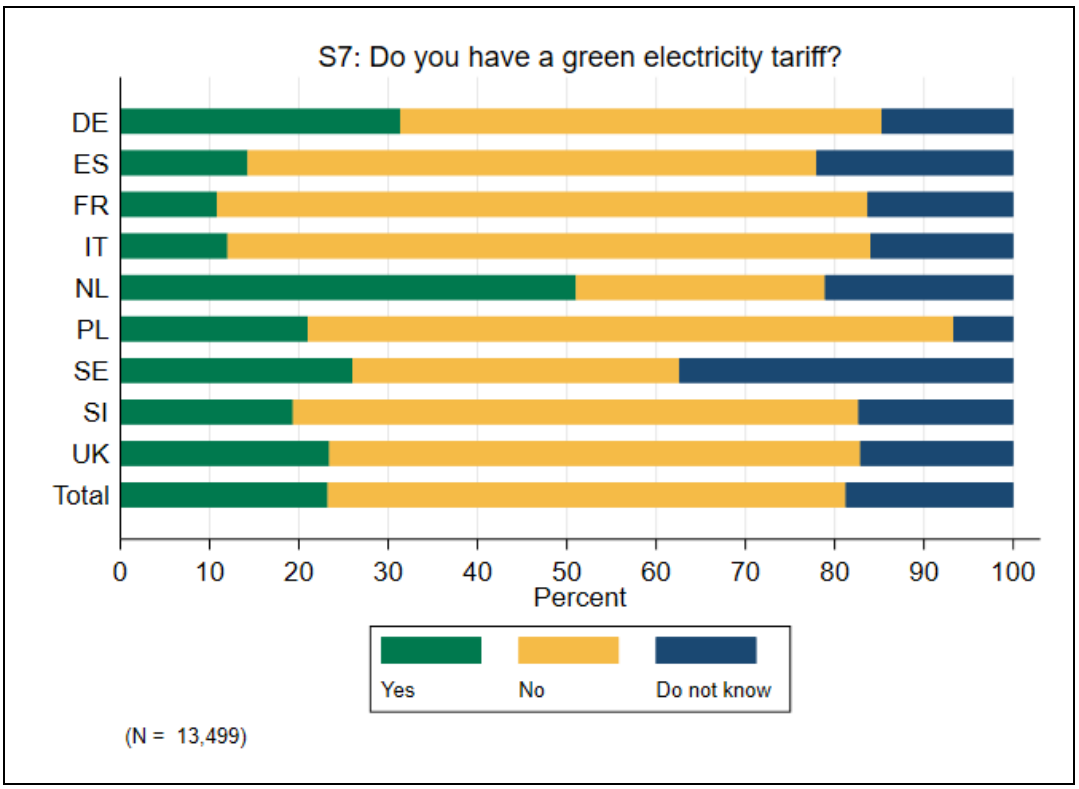

Figure 14: Green electricity tariff (S7)

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The share of participants who state to have solar panels on their roofs is by far the highest in the Netherlands with 32.35% (**Figure 15** and **Table A.14**). Poland comes in the second place with 12.33% and in France the share is the lowest with only 6.67%.

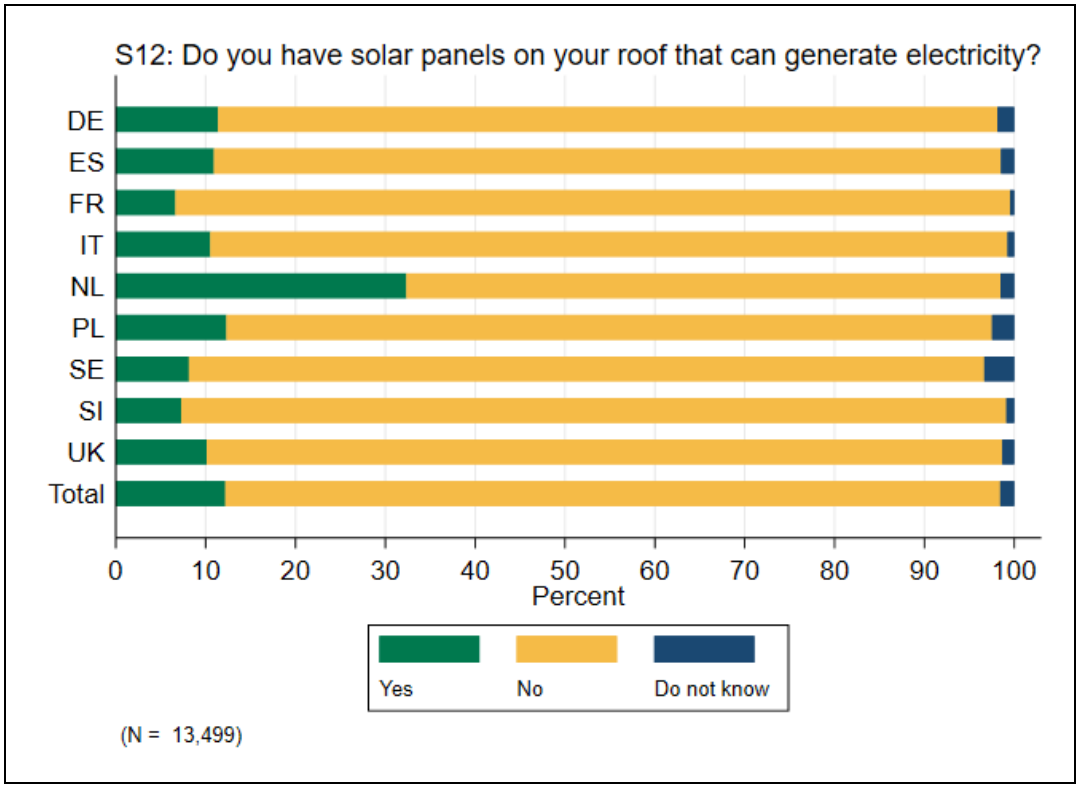

Figure 15: Solar panels (S12)

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It seems that, in principle, a substantial share of houses in all countries that are not currently equipped with solar panels for electricity generation would allow the installation of these on their rooftops (varying from 28.21% in France to 48.60% in Slovenia) (**Figure 16** and **Table A.15**). The main reason that is stated against this possibility is that the survey participant is not the one who can make such a decision, whereas only a smaller share of participants (ranging from 6.70% in Germany to 15.29% in Poland) actually rule out this option for physical reasons.

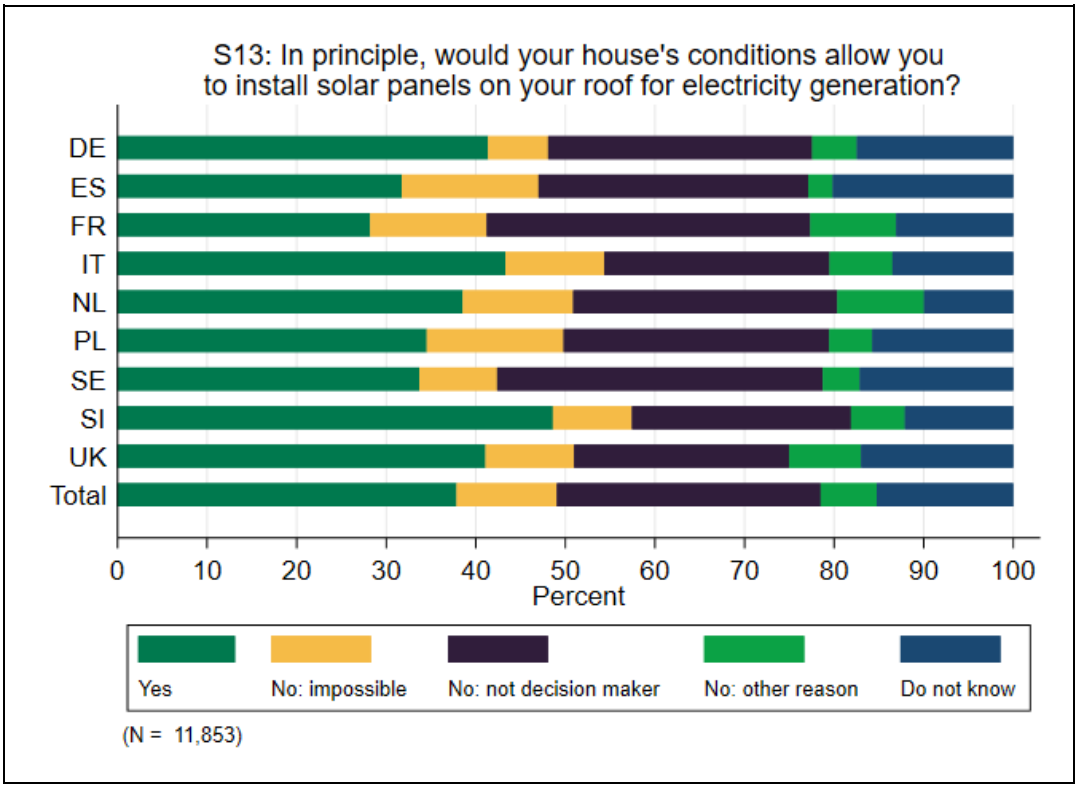

Figure 16: Conditions for solar panels (S13)

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3 RESULTS

The "Results" chapter constitutes the main part of this report and starts with presenting the outcomes from asking participants about their general attitudes concerning environment, climate change and the energy transition. It follows the quiz on energy literacy before results of specific questions about energy communities are presented. Finally, the experiments are explained, and the respective results are illustrated.

3.1 AB – Attitudes and behaviour with respect to the energy transition

The AB section of the survey investigates the respondents' views on environmental topics such as climate change, energy efficiency, energy security, environmental policies, and fairness aspects.

In the first question of this section (AB1), the participants are asked how important it is to them personally to protect the environment. As displayed in **Figure 17**, Italy has the highest share of "very important" responses with 68.07% relative to the other countries (**Table A.16**). While Italy has the lowest share of "not at all important" and "not very important" responses with 1.87% in total, the Netherlands has the highest share of those answers with 11.60% in total. At the same time, the Netherlands have the smallest share of "very important" with 31.29%. Yet, this observation is mitigated by the fact that the Netherland's share of "fairly important" responses with 57.10% supersedes those of all other countries.

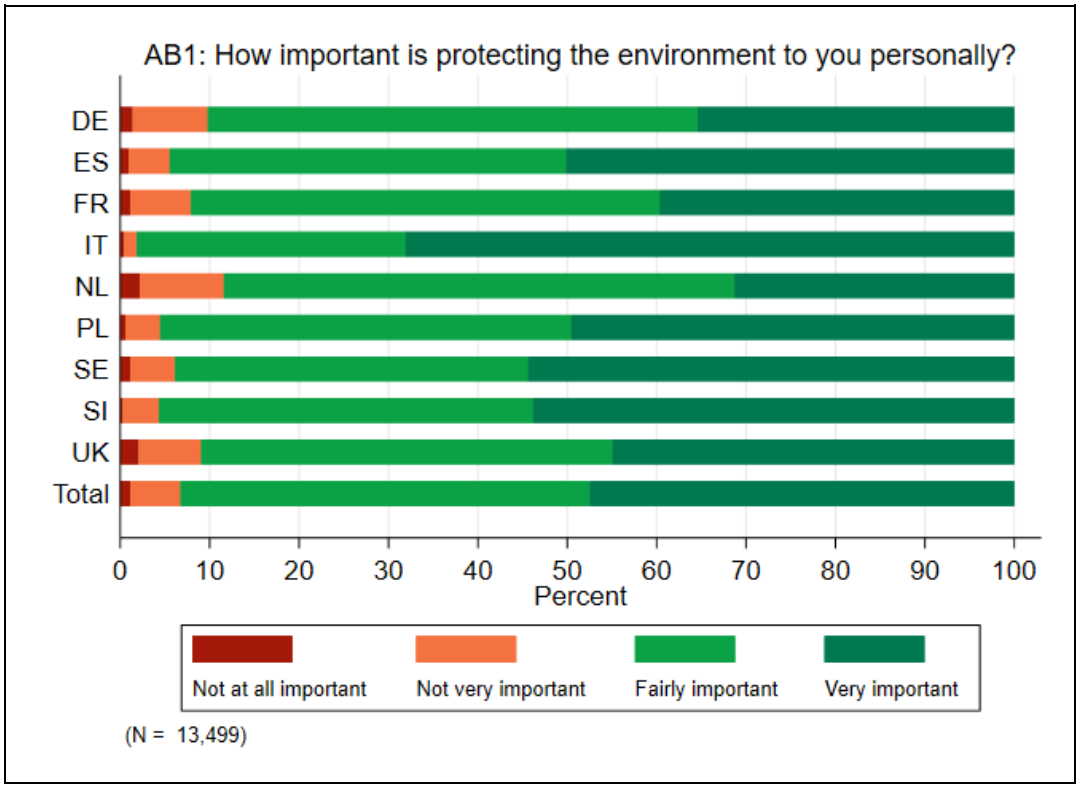

Figure 17: Importance of protecting the environment (AB1)

AB2 (**Figure 18**) deals with the question of how serious a problem the participants think climate change is at the moment. On a scale of 1 (considering climate change to not at all be a serious problem) to 10 (climate change being an extremely serious problem) the mean across the entire sample is found at 7.98 (**Table A.17**). The largest proportion of the entire sample (31.28%) rate the seriousness with a value of 10, i.e., climate change being an "extremely serious problem", while only 1.95% of the entire

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sample rate it a 1, i.e., "not at all a serious problem". On average, the survey respondents from Italy rate the seriousness of climate change as a problem the highest with a mean of 8.82. In Italy, 46.73% of the participants reply with a value of 10, as opposed to 14.08% of the participants from the Netherlands considering the seriousness a 10. The participants from the Netherlands also rate the seriousness of climate change as a problem the lowest with a mean of 7.31.

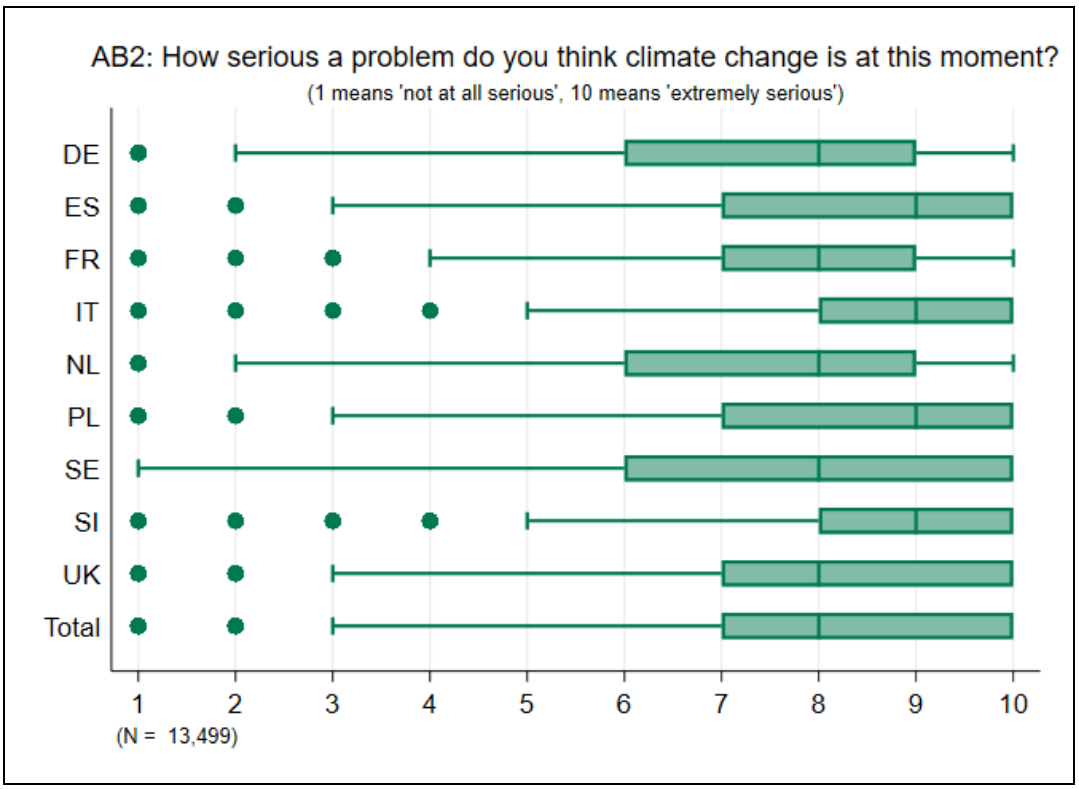

Figure 18: Seriousness of climate change as a problem (AB2)

In AB3, AB4, AB6 and AB9, the participants are asked how much they agree or disagree with specific energy-related statements. Regarding the statement "Many of my peers use electricity generated from renewable energy sources" (AB3a), the results are ambiguous (**Figure 19**). The largest share of participants (44.67%) state that they "neither agree nor disagree" with the statement (**Table A.18**). 5.56% of all participants "strongly agree", on the other hand, 9.58% "strongly disagree". Country-wise, in the Netherlands the share of participants who either "agree" or "strongly agree" is highest at a total of 30.89%, whereas it is the lowest with 11.07% of the participants from France. Similarly, in France, the share of survey respondents who either "disagree" or "strongly disagree" is highest with a total of 53.33%. Responding to the statement "It is our responsibility to move to renewable energy sources" (AB3b), 71.84% of all participants either "agree" (43.60%) or "strongly agree" (28.24%), with similar results across all nine countries. In reply to the statement "Public institutions should be a role model in switching to clean energy sources" (AB3c), the total share of participants who either "agree" or "strongly agree" is even higher compared to the previous statement. Almost half of the entire participating sample (44.91%) "strongly agree".

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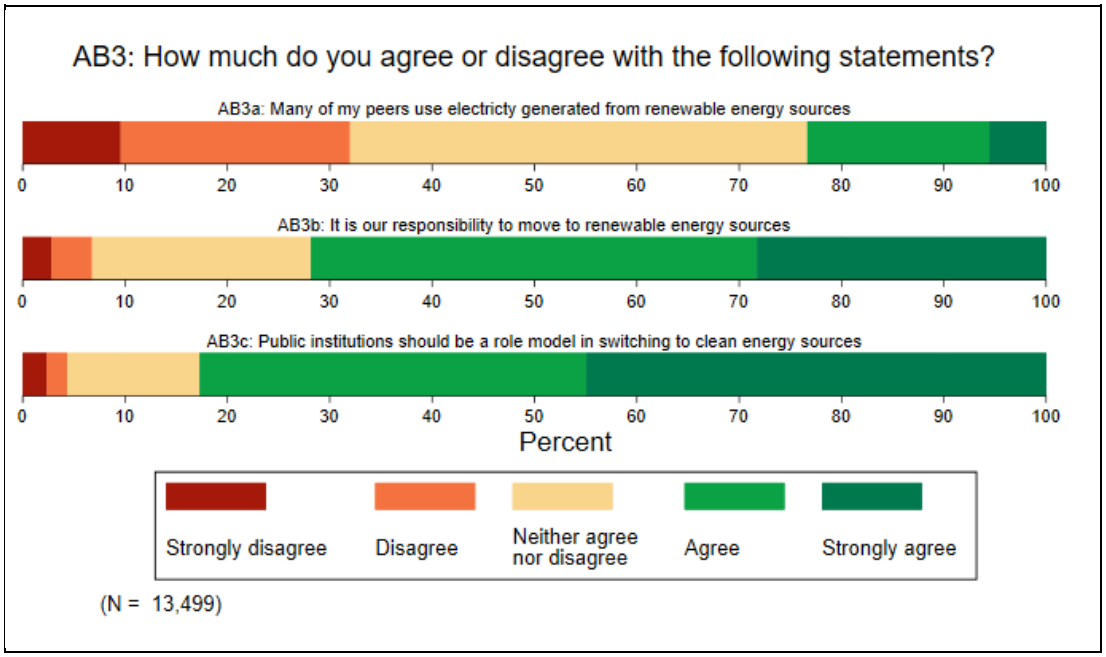

Figure 19: Agreement with statements regarding the use of renewable energy sources (AB3)

Figure 20 shows that the majority of all participants either "disagree" (36.70%) or "strongly disagree" (29.53%) with the statement "Energy efficiency and conservation just isn't that important to me" (AB4a) (**Table A.19**). Similarly, responding to the statement "When home, I take actions to conserve energy" (AB4b), 48.81% "agree" and 32.71% "strongly agree". Continuing with the theme of energy conservation at home, more than half of the participating sample (a total of 53.42%) either "disagree" or "strongly disagree" with the statement "There is very little I can do personally to conserve energy in my home" (AB4c). The results for the following statement "I am not willing to conserve energy at home if that comes at any cost to my comfort" (AB4d) are similar with a total of 53.66% of the respondents who either "disagree" or "strongly disagree". "Energy efficiency is vital to our national economy" (AB4e) is a statement with which a total of 75.45% of the participants either "agree" or "strongly agree". A total of 80.03% either "agree" or "strongly agree" with the statement "The government has a strong role to play in our nation's energy efficiency and conservation policies" (AB4f). The respondents have mixed opinions about the statement "Clean energy is more important than reliable and affordable energy" (AB4g). The largest share of participants (37.48%) state that they "neither agree nor disagree" with the statement, followed by 32.79% of the participants who "agree". Italy has the highest proportion of participants (a total of 64.40%) who "agree" or "strongly "agree" with the statement, while having the lowest share of participants who "disagree" or "strongly disagree" with a total of 5.40%. On the contrary, Germany has the lowest share of participants (a total of 35.87%) who "agree or "strongly agree" with the statement, while they also have the highest share of participants who "disagree" or "strongly disagree" with a total of 24.27%. Responding to the statement "Becoming an energy independent country is vital to our economic success and national security" (AB4h), a total of 70.15% of all participants either "agree" or "strongly "agree".

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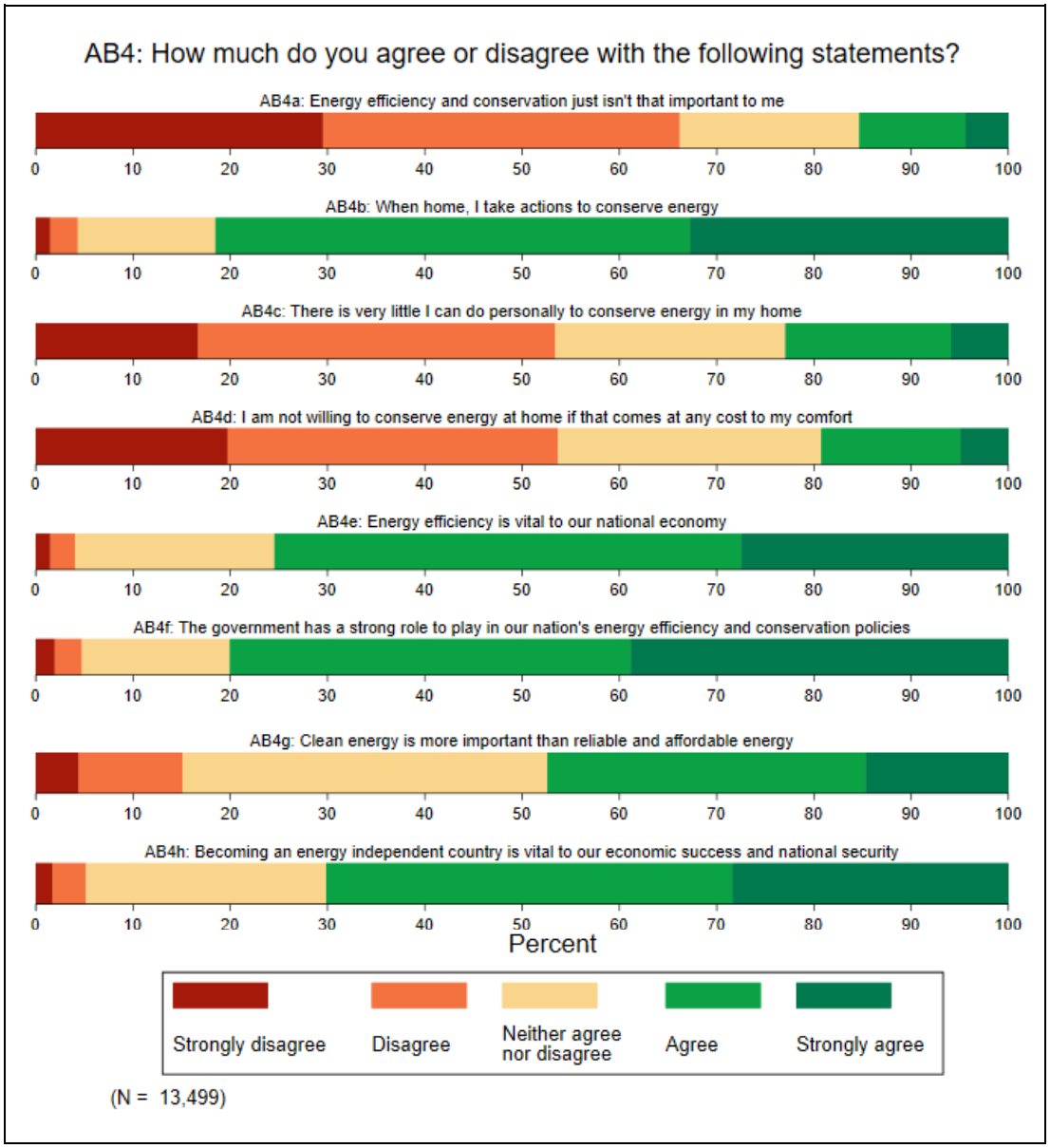

Figure 20: Agreement with statements regarding energy efficiency and conservation (AB4)

AB6 (**Figure 21**) focuses on capturing the participants' opinions on specific policy measures related to the energy transition. In general, it seems that an "increase in the energy efficiency of buildings" (AB6e) is the most popular of the proposed policy measures with the largest share of all participants who "agree" (44.99%) and the largest share of participants who "strongly agree" (37.09%) with the measure (**Table A.20**). Meanwhile, "Nuclear phase out / refraining from the use of nuclear energy for electricity generation" (AB6a) seems to be the least popular presented policy measure, with the highest share of all participants who "disagree" (12.15%) and the highest share of all participants who "strongly disagree" (10.76%). Especially Sweden stands out here, with 14.73% of the participants who "disagree" and 23.80% of the participants who "strongly disagree" with a nuclear phase-out. Across the entire sample, it is also the only one of the seven policy measures with which less than 50% either "agree" or "strongly agree" with (a total of 46.10%). On the other hand, this also means, that even though it is the least popular measure, more participants still agree with than disagree with it, except in Sweden.

As for the other policy measures, a total of 67.65% of the respondents either "agree" or "strongly agree" with a "coal phase-out" (AB6b). A total of 75.57% of the participants either "agree" or "strongly

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agree" with the policy measures "subsidies for renewable energy generation" (AB6c) and, in a similar pattern, 65.08% of the participants "agree" or "strongly agree" with the "expansion of power grids" (AB6d). Regarding the policy measure "expansion of public transport" (AB6g), a total of 72.14% fall into this category. The "expansion of electric vehicles" (AB6f) seems to be the second most controversial measure among the survey participants, with a total of 15.90% of the respondents who either "disagree" or "strongly disagree". There are notable country differences; in Germany, a total of 29.07% of the participating sample either "disagree" or "strongly disagree" with the measure, while in Italy only 8.33% of the participants fall into this category. Across the whole sample, a total of 58.07% still either "agree" or "strongly agree" with the expansion of electric vehicles. It should be noted that across all subitems in AB6, the share of "neither agree nor disagree" is relatively large with up to more than 30% of answers, also, and especially so, for the nuclear phase-out.

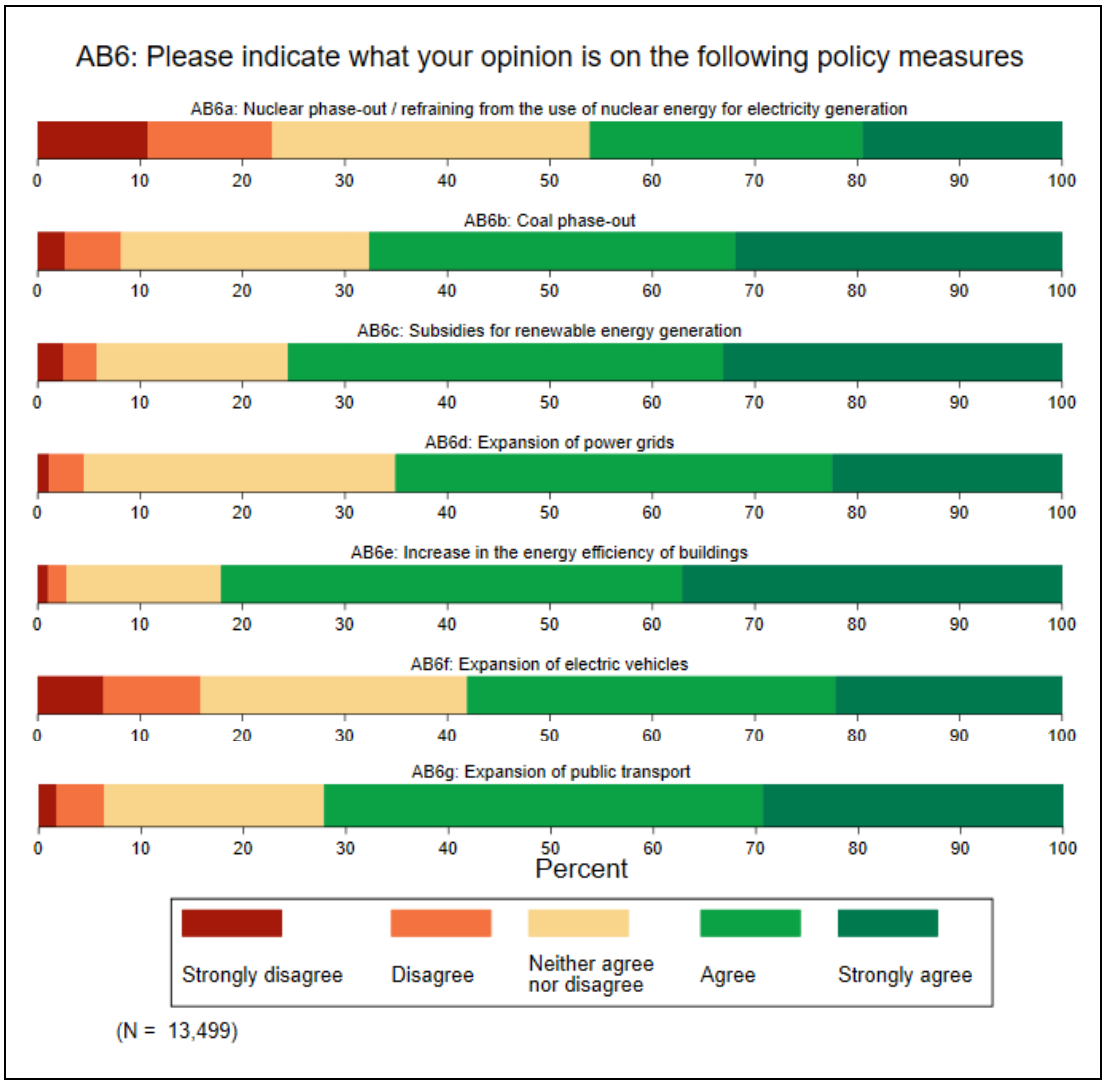

Figure 21: Opinion on policy measures (AB6)

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AB9 (**Figure 22**) deals with statements regarding the distribution of energy costs in the respective countries.

In response to the first statement "Everyone should pay the same among per unit of energy consumed" (AB9a), 47.50% of the participants either "agree" or "strongly agree" (**Table A.21**). Meanwhile, it also seems that respondents tend to agree that "Low-income households should pay a smaller amount per unit of energy consumed" (AB9b), with a total of 51.61% of the participating sample who either "agree" or "strongly agree". The following statements, "To be internationally competitive, high-energy consuming industry should pay a smaller amount per unit of energy consumed" (AB9c) and "For a fairer energy transition, our society should accept higher costs" (AB9d), show similar results and mixed opinions with the largest share in both cases being participants who "neither agree nor disagree" with 36.81% and 36.13% respectively. For both statements, the share of respondents who "disagree" or "strongly disagree" is larger than the share of those who "agree" or "strongly agree".

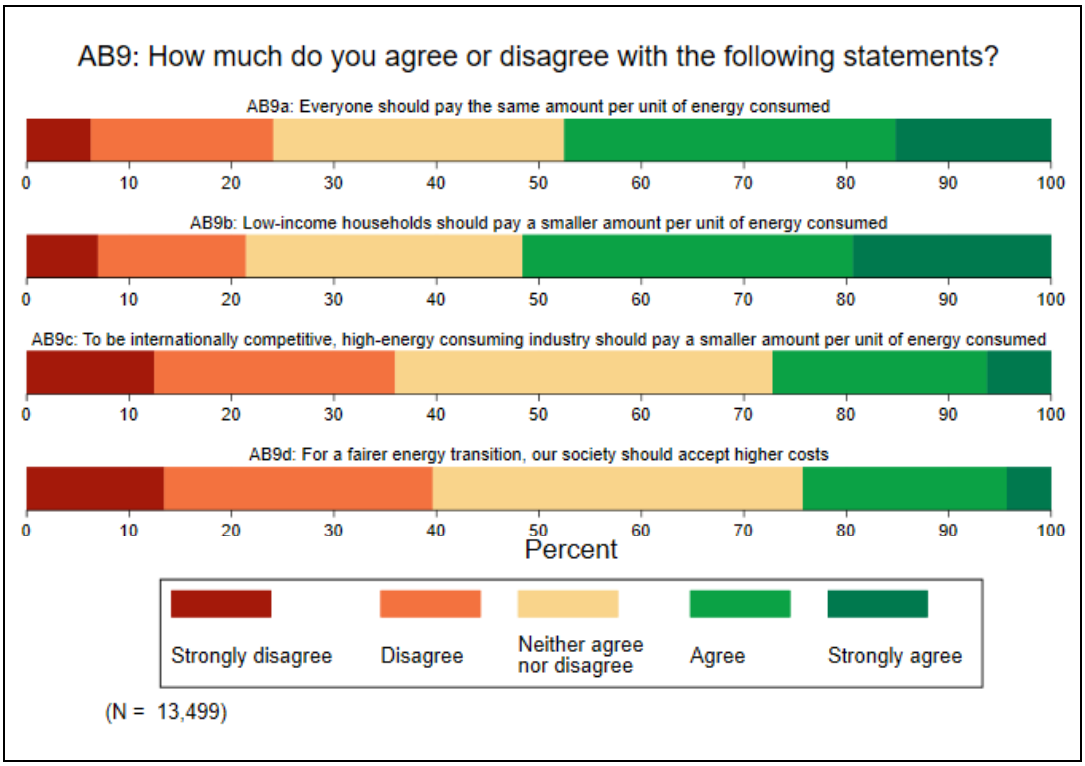

Figure 22: Agreement with statements regarding the distribution of energy costs in the country (AB9)

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As shown in **Figure 23**, when asked about their opinion on the fairness of the distribution of costs in connection with the energy transition in their country, across the whole sample, the largest share of participants (27.46%) say it is "neither fair nor unfair" (**Table A.22**). This is closely followed by 26.94% of the survey respondents stressing it is "unfair". Only 3.62% of all participants consider it to be "very fair", while a substantial share of all respondents (17.09%) replies with "I do not know".

The share of participants who state that the distribution of costs in connection with the energy transition is "very unfair" is largest in Spain (20.13%). Germany is the only country in which more than half of the participants say that the distribution of costs is either "very unfair" or "unfair" (a total of 53.80%). In the United Kingdom, the share of participants who find the distribution of costs to be "very unfair" is lowest with 6.73%, meanwhile the share of those who believe it is either "fair" or "very fair" is the largest in the United Kingdom (a total of 25.13%).

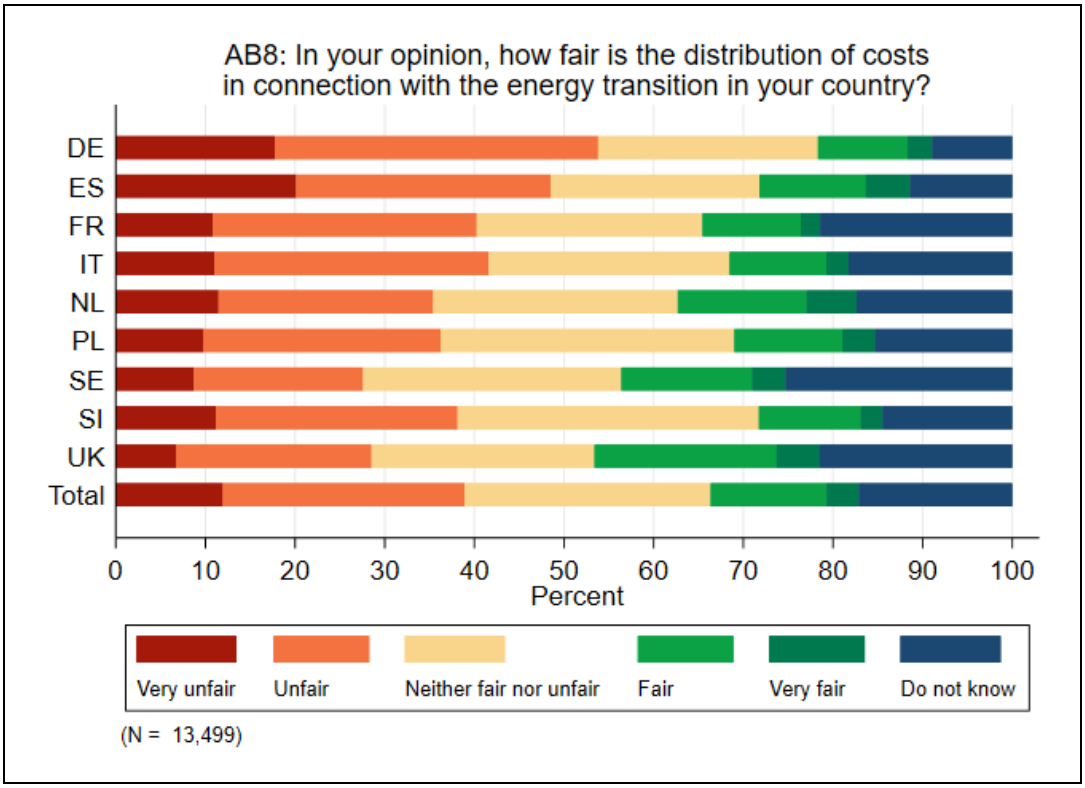

Figure 23: Opinion on fairness of the distribution of costs in connection with the energy transition in the country (AB8)

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Regarding the importance of fairness of energy policy for a successful energy transition, participants from all countries have a rather clear opinion (**Figure 24**): Almost three quarters of the participating sample (a total of 73.82%) believe that the aspect of fairness of energy policy is either "important" or even "very important" for the success of the energy transition in their country (**Table A.23**). On the other hand, only 2.79% of all respondents think it is "hardly important" and only 1.02% think it is "not at all important".

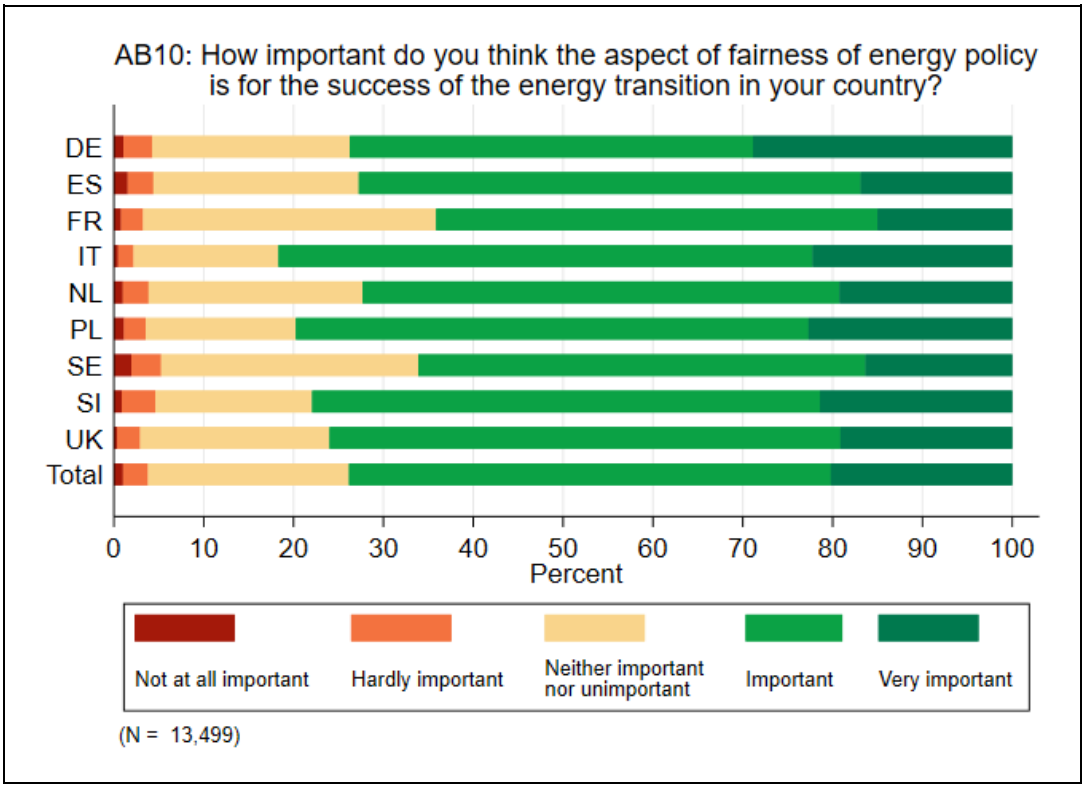

Figure 24: Perceived importance of energy policy's fairness for the energy transition's success in the country (AB10)

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3.2 EL – Energy literacy

The section Energy Literacy both asks participants for a subjective assessment of their own knowledge about energy-related topics and tests this knowledge via five general questions about energy production and consumption. Furthermore, this section includes questions about who is usually responsible for energy-related decisions in a household and evaluates whether gender tends to play a role in who is making these decisions.

Figure 25 illustrates the self-perceived level of knowledge about energy production and use across the whole sample (EL1). The particular questions and corresponding answer options can be found in the supplementary questionnaire. The three issues at hand focus on how well the participants feel informed about (a) energy issues, (b) personal energy use, and (c) how to be energy efficient. It is shown that 24.02% feel "not at all" or "hardly" informed about energy issues, while 27.02% feel "fairly well" and 6.04% feel "very well" informed (**Table A.24**). When asked about personal use, the share of very well-informed respondents more than doubles (13.13%) and those who feel fairly well-informed increase to 32.03%. In turn, the share of both roughly and hardly informed participants declines to 33.88% and 15.62%, respectively. The residual 5.33% feel not at all informed. In the last part -energy efficiency-, the share of roughly and fairly well-informed increases to 38.32% and 38.88%, respectively, while the percentage of very well-informed slightly decreases. In total, 12.86% do not at all or hardly feel informed.

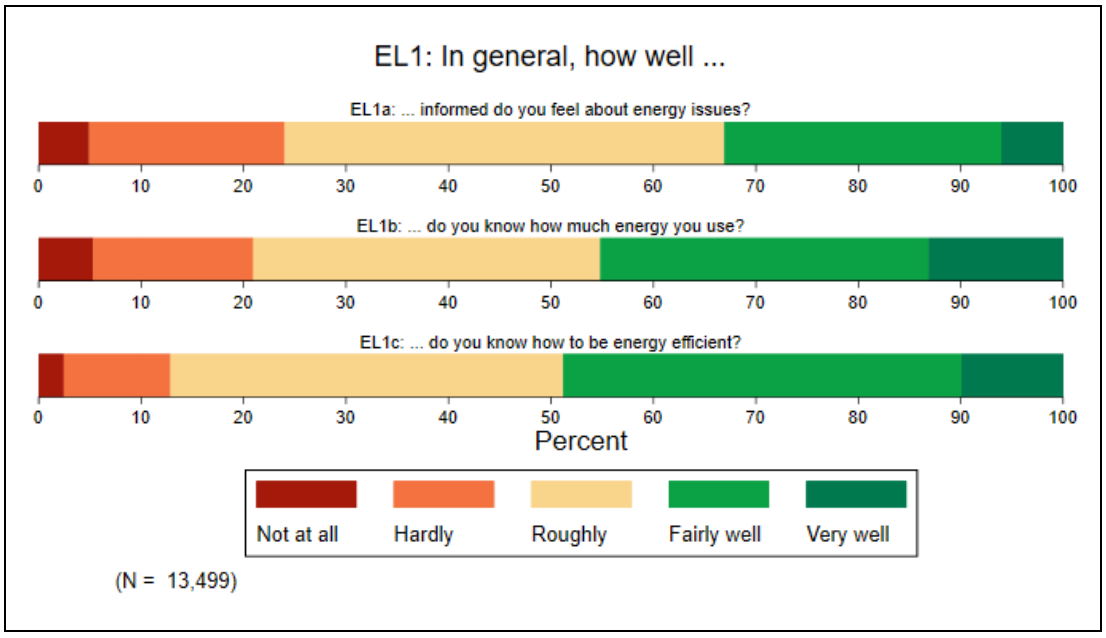

Figure 25: Level of knowledge about the production and use of energy – self-perception (EL1)

In the question blocks EL2 to EL6, the actual, in contrast to the self-perceived, knowledge about energy production and use is assessed. **Table 10** delivers an overview of the questions and correct answers, and **Table 11** reveals the share of correct answers per question and country.

The first issue (EL2) deals with the most used electricity source in 2020 in each participant's country. For Germany, Spain, the United Kingdom, and Sweden the correct answer is "renewables"; for France and Slovenia "nuclear"; for Italy, the Netherlands, and Poland "fossil fuels". On average, 45.31% of all respondents know the correct answer to this question. Poland (70.80%) and France (69.40%) have the highest shares of correct answers for EL2, Germany (23.20%) and the United Kingdom (24.80%) the

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lowest. This wide range might be explainable by different overall assumptions made by the participants towards the topic of electricity in times of growing attention to energy transition. These assumptions potentially do not account for the fact that energy-source preferences might vary on a country-specific level. However, a precise inference cannot be made at this point.

EL3 asks which energy source creates the fewest carbon dioxide emissions when used to generate electricity. The correct answer for all countries is "gas". The shares of correct answers of most of the countries lie around the average of 61.12%. The United Kingdom (48.87%) stands out on the lower end, Slovenia (72.87%) and Germany (71.27%) on the opposite one.

EL4 assesses the knowledge of what uses the most energy in an average household annually. The correct answer for all countries is "heating and cooling rooms". The average share of correct answers decreases relative to EL3 by 5.95 percentage points. In general, the shares of correct replies vary by ±7 percentage points. Poland is the only exception with 46.73%.

The penultimate question (EL5) is concerned with determining who of the respondents know whether the energy use per person in their country since 2010 has decreased or increased. The correct answer for all countries but Poland is "decreased" and "increased" for Poland. When comparing all shares of EL5 but the one for Poland to the rest of EL2 to EL6, they appear conspicuously low, ranging from 4.07% (Spain) to 9.01% (the Netherlands). Yet, 77.67% of all Polish participants have answered correctly. It seems plausible that the considerably higher share of correct replies in Poland is due to the country being the only one of the nine where the use of energy is actually increasing.

The final question (EL6) asks the respondents how much they think it costs in terms of electricity to run a desktop computer for one hour. The correct answer for all countries is "< 1 kWh". On average, 32.85% of all participants know the correct reply. The minimum share is 23.28% (the Netherlands), and the maximum share is 48.67% (Slovenia).

To conclude, the average share of participants providing the correct answer about the production and use of energy across all countries and questions is 41.71%, as measured by the described issues EL2 to EL6. The minimum average is recorded for the United Kingdom (30.53%) and the maximum for Poland (60.45%; see remarks above). Spain, Sweden, Germany, and the Netherlands lie with their knowledge level slightly below average; Italy, France, and Slovenia slightly above.

Table 10: Explanation EL2-EL6

EL	Question	Correct answer
EL2	Thinking about the electricity supply in your country, which of the following was used to generate the most electricity in 2020?	Renewables (DE, ES, UK, SE) Nuclear (FR, SI) Fossil fuels (IT, NL, PL)
EL3	Which of the following energy sources creates the fewest CO2 emissions when used to generate electricity?	Gas
EL4	Which of the following uses the most energy in an average household annually?	Heating and cooling rooms
EL5	The energy use per person in your country since 2010 has ...	Decreased (all but PL) Increased (PL)
EL6	How much do you think it costs in terms of electricity to run a desktop computer for one hour?	< 1 kWh

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Table 11: Level of knowledge about the production and use of energy – assessment (EL2-EL6) in % of correct answers

Country	EL2	EL3	EL4	EL5	EL6	Total
DE	23.20	71.27	51.87	7.87	33.13	**37.47**
ES	33.47	56.20	54.40	4.07	32.87	**36.20**
FR	69.40	61.00	61.73	5.07	24.07	**44.25**
IT	49.40	60.20	61.13	4.13	42.87	**43.55**
NL	50.03	52.84	57.44	9.01	23.28	**38.52**
PL	70.80	67.20	46.73	77.67	39.87	**60.45**
SE	40.20	59.67	54.80	6.73	24.73	**37.23**
SI	46.53	72.87	59.80	7.87	48.67	**47.15**
UK	24.80	48.87	48.60	4.27	26.13	**30.53**
Total	**45.31**	**61.12**	**55.17**	**14.08**	**32.85**	**41.71**

As it is depicted in **Figure 26**, in response to the question of who typically takes care of energy-related decisions in the participants' households, more than half of all participants (52.52%) reply with "me", i.e., they themselves take care of energy-related decisions (**Table A.25**). This reply constitutes the largest share in all nine countries, varying from 60.27% in the United Kingdom to 42.40% in Slovenia. The second most frequent answer (28.07%) is that it is "typically a joint decision", followed by "another household member" with 11.74% and "it varies" with 4.47%. Although the option "person outside the household" makes up the smallest share across the entire sample with only 3.20%, Sweden stands out in this regard with 9.20% of the survey participants stressing that a person outside their household takes care of energy-related decisions in their household.

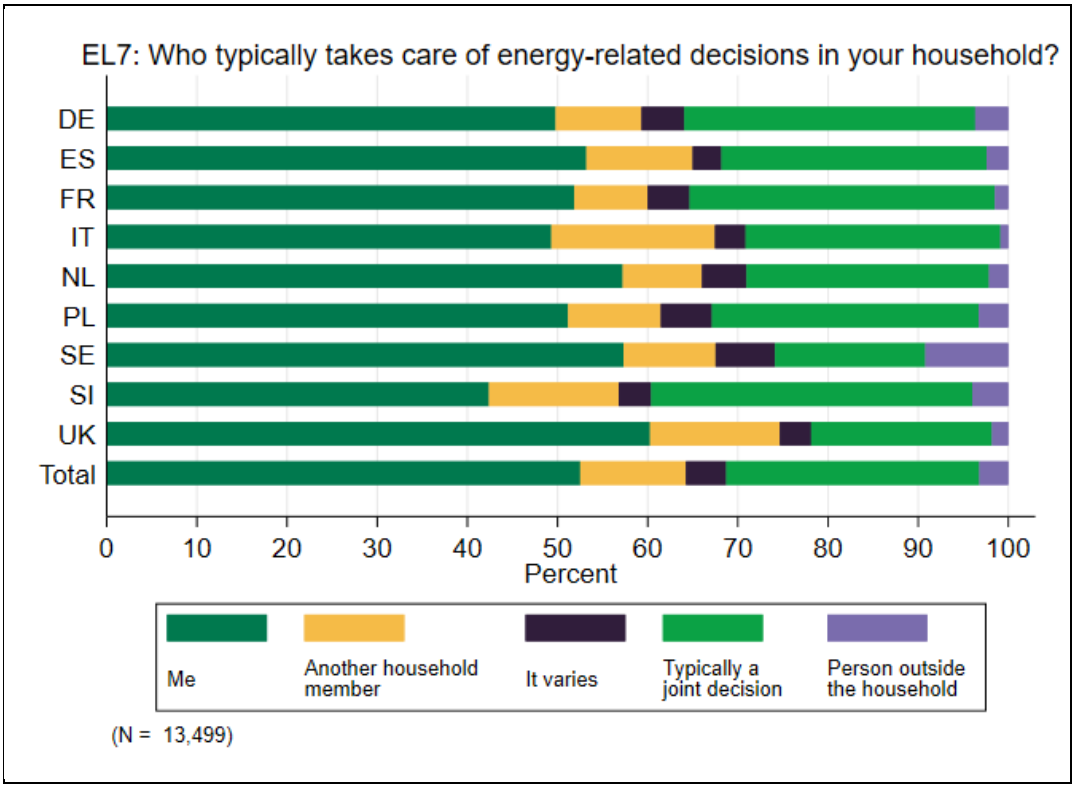

Figure 26: Person typically responsible for energy-related decisions in a household (EL7)

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In EL8, the survey participants are asked about the gender of the person who is typically responsible for energy-related decisions in a household, if it is typically just one person. This question is only asked, if the previous question (EL7) was answered with "another household member", therefore, for this question, the total sample size is N = 1,585.

Figure 27 shows that the participants in all nine countries more frequently say that male household members typically take care of energy-related decisions in the household. In total, 66.50% of the participants respond with "male", 31.61% respond with "female", 0.88% respond with "non-binary", and 1.01% do not disclose the gender (**Table A.26**). The share of "male" replies ranges from 79.02% in Germany to 57.14% in Poland.

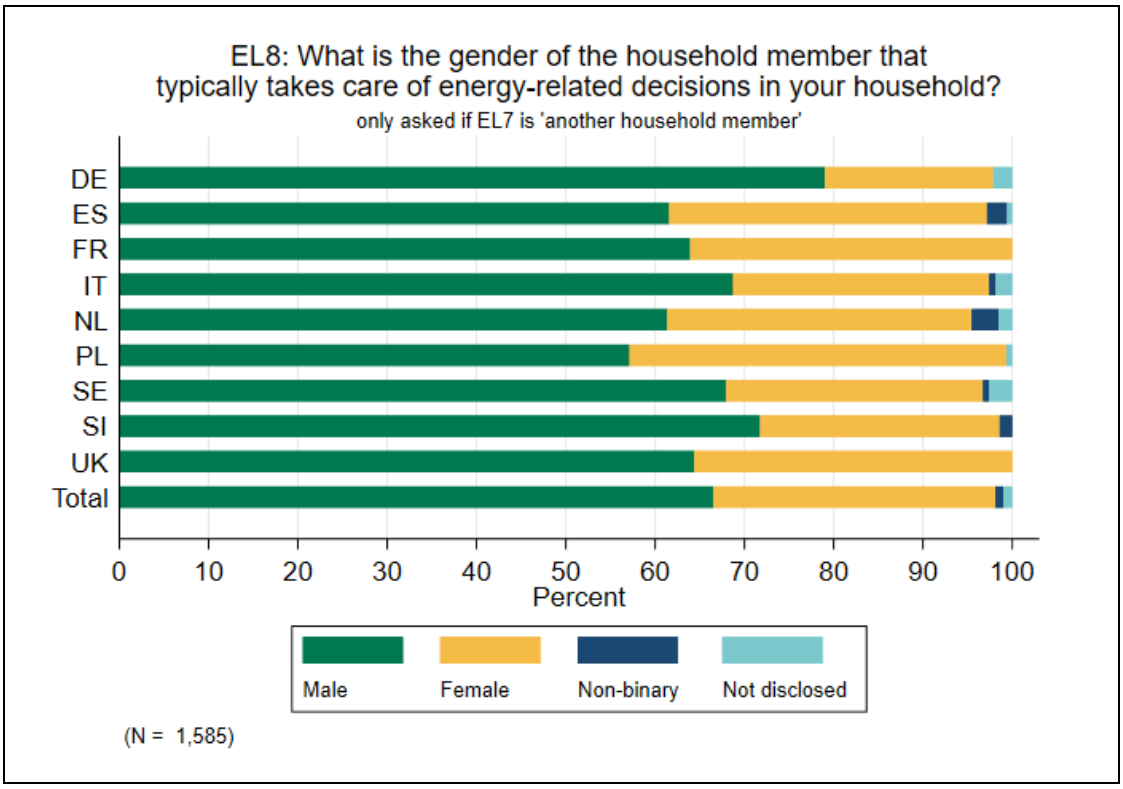

Figure 27: Gender of person typically responsible for energy-related decisions in a household, if it is typically just one person (EL8)

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In EL9, all the participants read the first part of the statement "In a typical household in my country, the person that mostly takes care of energy-related decisions is…". It is randomised, however, whether the statement ends with "male" or "female". 6,755 participants are confronted with the statement ending with "male", whereas 6,744 participants have the statement ending with "female".

As shown in **Figure 28**, in both cases, the response that the participants "neither agree nor disagree" with the statement makes up the largest share (32.04% for "male" and 38.76% for "female"). Similar to the share of "neither agree nor disagree", when the statement ends with "female", the share of participants saying that "more than one household member" takes care of energy-related decisions is higher (14.28%), as opposed to 9.55% saying the same when they see the statement ending with "male" (**Table A.27**).

When the statement ends with "male", the share of "agree" and "strongly agree" is higher (a total of 33.68%) compared to when the statement ends with "female" (a total of 16.46%). Likewise, when the statement ends with "female" there is a higher share of "disagree" and "strongly disagree" (a total of 30.50%) compared to when the statement ends with "male" (a total of 24.74%). These results are therefore also in line with the ones from the previous question (EL8).

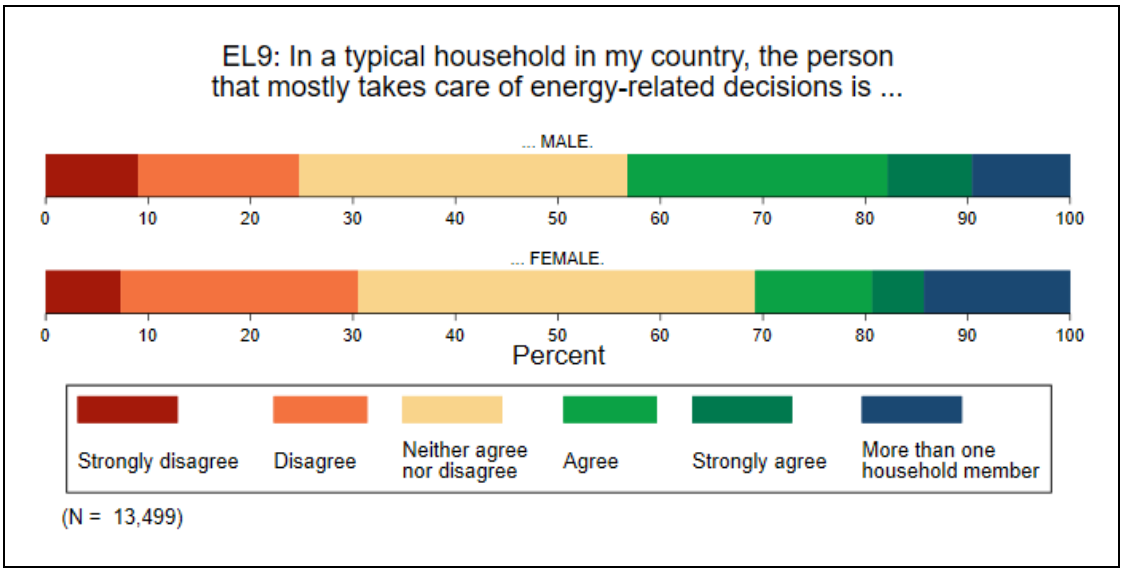

Figure 28: Gender of person typically responsible for energy-related decisions in a typical household (EL9)

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3.3 AW – Awareness of energy communities

During the survey, before seeing any energy community related questions, the concept of energy communities and three different variations of energy communities are introduced to the participants. For this purpose, two information screens are shown, which look as follows:

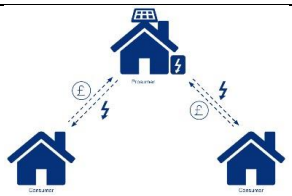
A special focus of this questionnaire is on energy communities.

- An **energy community** is a collaboration of various partners, for example **citizens, municipalities and companies**, promoting **energy efficiency** and/or (local) **renewable energy** generation.
- This can take the form of **jointly setting up a wind turbine** in the neighborhood, by jointly investing in **solar panels** on rooftops or by engaging in **electricity storage** or **local electricity trading**.
- Energy communities can range from local **citizen-led initiatives** to **virtual communities** or **municipal** or **commercially** driven initiatives.
- Often, they are also known as **energy cooperatives**.
- They often make use of new **energy generation** and **storage** technologies.
- And they **differ** in the way their **members are connected**, such as through regular **physical** member meetings or by communicating mainly through **digital** platforms.

Energy communities come in various forms.

Three examples are:

- A **local initiative** in which citizens **jointly** plan and **finance solar panels**, which serve to supply their **households with electricity**. The aim is to become **independent of large energy providers** and to contribute to the **greening of electricity**. Example (a)
- A so-called **virtual power plant**, where a **commercial energy provider connects customers** who own solar panels and sometimes also a home storage battery via a digital platform. The aim is to **redistribute the generated electricity** when the solar panels generate more electricity than the customers consume. The excess electricity is sold on the market to other energy users. Example (b)
- A community with **peer-to-peer electricity trading**, where **local households are virtually connected** to **trade electricity amongst each other**. Households with solar panels can sell the electricity they do not consume to other households without solar panels, often at a price that is lower than the usual local electricity tariffs. Example (c)

		
Example (a)	Example (b)	Example (c)

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Participants are then asked whether they have already encountered energy communities in the past. If they have, respondents are questioned about the circumstances in which this has happened, about the perceived importance of energy communities for advancing the use of sustainable energy, as well as whether they are members of an energy community.

Figure 29 shows that the majority of participants from all countries are unaware of energy communities, varying from 55.24% in the Netherlands to 79.13% in France (**Table A.28**). In total, the share of respondents who are not sure if they know any energy communities (15.09%) is similar to the share of participants who are aware of energy communities (16.00%). The highest awareness rate can be found in the Netherlands, where 29.29% of the participants are aware of energy communities.

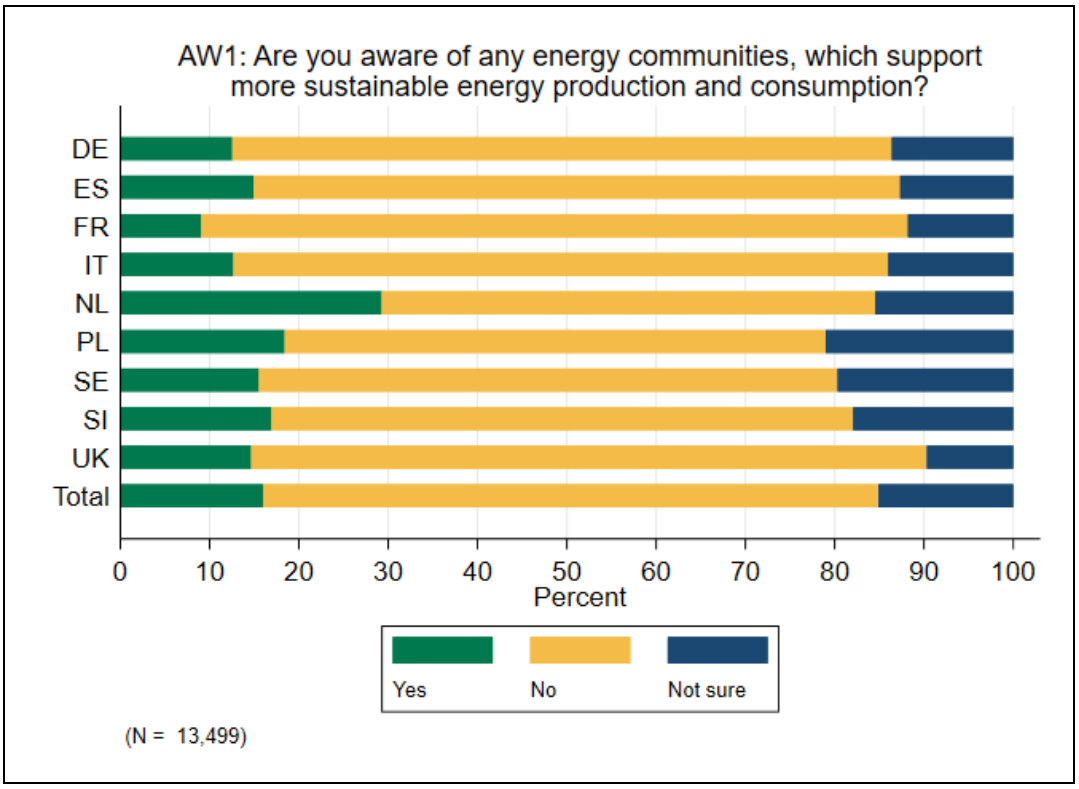

Figure 29: Awareness of energy communities (AW1)

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The 2,160 respondents (16.00%) who are aware of energy communities are then asked about how they became aware of these. As depicted in **Figure 30**, the most popular source of information is the Internet (40.09%). The media is also an important information source, with 33.47% of the respondents naming social media and 30.23% naming the local media as another source of information.

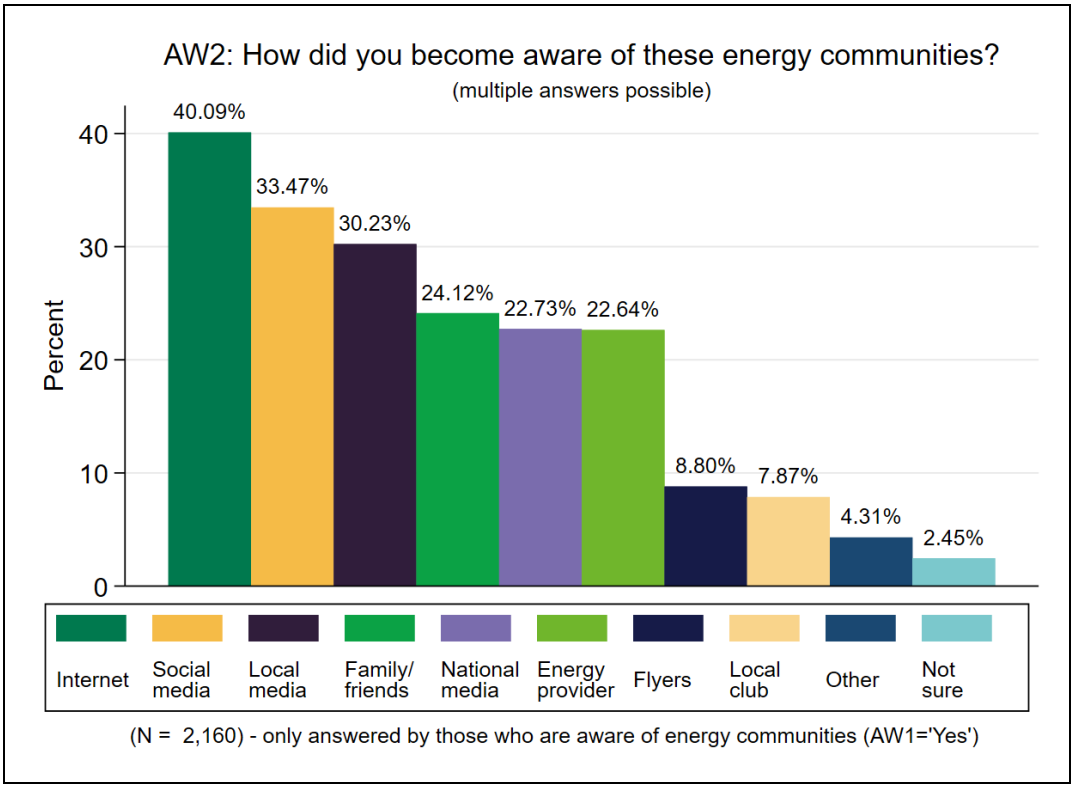

Figure 30: Source of awareness of energy communities (AW2)

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In a next step, those 2,160 respondents who are aware of energy communities are asked about the importance of energy communities for the transition towards a sustainable energy system (**Figure 31**). In all nine countries, 85.28% of the survey participants believe energy communities to be "important" or "very important" for this transition (**Table A.29**). The highest number of respondents, who value energy communities as an "important" or "very important" factor for a sustainable energy system, can be found in Italy (93.16%). With 58.42%, Italy also has the highest share of respondents who believe energy communities to be "very important" for a sustainable energy transition.

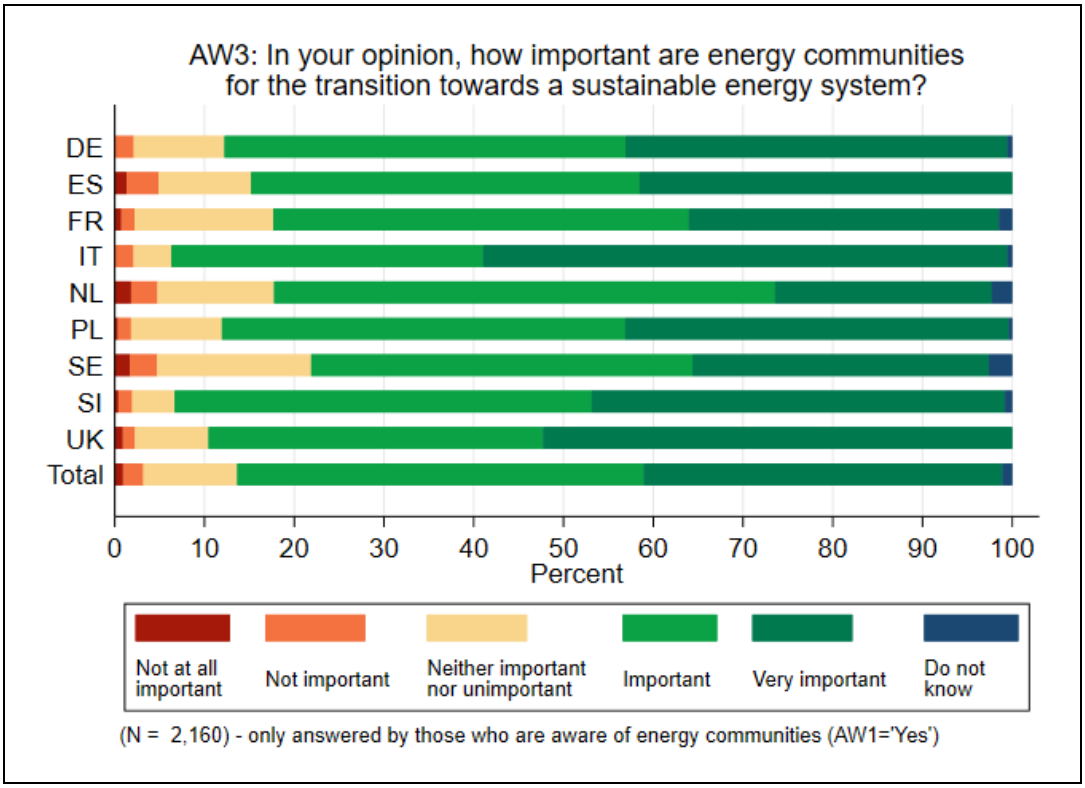

Figure 31: Perceived importance of energy communities for transition towards sustainable energy system (AW3)

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As shown in **Figure 32**, only a very limited part of all respondents (3.69%) is member of an energy community. Of those who are aware of energy communities, 23.06% of the respondents are members of such a community.

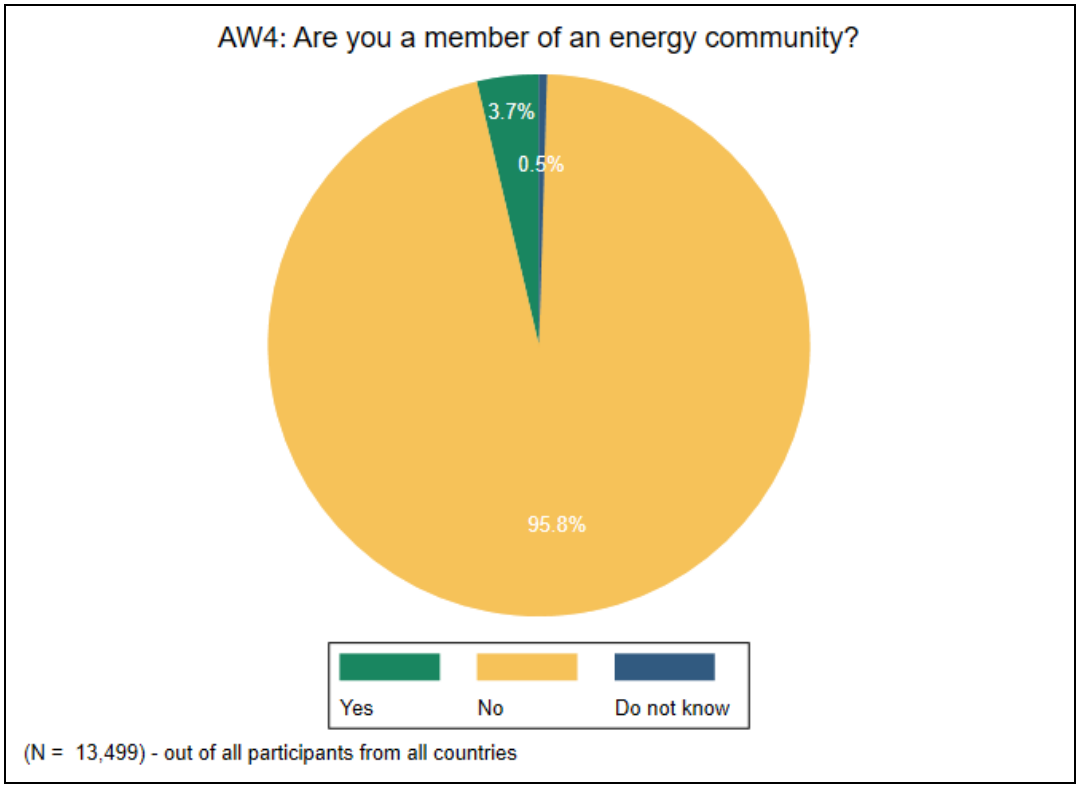

Figure 32: Energy Community members among all survey participants (AW4)

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Table 12 shows that energy community membership is not evenly distributed across countries. While e.g., in France, less than 1% (0.80%) of the respondents indicate membership, in the Netherlands 8.94% of the respondents are members of an energy community. These two countries represent the upper and lower bound of this distribution. Poland represents the second highest observation with a share of 4.60%, followed by Spain with a share of 4.47%. For the other countries, between 1.87% (Italy) and 4.00% (Sweden) of the participants are members of energy communities.

Table 12: Energy community members by country

Country	Member	Not a member
DE	30	1,470
	2.00%	98.00%
ES	67	1,433
	4.47%	95.53%
FR	12	1,488
	0.80%	99.20%
IT	28	1,472
	1.87%	98.13%
NL	134	1,365
	8.94%	91.06%
PL	69	1,431
	4.60%	95.40%
SE	60	1,440
	4.00%	96.00%
SI	41	1,459
	2.73%	97.27%
UK	57	1,443
	3.80%	96.20%
Total	**498**	**13,001**
	3.69%	**96.31%**

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Table 13 shows how members of energy communities classify themselves. Multiple answers are possible for this question. 30.52% indicate that they started the energy community and 56.02% consider themselves as an "active member". 18.27% of the community members among the survey participants see themselves as neither the initiator nor an active member of an energy community, which could be interpreted as a rather passive membership.

Table 13: Summary statistics (AW4a)

Variable	Mean	Std. dev.
AW4a_d1 (started community)	0.31	0.46
AW4a_d2 (active member)	0.56	0.50
AW4a_d3 (neither)	0.18	0.39
AW4a_d4 (do not know)	0.01	0.10

3.4 PB – Perceived benefits of energy communities

After all participants have been informed about the concept and general functioning of energy communities in the previous section, they are asked how important certain potential benefits are to them.

As shown in **Figure 33**, the reduction of household electricity costs (PB1a) is most frequently rated as a "very important" potential benefit by 49.53% of the respondents (**Table A.30**). The potential benefit of reducing fossil fuel consumption (PB1c) is "very important" to 41.17% and "quite important" to 39.97% of the respondents. 29.99% of the participants find the contribution energy communities can potentially make to the members' energy security (PB1h) "very important", whereas 49.29% still find it "quite important". Independence from large energy providers (PB1g) by being a member of an energy community is considered as a "very important" potential benefit by 29.71% and as a "quite important" potential benefit by 42.83% of respondents. The fact that energy communities can contribute to a fairer energy transition (PB1i) is considered "very important" by 28.47% and "quite important" by 48.66% of respondents. To be part of a movement addressing climate change (PB1e) is seen as a "very important" potential benefit by 26.14% and as "quite important" by 39.54% of participants. Engaging with new technologies (PB1f) is a potential benefit of energy communities that 23.04% of respondents find "very important" and 45.57% find "quite important".

The investment opportunity ("To invest and earn money" (PB1b)) and the social aspect ("To do things together with other community members" (PB1d)) are the potential benefits that are least frequently rated as "very important", with 19.51% and 16.81%, respectively. The social aspect is also the potential benefit that was most frequently rated as "not at all important" by the participants (11.19%).

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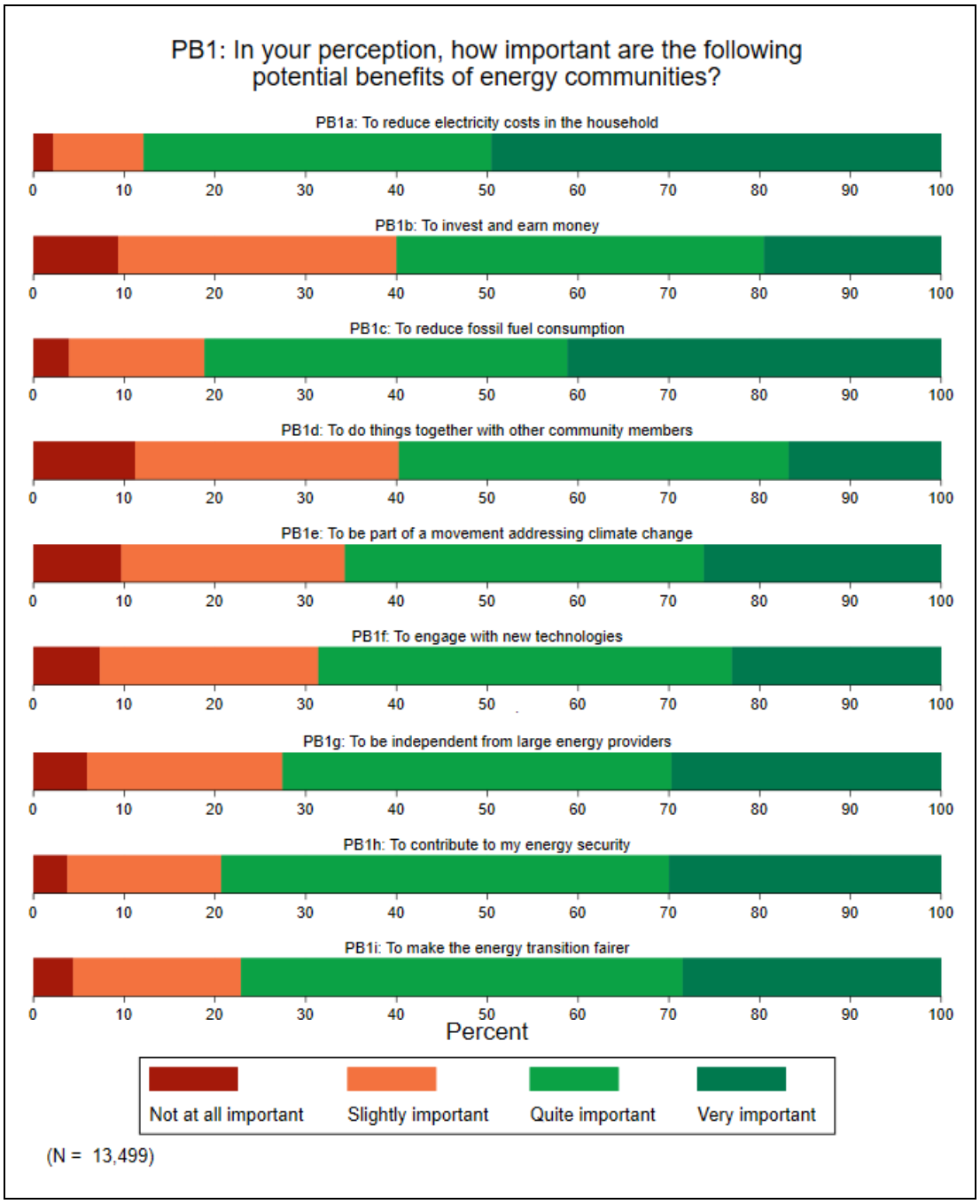

Figure 33: Perceived benefits of energy communities (PB1)

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By splitting the sample into energy community members and non-members[2], some differences in opinion among the two groups can be observed (**Table A.31-Table A.39**). When asked about the importance of the energy communities' benefit of reducing household electricity costs (PB1a) and fossil fuels consumption (PB1c), the distribution is similar among members and non-members. Opinions do differ when respondents are questioned about the importance of financial revenues (PB1b). Earning money is a benefit of energy communities that 36.35% of members find "very important", while 18.87% of non-members consider this benefit "very important". Social aspects seem to be more important to respondents who are a member of an energy community than to respondents who are non-members. 38.76% of members and 15.97% of non-members consider the benefit of doing things together with other community members (PB1d) "very important". Being part of a movement addressing climate change (PB1e) is a benefit considered "very important" by 41.97% of energy community members and 25.53% of non-members. 81.33% of energy community members believe the engagement with new technologies (PB1f) to be a "quite important" (39.76%) or "very important" (41.57%) benefit of energy communities. 68.12% of non-members consider this benefit "quite important" or "very important", with 45.79% and 22.33%, respectively. To be independent from large energy providers (PB1g) is considered a "very important" benefit by 38.55% of members and by 29.37% of non-members. The contribution to the participant's energy security (PB1h) is a benefit of energy communities that 49.66% of non-members consider "quite important" and 29.45% of non-members consider "very important", compared to 39.56% of members who consider this benefit "quite important" and 44.18% of members who consider it "very important". Finally, respondents are asked how important they consider the energy communities' benefit of making the energy transition fairer (PB1i). 49.05% of non-members consider this benefit "quite important" and 27.89% "very important". In comparison, 38.35% of members believe this to be a "quite important" and 43.57% of members a "very important" benefit of energy communities.

[2] Participants who indicated that they did not know whether or not they are members of an energy community are treated as non-members over the course of this report.

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3.5 DB – Drivers and barriers for diffusion of energy communities

As the section about awareness of energy communities has shown, they are not yet very well-known and only few people state to be a member of an energy community. To understand further what factors can motivate people to join energy communities as well as to elaborate which factors might hold them back from doing so, the following section focuses on the drivers and barriers that shape the diffusion of energy communities. For instance, the questions try to find out whether most people have not joined an energy community because they are not yet aware of a potential energy community or whether, for example, financial and social factors play a decisive role. The results from this section are of central importance for learning how to foster the growth of energy communities across Europe.

As **Figure 34** illustrates, DB6 to DB8 specifically address the participants' involvement with energy communities. The options shown in DB6-8 depend on the previous answers of the participants, which results in different sample sizes. If the participants previously replied to S7 ("Do you have a green electricity tariff?") with "Yes", they are not shown option 1 ("switching to a green energy tariff") in DB6-8. If they replied to AW4 ("Are you a member of an energy community?") with "Yes", they are not shown option 2 ("joining an energy community") and option 3 ("starting or getting actively involved in an initiative to create an energy community") in DB6-8. For the participants, who responded to both S7 and AW4 with "Yes", DB6-8 is omitted.

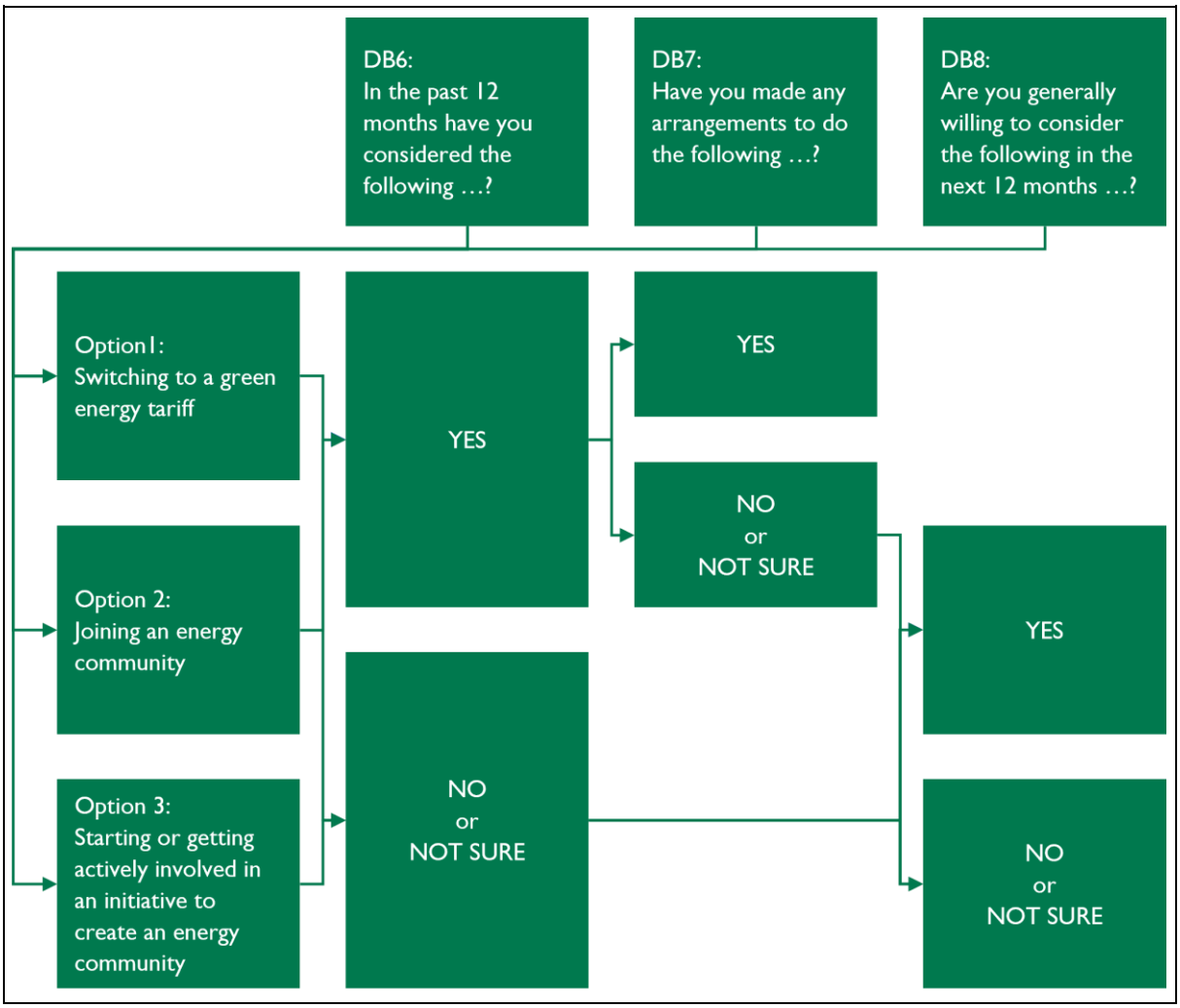

Figure 34: Involvement with energy communities (DB6-DB8) – decision hierarchy

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As can be seen in **Table 14**, in response to the question "In the past 12 months have you considered the following …?" (DB6), almost one third of the participating sample report that they have considered "switching to a green energy tariff" (29.33%). Meanwhile, 10.25% of the participants say that they have considered "joining an energy community" and 9.18% considered "starting or getting actively involved in an initiative to create an energy community".

If the participants reply to DB6 with "Yes", they are shown the respective options in DB7. Likewise, if they reply to all options in DB6 with "No" or "Not sure", they skip DB7 and move to DB8. DB7 asks: "Have you made any arrangements to do the following in the next 12 months …?". Here, the share of participants who reply with "Yes" is higher for all options. 43.67% of the respondents say they have made arrangements to switch to a green energy tariff, 41.29% of the participants share that they have made arrangements to join an energy community and almost half of the sample (46.35%) state that they have made arrangements to start or get actively involved in an initiative to create an energy community.

Finally, DB8 asks "Are you generally willing to consider the following in the next 12 months …?" 40.40% of the participants are generally willing to consider switching to a green energy tariff, 27.15% are generally willing to consider joining an energy community and 18.85% are generally willing to consider starting or getting actively involved in an initiative to create an energy community.

Table 14: Involvement with energy communities (DB6-DB8) in %

Option	Answer	DB6	DB7	DB8
1 "switching to a green tariff"	Yes	29.33%	43.67%	40.40%
	No/not sure	70.67%	56.33%	59.60%
	Sample size	10,362	3,039	9,035
2 "Joining an energy com-munity"	Yes	10.25%	41.29%	27.15%
	No/not sure	89.75%	58.71%	72.85%
	Sample size	13,001	1,332	12,451
3 "Starting or getting involved"	Yes	9.18%	46.35%	18.85%
	No/not sure	90.82%	53.65%	81.15%
	Sample size	13,001	1,193	12,448

In DB1, the participants are asked about what is holding them back from joining an energy community. This question is only answered by those who are not a member of an energy community, resulting in a sample size of 13,001. Giving multiple answers for this question is possible.

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As shown in **Figure 35**, the largest share of participants (54.87%) report that they are or were "not aware of energy communities" as a reason for not joining an energy community. In all countries, except for the Netherlands, more than half of the participants say that the unawareness is holding them back, whereas in the Netherlands only 32.89% of the participants describe this as a reason. Not being aware of the energy communities is followed by a "lack of skills and/or knowledge" (34.28%) and 32.44% of the participating sample reply that they "lack the financial resources", which is holding them back from joining an energy community. Slovenia has the largest share of participants who cite a lack of financial resources as a reason for not joining an energy community with 41.81%. A "lack of time" was a reason for 19.13% of the participants to not join an energy community. Being "satisfied with the current energy system" was a reason for 12.83% to not join an energy community, however, there are some notable country differences with 6.52% of the respondents from Italy and 27.40% of the participants from the Netherlands submitting this as a reason.

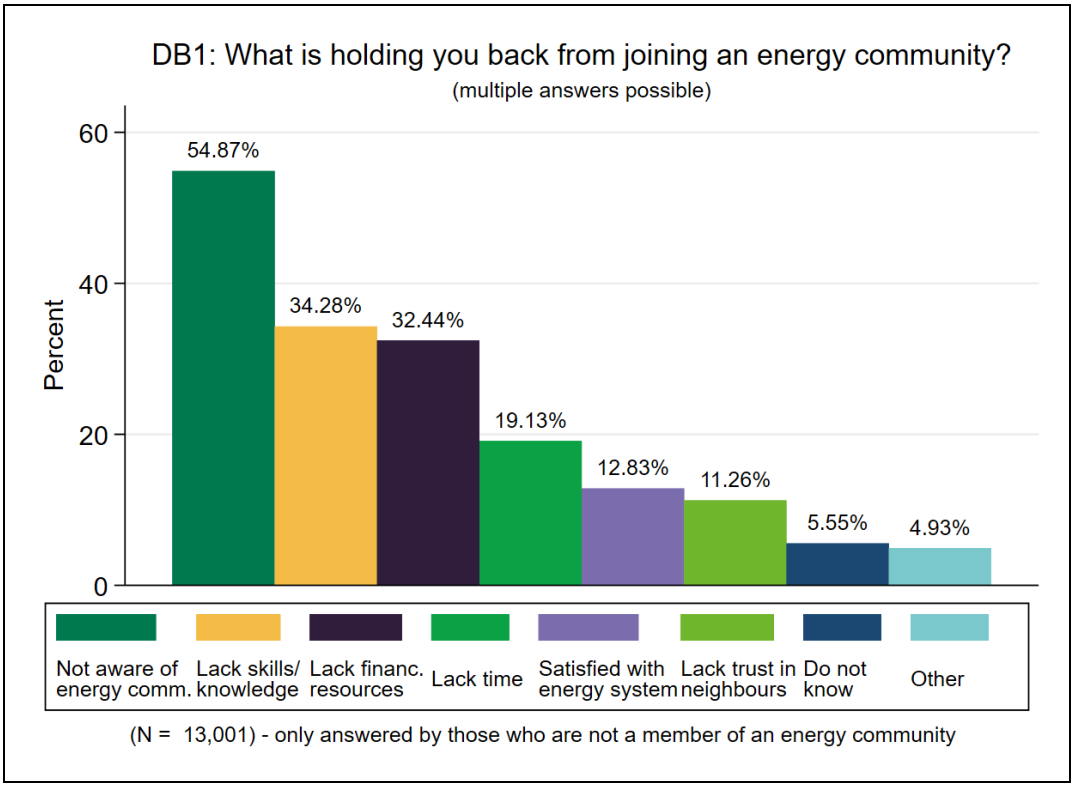

Figure 35: Reasons for not joining an energy community so far (DB1)

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As opposed to DB1, which is concerned with the reasons for not joining an existing energy community, DB2 asks for the reasons for not starting or not getting actively involved in an initiative to create an energy community so far. Again, this question is only answered by those who are not a member of an energy community. The participants are shown the same options to choose from which they were already presented in DB1, with the exception of "not aware of energy community" being removed. The descending order of the first reasons is the same compared to the previous question.

Figure 36 shows that 49.66% name a "lack of skills and/or knowledge" as a reason for not starting or not getting actively involved in an initiative to create an energy community. Therefore, the share increases by more than 15 percentage points compared to those previously describing it as a reason for not joining an energy community (34.28%). Similarly, the same can be said about the "lack of financial resources", where the share increases from 32.44% to 37.73% and about the "lack of time" with an increase from 19.13% to 28.12%. The fact that more participants are mentioning these reasons could imply that they perceive starting or getting actively involved in an initiative to create an energy community as more knowledge-intensive, costly, and time-consuming compared to joining an existing energy community. It is, however, also possible that the set of possible answer options affect the distribution of replies.

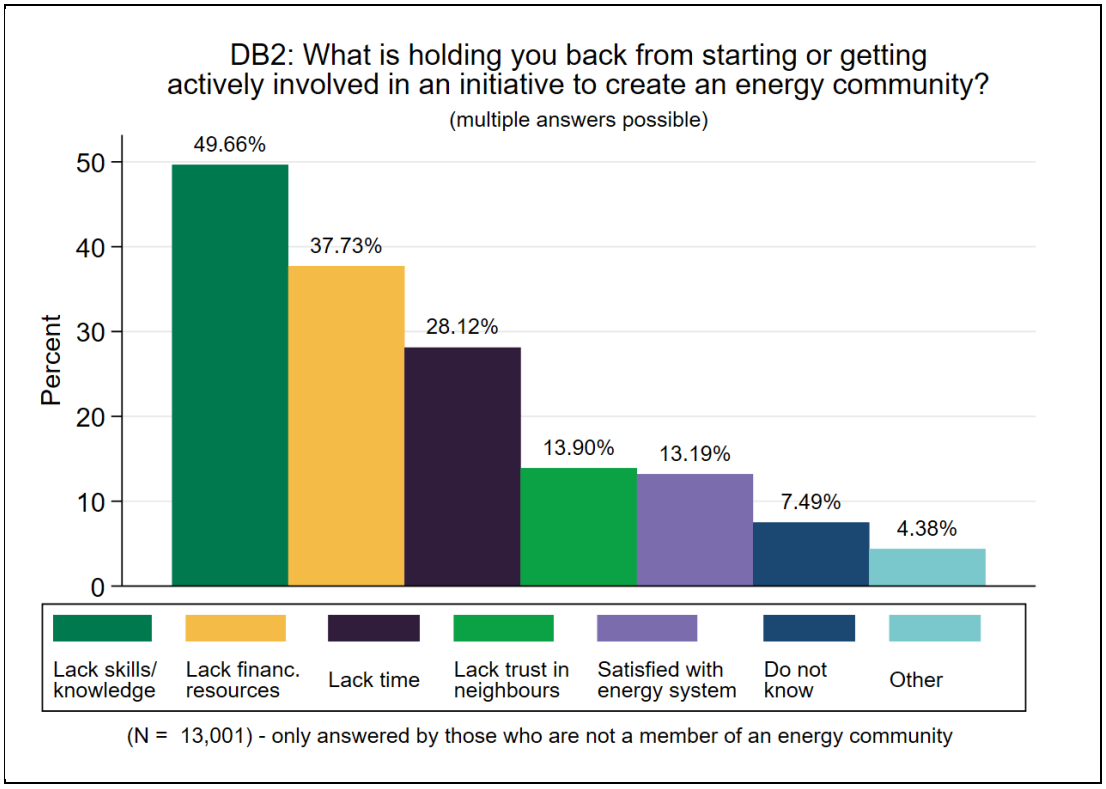

Figure 36: Reasons for not starting or not getting actively involved in an initiative to create an energy community so far (DB2)

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DB4 assesses how much the participants agree or disagree with the statement "The benefits of being part of an energy community are clear to me". **Figure 37** reveals that the largest share of the respondents (43.31%) "neither agree nor disagree" with the statement, indicating that they are not entirely sure about the benefits of being part of an energy community (**Table A.40**). A total of 32.37% either "agree" or "strongly agree" and a total of 24.32% either "disagree" or "strongly disagree" with the statement. When comparing the countries, there are some notable differences; the benefits of being part of an energy community seem to be most clear to the participants from Poland with 43.40% who either "agree" or "strongly agree" and only 10.20% who either "disagree" or "strongly disagree". On the other hand, the benefits seem to be least clear to the participants from Slovenia with 49.47% of the respondents who either "disagree" or "strongly disagree" and only 15.47% either "agree" or "strongly agree". Meanwhile, it seems that the respondents in Sweden are the most indifferent with 54.07% who "neither agree nor disagree" with the statement.

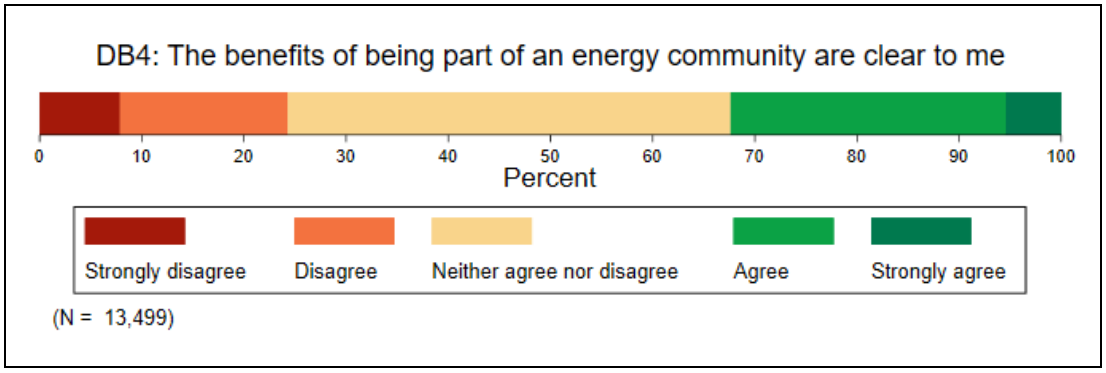

Figure 37: Clarity/understanding of benefits of an energy community (DB4)

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DB5 presents three statements regarding the participants' perception of energy communities and asks how much they agree or disagree with them. As depicted in **Figure 38**, 49.88% of all participants either "agree" or "strongly agree" with the statement DB5a "Having technical knowledge is a key condition to be a member of an energy community" (**Table A.41**). This is in line with the results from DB1 and DB2 in which participants stress a lack of skills and/or knowledge as a key reason for not joining or starting an energy community. However, a notable proportion of the participants (9.46%) also replies with "do not know". DB5b shows that the vast majority of the respondents (79.20%) either "agree" or "strongly agree" that "trust is a crucial factor in a community initiative", while only a combined 2.56% either "disagree" or "strongly disagree". Similarly, 60.29% of the participants either "agree" or "strongly agree" with the statement that "It is essential that members of an energy community are likeminded (for example, with respect to environmental, political and cultural topics)" (DB5c).

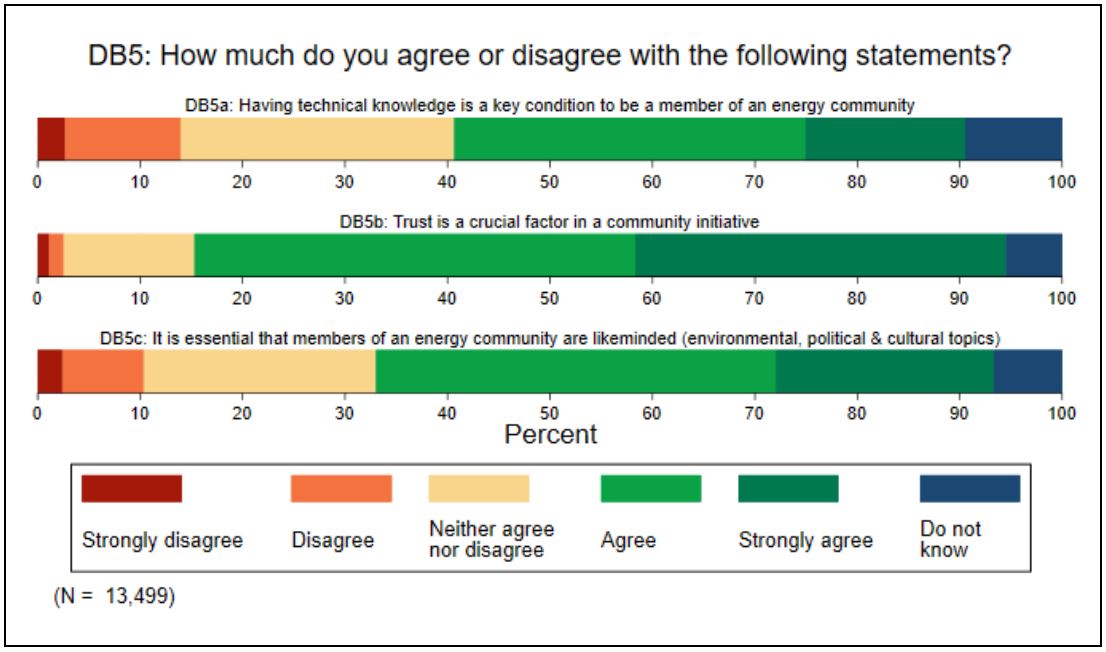

Figure 38: Perception of energy communities (DB5)

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DB6a deals with three of the main motivations of partaking in an energy community. Firstly, as it is shown in **Figure 39**, 71.61% of the participants either "agree" or "strongly agree" that "the economic benefit" (DB6a_1) is the main motivation to be part of an energy community (**Table A.42**). These results are in line with the results of the answers to question PB1 "In your perception, how important are the following potential benefits of energy communities?" In response to the question, 87.85% of the respondents perceive the reduction of electricity costs in the household (PB1a) as either "quite important" or "very important", and a total of 59.97% have the same opinion about the benefit of investing and earning money (PB1b).

"The social aspect" (DB6a_2) as a main motivation to be part of an energy community receives the lowest agreement rate of the three presented options of DB6a, yet still 48.23% either "agree" or "strongly agree" with it. These findings are also in line with those of PB1, where the social aspect of doing things together with other community members (PB1d) is the potential benefit that was least frequently rated as either "quite important" or "very important" with still 59.75%.

Finally, "the environmental benefit" (DB6a_3) receives the highest agreement rate among the options presented in DB6a with 77.62% of the participating sample who either "agree" or "strongly agree" that it is the main motivation to be part of an energy community. Again, these results are in line with those of PB1, since the potential benefit of reducing fossil fuel consumption (PB1c) is either "quite important" or "very important" to a total of 81.14% of the participants.

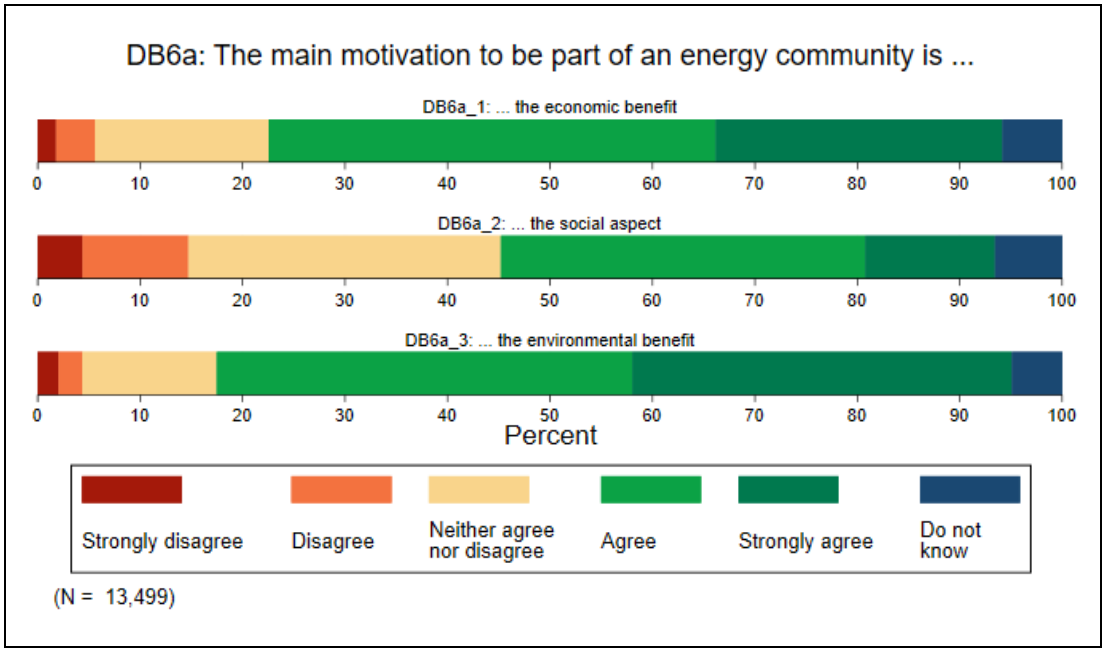

Figure 39: Main motivation of partaking in an energy community (DB6a)

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By splitting the sample into members of energy communities and non-members, differences in opinions on the three main motivations among the groups can be assessed (**Table A.43**-**Table A.45**). As expected, the rate of respondents who indicate "I do not know" is generally lower among members than among non-members. 40.36% of energy community members "strongly agree" that "the economic benefit" (DB6a_1) is the main motivation to be part of an energy community. In comparison, 27.51% of non-members "strongly agree" with this statement. "The social aspect" (DB6a_2) is the motivation that causes the most variation between members and non-members of energy communities. 33.73% of energy community members "strongly agree" that "the social aspect" is the main motivation to be part of an energy community, whereas 11.88% of non-members "strongly agree" with this statement. While "the environmental benefit" (DB6a_3) receives the highest agreement rate both among members of energy communities and non-members, with 82.93% and 77.42%, respectively, the distribution between "agree" and "strongly agree" differs between the two groups. 32.33% of members "agree" and 50.60% of members "strongly agree" with this statement that the environmental benefit is the main motivation for being part of an energy community, whereas 40.87% of non-members "agree" and 36.54% of non-members "strongly agree" with the statement.

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3.6 EC – Experiment 1: attractiveness of energy communities

The aim of the discrete choice experiment was to deepen our understanding of which features European citizens value the most in energy communities. We therefore randomly selected 50.00% of the survey respondents in each country to participate in the choice experiment. In the experiment, we presented four choice cards with two different energy community options to the respondents and asked them to select from each choice card the community that they would prefer to join, or to select the option to not join any of the two energy communities.

Results on participants' preferences for the six energy community attributes

In **Table 15** below, we provide the number of participants and observations per country, as well as the share of participants who always selected the option to not join any of the energy communities, which could be interpreted as a general reluctance to join an energy community (but could also be attributed to cultural differences regarding the tendency to accept or reject an option to join a community). This share is highest in the Netherlands (23.80%) and lowest in Poland (8.02%), and on average, across the entire sample, lies at 15.10%. The countries with above average shares of respondents that rejected all community options are – besides the Netherlands – Sweden, France, and Germany. The countries with below average shares are – besides Poland – Slovenia, Spain, Italy, and the UK. This indicates that Dutch, Swedish, French, and German participants were relatively more reluctant to choose one of the energy community options shown in the choice experiment, while Polish, Slovenian, Spanish, Italian and British participants were relatively more prone to selecting one of the provided community options.

In the following, we report the coefficients of the choice experiment attributes for the entire sample, and also for each country. The analysis is based on a conditional logit model run in STATA, accounting for the six choice attributes and the alternative-specific constants. For each choice attribute we selected a baseline level and report the coefficients of the respective other attribute levels. Positive (negative) coefficients thereby indicate that the respective attribute level contributes positively (negatively) to the respondents' utility from energy community membership.

The parameter estimates for the **entire sample** suggest that participants strongly value the financial benefits emanating from energy community membership, as well as the possibility to be involved in the decision-making within the community. Both the possibility for indirect involvement and the possibility for strong involvement show comparatively high parameter estimates, which are both significant at the 1% level. Regarding, the type of community (local vs. virtual, direct contact among members vs. no contact) participants seem to strictly dislike anonymous communities with no contact among community members, while no significant distinction is made between local and virtual communities as long as they involve personal contact among community members. Regarding the entity that manages the community (citizens vs. housing associations vs. utilities vs. municipalities) it seems that participants, on average, dislike if the management is in the hand of a housing association, while no further distinction can be made between citizen-managed communities and communities managed by a municipality and an energy utility. If the energy community involves an optional or obligatory investment, participants seem less inclined to join the community, which can be derived from the negative and highly significant coefficients of the investment attribute levels. Regarding extra services provided to community members, participants seem to prefer particularly the option to trade electricity among community members, while car sharing, on average, is least preferred.

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Table 15: Estimates of the choice attributes coefficients based on a conditional logit model

	DE	ES	FR	IT	NL	PL	SE	SI	UK	Total
Number of participants	766	747	751	742	748	748	749	738	733	6,722
Number of observed choices	3,064	2,988	3,004	2,968	2,992	2,992	2,996	2,952	2,932	26,888
Share of participants rejecting all community options	16,19%	12,45%	20.11%	12.53%	23,80%	8.02%	21,76%	11,79%	14.60%	15.71%
Alternative-specific constants (Baseline: Alternative 1)										
Alternative 2	-0.20*** (0.04)	-0.24*** (0.04)	-0.09* (0.05)	-0.03 (0.04)	-0.11*** (0.04)	-0.18*** (0.04)	-0.17*** (0.05)	-0,10 ** (0.05)	-0.19*** (0.05)	-0.15*** (0.01)
Alternative 3 (no community)	-0.12 (0.17)	-0.31* (0.18)	0.29* (0.17)	-0.25 (0.18)	0.15 (0.17)	-0.85*** (0.21)	0.30* (0.18)	-0.20 (0.19)	-0.14 (0.19)	-0.10* (0.06)
Community type (Baseline: Local)										
Virtual without contact	0.14 (0.23)	0.01 (0.24)	-0.32 (0.25)	-0.31 (0.25)	-0.20 (0.22)	-0.45* (0.27)	-0.01 (0.22)	-0.06 (0.26)	-0.40* (0.24)	-0.17** (0.08)
Virtual with contact	0.02 (0.16)	0.03 (0.16)	-0.26 (0.16)	-0.06 (0.17)	-0.03 (0.15)	-0.26 (0.19)	-0.14 (0.16)	0.13 (0.17)	-0.19 (0.17)	-0.07 (0.05)
Investment requirement (Baseline: No investment)										
Optional investment	-0.05 (0.12)	-0.24* (0.12)	-0.48*** (0.13)	-0.34*** (0.12)	-0.25** (0.12)	-0.18 (0.12)	-0.01 (0.12)	-0.39*** (0.12)	-0.09 (0.12)	-0.22*** (0.04)
Required investment	-0.16 (0.11)	-0.02 (0.12)	-0.24** (0.11)	-0.19 (0.12)	-0.21** (0.10)	-0.09 (0.13)	-0.09 (0.11)	-0.09 (0.12)	-0.10 (0.12)	-0.13*** (0.04)
Community services (Baseline: Bulk buying of appliances)										
Electricity trading	-0.29*** (0.11)	-0.06 (0.13)	0.25* (0.14)	0.17 (0.13)	0.10 (0.11)	0.11 (0.13)	0.21* (0.12)	0.03 (0.14)	0.24** (0.12)	0.08* (0.04)
Carsharing	-0.05 (0.09)	-0.32*** (0.10)	-0.23** (0.09)	-0.32*** (0.10)	-0.03 (0.08)	-0.08 (0.11)	0.20** (0.09)	-0.36*** (0.10)	0.03 (0.09)	-0.12*** (0.03)
Involvement in decision-making (Baseline: No involvement)										
Indirect involvement	-0.21 (0.25)	0.40 (0.26)	0.73** (0.30)	0.60** (0.26)	0.23 (0.24)	0.34 (0.27)	-0.01 (0.26)	0.54** (0.28)	0.32 (0.26)	0.33*** (0.09)
Strong involvement	0.56*** (0.07)	0.53*** (0.07)	0.80*** (0.08)	0.57*** (0.07)	0.45*** (0.08)	0.57*** (0.07)	0.57*** (0.08)	0.55*** (0.07)	0.60*** (0.07)	0.58*** (0.02)
Entity managing the community (Baseline: Citizens)										
Housing association	-0.22** (0.11)	0.11 (0.11)	-0.00 (0.11)	0.04 (0.12)	-0.19* (0.11)	-0.29** (0.13)	-0.18 (.011)	0.18 (0.11)	-0.38*** (0.12)	-0.10*** (0.04)
Municipality	omitted	omitted	omitted	omitted	omitted	omitted	omitted	omitted	omitted	omitted
Energy utility	0.30 (0.23)	0.11 (0.24)	-0.05 (0.24)	0.07 (0.25)	-0.03 (0.22)	-0.20 (0.26)	0.08 (0.22)	0.33 (0.26)	-0.04 (0.24)	0.07 (0.08)
Percentage change in monthly bill										
	-0.06*** (0.01)	-0.06*** (0.01)	-0.08*** (0.01)	-0.05*** (0.01)	-0.05*** (0.01)	-0.07*** (0.01)	-0.07 *** (0.01)	-0.06*** (0.01)	-0.07*** (0.01)	-0.06*** (0.00)
Log Pseudolikelihood	-3,176	-3,003	-3,037	-3,001	-3,155	-2,862	-3,095	-2,907	-2,932	-27,475

Robust standard errors in parentheses; Significance levels: * = 10%, ** = 5%, and *** = 1%.

When considering the **results for the 9 different countries**, we observe some heterogeneity in preferences but also some very similar results. In particular, the strong preference of **financial benefits** is a consistent result across countries. All coefficients of the change in the monthly bill are strictly negative and significant at the 1% level. This means that all participants value savings on their monthly bill and dislike extra costs. Another consistent result is the strong preference for **involvement in the energy community**: the coefficient of "strong involvement" is strictly positive

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and also significant at the 1% level across all countries, which suggests that participants from all countries value very highly to participate in decision-making if they decide to join an energy community. Regarding the **option to invest** or even a **required investment**, participants across all countries express objections, albeit to a varying degree. The coefficients of the two levels of investments are all negative, but only statistically significant in the cases of the Netherlands, France, Spain, Italy and Slovenia.

Generally, participants do not express strong preferences regarding the **type of community**. Exceptions are the UK and Poland, where the dislike of virtual communities without contact among members is significant at the 10% level. Participants from these two countries seem to drive the negative influence of virtual communities without contact that we observe on average, for the full sample. Regarding the **entity that manages the energy community**, participants from most countries express dislike of management by a housing association, to a certain extent, yet this does not always entail a statistically significant coefficient. The negative coefficients for management by a housing association are statistically significant only in the German, Dutch, UK and Polish samples. No further differences in preferences can be observed for the other possible management entities.

The strongest heterogeneity across countries can be found in the extra **services to community members**: while German participants strongly reject the option to participate in electricity trading, participants from Sweden, the UK and France seem to welcome the opportunity. Also, while participants from France, Spain and Italy express dislike of the carsharing option, participants in Sweden express positive value for this service.

Lastly, while we observe a general **tendency against joining one of the presented communities** in Sweden and France, we see a tendency to select one of the community options in Poland and Spain (see the coefficient of alternative-specific constant of Alternative 3, which was the option to not join any of the presented communities).

Results on the stated importance of the energy community attributes

After having made their selection in the four choice cards, participants were asked to rate the importance of the six community attributes presented in the choice cards on a 5-point scale from 1 (not at all important) to 5 (very important). With this score they were supposed to indicate how important the different energy community characteristics were for their decisions in the choice experiment.

The results presented in **Table 16** below are largely consistent with the parameter estimates in the choice experiment and demonstrate that the **financial consequences of energy community membership** – in the form of monthly extra payments or savings on the energy bill – were rated as the single most important decision criterion by participants across all nine countries, whereas the **type of community** seemed to matter least across all countries, as it was consistently rated the lowest. One exception is Poland where community management scored slightly lower as the type of community. Also, for the other attributes the ranking appears relatively consistent across countries. The second (in DE, ES, and SI the third) most important attribute after the financial attribute was the **involvement in decision-making**, which was rated very highly across countries. This is followed by the **required investment**, which often ranked third, except for Germany and Slovenia, where it was ranked more important, while in Sweden, Poland, France, and Spain it was ranked less important than on the country average. Especially in Sweden and France the role of the required investment seemed to have only relatively little influence on the choices. The **provided services to the community** were ranked fourth, on average. This feature scored above average in Poland, but below average in the Netherlands and Spain. Finally, we see some variation in the rating of the importance of the **type of community management**. On average, it was ranked fifth, but particular importance was put on

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this feature in Spain, France, and Sweden where it ranked second (ES) or third (SE, FR). In Poland, however, it was ranked least, or at least similarly low as the type of community.

Table 16: Average scores for choice attribute importance

	DE	ES	FR	IT	NL	PL	SE	SI	UK	Total
Number of participants	766	747	751	742	748	748	749	738	733	6,722
Average scores for attribute importance (based on scale from 1 to 5)										
Type of community	3.42 (6.)	3.62 (6.)	3.41 (6.)	3.62 (6.)	3.29 (6.)	**3.66 (5.)**	3.19 (6.)	3.54 (6.)	3.44 (6.)	3.46 (6.)
Investment requirement	**3,69 (2.)**	**3.86 (4.)**	**3.48 (5.)**	3.80 (3.)	3.51 (3.)	**3.78 (4.)**	**3.24 (5.)**	**3.86 (2.)**	3.68 (3.)	3.66 (3.)
Services to community members	3,63 (4.)	**3.73 (5.)**	3.50 (4.)	3.79 (4.)	**3.34 (5.)**	**3.81 (3.)**	3.25 (4.)	3.80 (4.)	3.63 (4.)	3.61 (4.)
Involvement in decision-making	**3.63 (3.)**	**3.87 (3.)**	3.72 (2.)	3.89 (2.)	3.53 (2.)	3.86 (2.)	3.46 (2.)	**3.83 (3.)**	3.71 (2.)	3.72 (2.)
Community management	3.49 (5.)	**3.88 (2.)**	**3.51 (3.)**	3.75 (5.)	**3.46 (4.)**	**3.66 (6.)**	**3.30 (3.)**	3.71 (5.)	3.61 (5.)	3.60 (5.)
Change in monthly bill	3.91 (1.)	4.06 (1.)	3.99 (1.)	4.08 (1.)	3.73 (1.)	4.20 (1.)	3.75 (1.)	4.14 (1.)	3.97 (1.)	3.98 (1.)

Attribute ranking in parentheses, from 1 = ranked highest to 6 = ranked lowest;
deviations from average rank indicated in bold font.

These results on the stated importance of the choice attributes largely reflect the insights derived from the choice experiment which further validates the results.

Conclusions from the analysis of the choice experiment

From this analysis of the choice experiment data, we can conclude that most European citizens will be more inclined to join an energy community if this entails a financial benefit for them and if they get a chance to participate in the decision-making of the community. These two factors show the strongest effect in the analysis of the choice experiment and are also reflected in the answers to the question about the stated importance of the choice attributes.

The type of community does not seem to play a major role for most citizens, although participants in Poland and the UK expressed dislike for virtual communities without contact among members. Similarly, community management seems to play less of a role, with some tendency to reject a community if it is run by a housing association, which we could observe in particular in Germany, the Netherlands, the UK and Poland.

What seems to be an important decision criterion for most participants is the fact whether community membership requires an investment in clean energy capacity. Thereby, most participants seem to avoid communities where an investment in required, although the negative coefficients are significant only for the Netherlands, France, Spain, Italy and Slovenia – and also more often for the optional investment, compared to the required investment. This might reflect some kind of social dilemma concern in the case of optional, rather than required investments.

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A further promotion of energy communities within Europe might therefore be most successful for energy community business models that allow community members to gain financially while having a strong say in the community decisions. In Sweden, citizens might also get attracted if communities offer services like car sharing or electricity trading. For electricity trading this holds also for the UK and France.

3.7 DR – Experiment 2: demand response

One of the most central challenges in the transition to renewable energy is that energy supply is more volatile and insecure. While fossil fuel or nuclear power plants can be controlled and regulated, renewable energies depend on natural forces such as wind and sunshine. To solve this problem, the policymakers' focus rests just as much on finding solutions to store and transport large amounts of energy as it rests on expanding the production capacity of renewables. One further solution that could help to better match the supply and demand of energy are so-called "demand response" mechanisms. The idea behind these is that incentives are created to consume more energy when production is high (strong sun and/or strong wind) and to consume less energy when production is low (less sun and/or little wind). There are different ways to communicate this information to the consumer, such as sending notifications or signalling the current market price per kilowatt-hour. This section evaluates consumers' attitudes towards two variations of a demand response scheme and explores how it would work in combination with energy communities.

Since some energy providers offer a pricing model, which divides the day into different pricing periods, in DR1, the participants are asked whether they have a variable energy pricing tariff, where the electricity price depends on the time of day. This questions as well as the whole "Demand Response" experiment is shown to only half of the participants, i.e., approximately 750 participants from each country. The other half of the participants did instead participate in the choice experiment on energy communities.

As it is depicted in **Figure 40**, Slovenia is the only country in which more than half of the participants (60.84%) have such a tariff, followed by France (48.46%) and Spain (48.21%) (**Table A.46**). Italy and the Netherlands also show a relatively high share of participants with variable tariffs. On the other hand, Germany has the lowest share of respondents who have a variable energy pricing tariff with only 5.59%, followed by Sweden with 9.32% and the United Kingdom with 13.82%. Moreover, there is a noteworthy proportion of participants in all countries who state that they "do not know", whether they have such a tariff. This is especially the case in Sweden, where the share is the largest, with 28.50% who do not know, whether their electricity price depends on the time of day.

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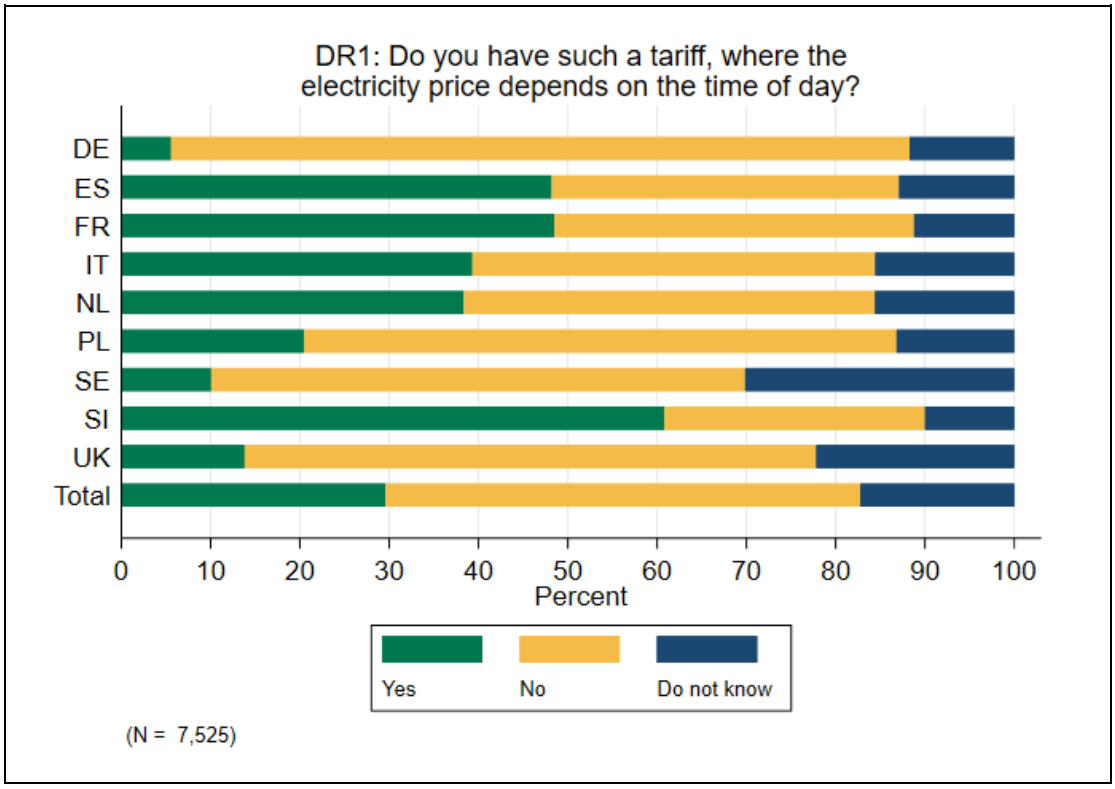

Figure 40: Percentage of households who already have a variable energy pricing tariff (DR1)

As it is illustrated in **Figure 41**, for DR3, the sample (which was already split in half, as the other half was shown the "Attractiveness of Energy Communities" experiment), was divided into two groups, i.e., approximately 375 participants for each country per group. Both groups, Group A and Group B, are shown the following explanation:

"One method to reduce the reliance on fossil fuels for energy supply is to spread out electricity consumption throughout the day. This can for example be done by running energy-intensive appliances during off-peak hours (for example, at night or noon) or by running them when a lot of renewable energy is available (for example, because of strong wind or sunshine)."

Group A is then shown the "provider frame":

"Imagine your energy provider gives you access to an app that notifies you when most of the energy in the grid is produced from renewable sources, which would be an opportune time to save CO2 emissions associated with the use of energy-intensive appliances."

Meanwhile, group B is shown the "energy community frame":

"Imagine you are invited to join a local energy community, which is a group of households in your area who sustain their energy demand by producing renewable energy on their own, for example, through roof-top solar panels. As a member of this community, you are asked to align your energy use with the available energy produced by the community. To do so, your energy community gives you access to an app that notifies when production from renewable sources in your local energy community is high, which would be an opportune time to save CO2 emissions associated with the use of energy-intensive appliances."

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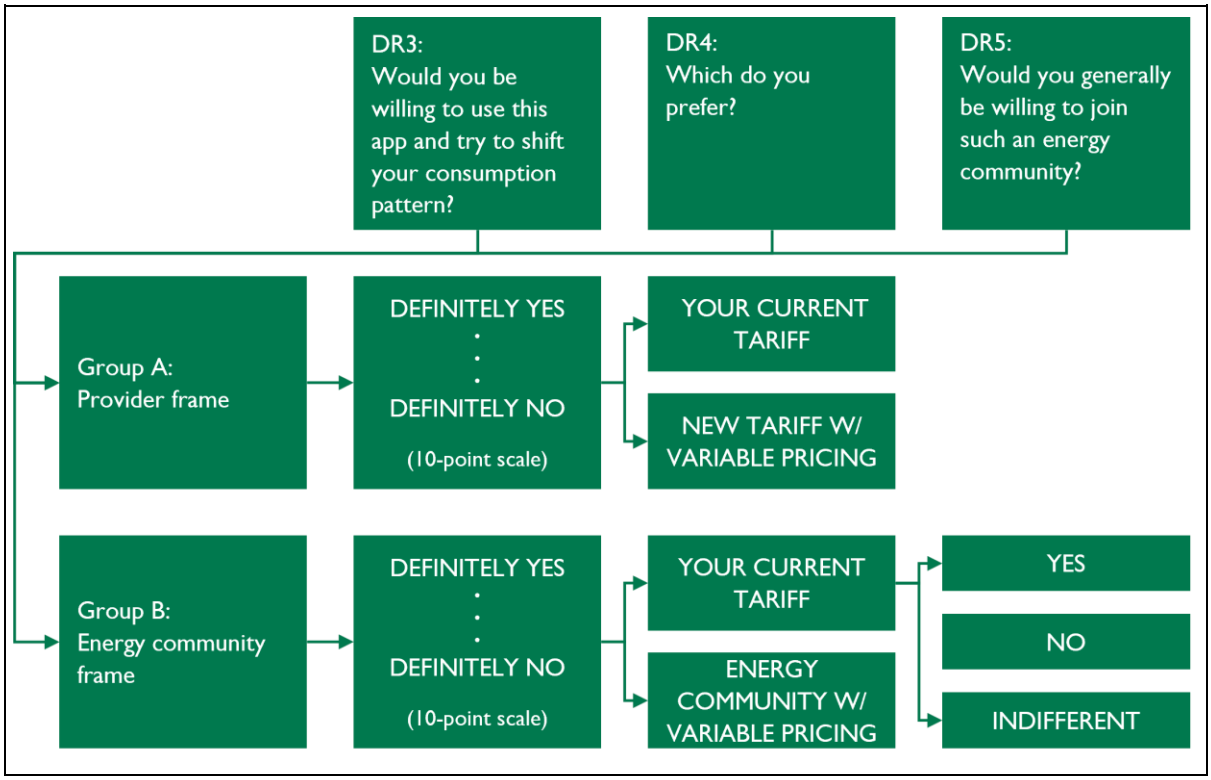

Figure 41: Design and randomisation procedure for demand response experiment

Participants of both groups are then asked on a ten-point scale with 1 "definitely no" to 10 "definitively yes", whether they would be willing to use this app and try to shift their consumption pattern. The mean of Group A is 6.99, while the mean of Group B is slightly lower at 6.74 (**Figure 42** and **Table 17**). Within Group A, when comparing the different countries, the highest mean is 7.73 for the participants from Slovenia (N = 391) and the lowest mean is 6.21 for the participants from the Netherlands (N = 377). Likewise, within Group B, the highest mean is 7.47 for the participants from Slovenia (N = 370) and the lowest mean is 5.97 for the participants from the Netherlands (N = 374). Comparing the medians across the whole samples, no differences between the provider frame and the energy community frame can be detected (**Figure 42**).

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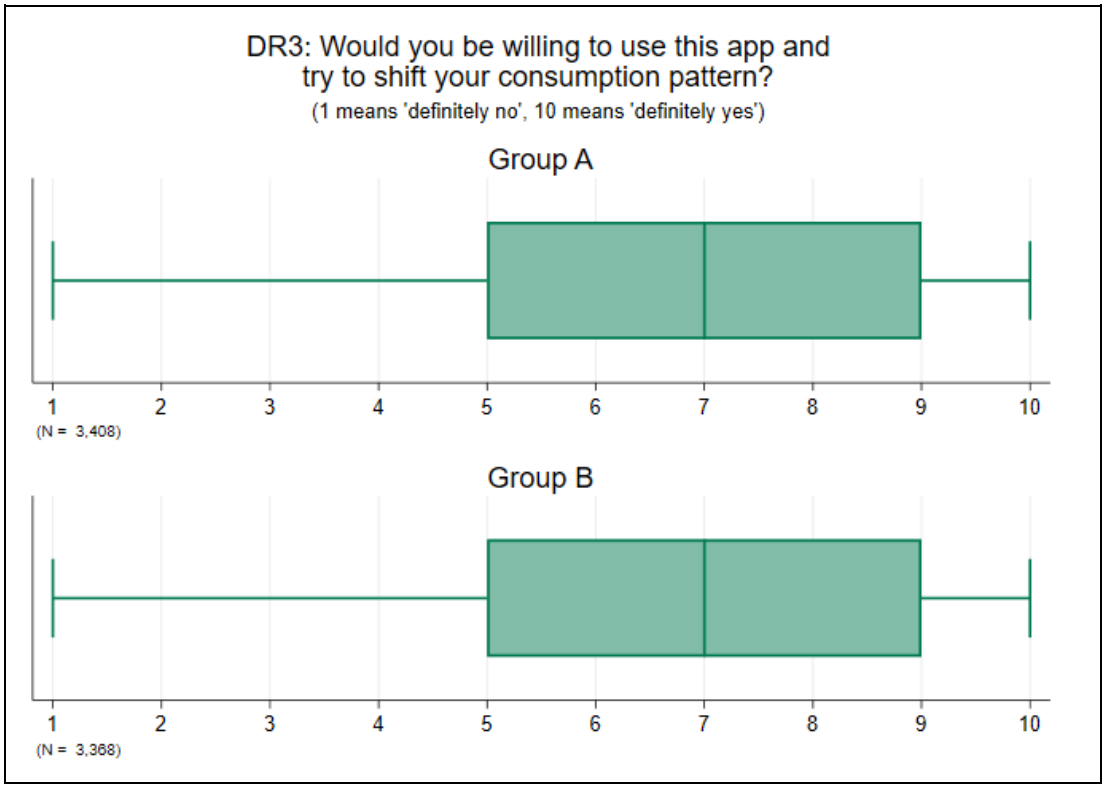

Figure 42: Willingness to use app that signals current market situation via a frame of saving CO2 emissions (DR3)

Table 17: Summary statistics (DR3)

Group	Mean	Std. dev.
A (provider frame)	6.99	2.53
B (energy community frame)	6.74	2.53

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Staying in the same groups of the previous questions, in DR4, the participants of Group A are shown the following text:

> "Now imagine your energy provider offers you to switch to a tariff where the electricity price is updated in real-time.
>
> During the hours of the day when the share of renewable energy is high and the overall electricity demand is low, your electricity price would be lower than your existing tariff. But in hours when the share of renewable energy is low and the overall electricity demand is high, your electricity price would be higher than your existing tariff. An app or in-home display would notify you about the changes in the electricity price throughout the day.
>
> By moving your use of energy-intensive appliances to hours when the share of renewable energy is high and the overall electricity demand is low, you could save up to 5 / 9 cent per kWh. For a typical household, this amounts to saving of €12 / €24 per month."

It is randomised, which amount of possible savings is shown and the amount is adjusted to national energy prices for each country specifically. The values shown here and in **Figure 43** are for Germany, exemplarily. Approximately half of the participants are shown the first, the other half are shown the second amount. The monthly savings are shown according to this randomisation. The group is then asked whether they prefer their current tariff or the new tariff with the described pricing scheme. As **Figure 43** shows, with possible savings of 15%, 57.65% of the participants prefer the new tariff. Out of the participants who are shown possible savings of 30%, 62.60% prefer the new tariff.

For DR4, the participants of Group B are shown the following text:

> "If you are a member of the energy community, you have access to self-produced renewable energy. But in hours when the members of the community use more electricity than is produced by the community, the community needs to buy energy from other suppliers.
>
> During the hours of the day when the amount of self-produced renewable energy is sufficient to cover the electricity demand of all community members, your electricity price would be lower than your existing tariff. But in hours when the community needs to buy energy from other suppliers, your electricity price would be higher than your existing tariff. An app or in-home display would notify you about the changes in the electricity price throughout the day.
>
> By moving your use of energy-intensive appliances to hours when the energy community is self-sustained, you could save up to 5 / 9 cent per kWh. For a typical household, this amounts to saving of €12 / €24 per month."

Again, the randomisation follows the same process as for Group A. The members of Group B are then also asked whether they prefer their current tariff or prefer becoming a member of the energy community with the described pricing scheme. When presented with possible savings of 15%, 52.76% of the participants of Group B prefer becoming a member of the energy community. Meanwhile, for possible savings of 30%, 53.22% of the respondents prefer a member of the energy community.

Hence, if incentivized by saving the same amounts of money, participants are more likely to switch to a new tariff that is provided commercially than joining an energy community with the same conditions. The difference is, however, not very large. Also, the distance between smaller savings and higher savings that can be obtained by switching to a new tariff seems to make a greater difference if provided commercially whereas it does not seem to play a big role for the decision about joining an energy community or not. Further, roughly the same share of people indicates a preference for staying in their old tariff for both pricing schemes. Hence, no statements can be made whether the other half that is willing to join an energy community does even care as much about such saving or if they would like to join one for entirely different reasons.

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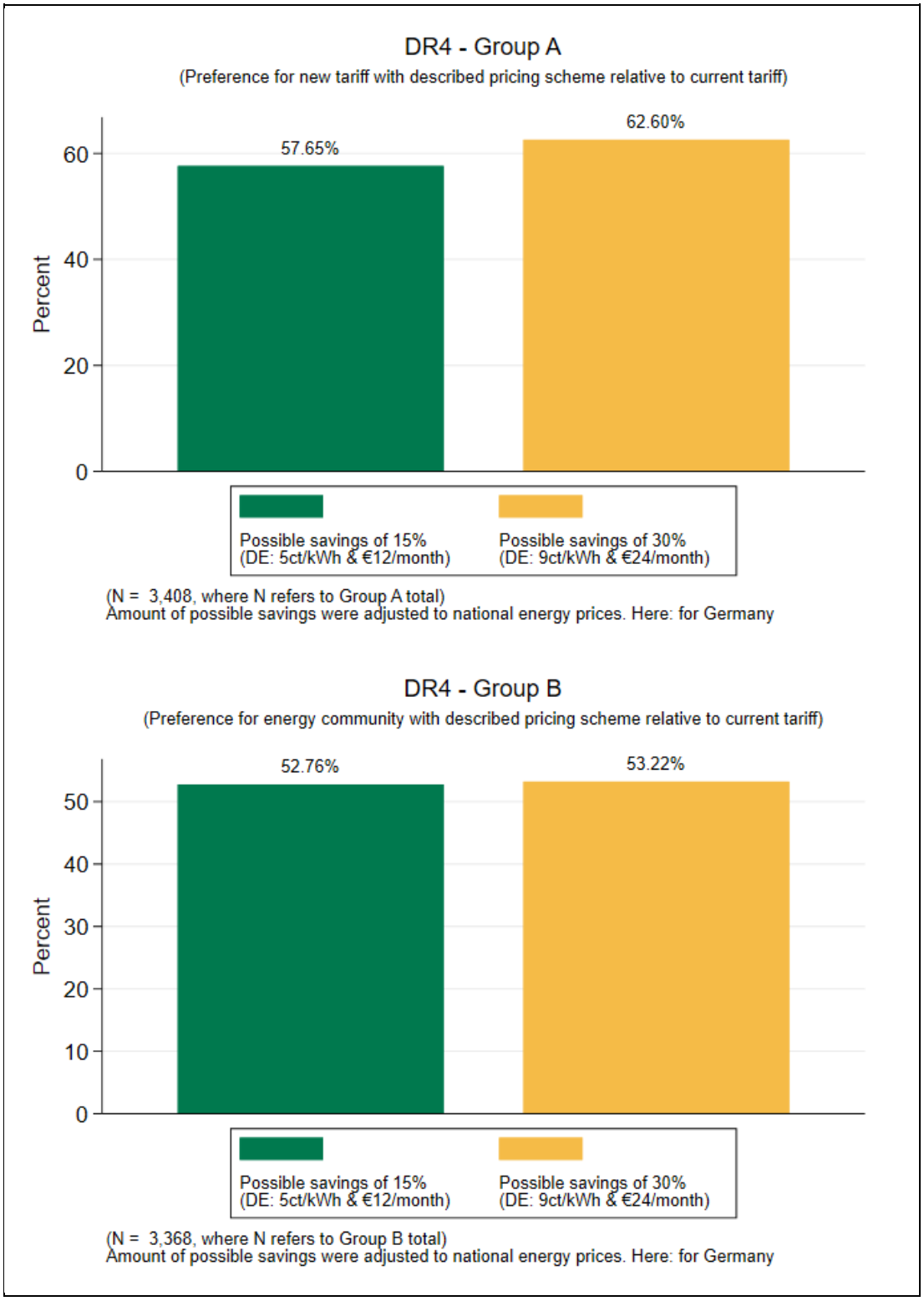

Figure 43: Preference for energy tariff with option of variable pricing that allows saving energy costs (DR4)

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If a respondent is assigned to Group B and replied to DR4 with "Your current tariff", they are shown DR5, which asks: "Given that the electricity tariff is identical to your current tariff, would you generally be willing to join such an energy community?" The sample size for this question is 1,583.

The largest share of the participating sample (37.08%) replies with "no", i.e., they would generally not be willing to join such an energy community given that the electricity tariff is identical to their current tariff (**Figure 44**). This is closely followed by 36.20% of the participants saying that they are "indifferent" and 26.72% replying with "yes", meaning they would generally be willing to join such an energy community given that the electricity tariff is identical to their current tariff. The proportion of participants who are generally willing to join such an energy community is the highest among the participants from Poland with 35.03% and lowest in France with 13.29%. The share of participants who are generally not willing to join such an energy community is the highest in Germany with 43.26% (complemented by the lowest share of indifference among the respondents) and lowest in the United Kingdom with 26.51% of the participants. Meanwhile, the United Kingdom has the largest share of participants who are "indifferent" with 49.40%.

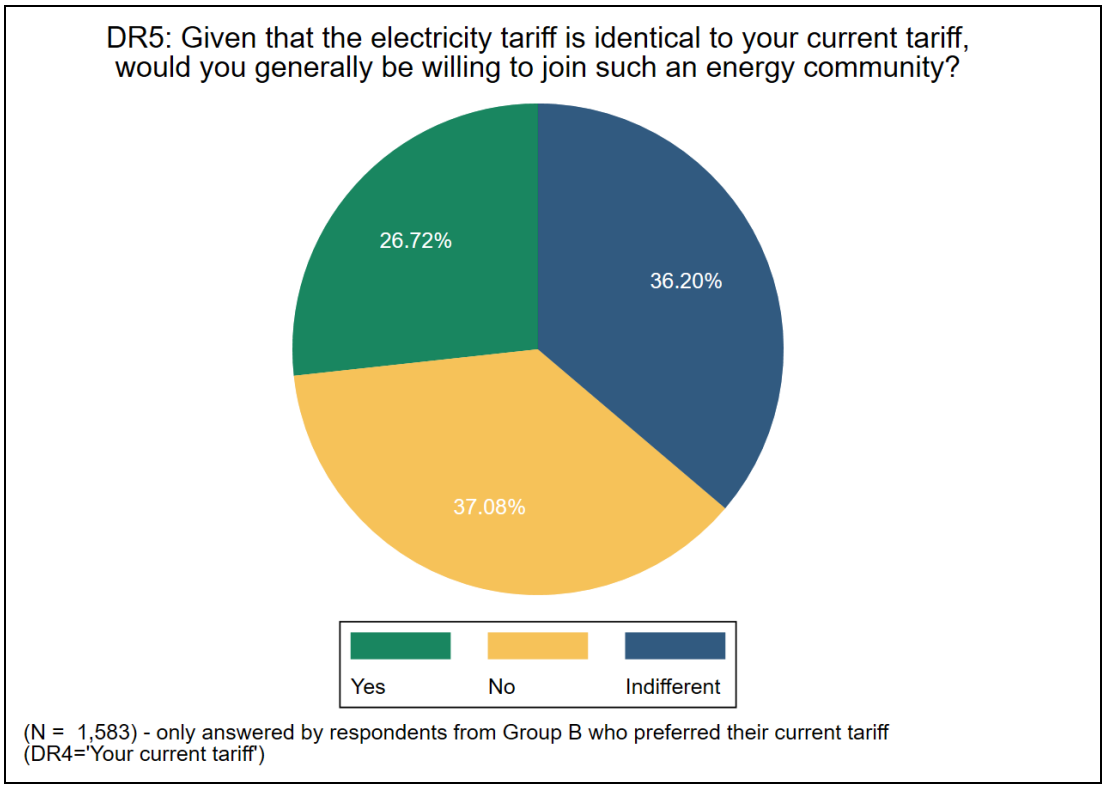

Figure 44: Willingness to join energy community (only for respondents from Group B who preferred current tariff) (DR5)

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3.8 DON – Experiment 3: donation

This chapter examines the results of a third experiment dealing with a donation scenario. After being informed that the participants have the chance to win 100.00 euro (or an equivalent non-euro amount), they have faced two screens. The first screen introduces so-called Micro-Grids: in light of limited to no access to electricity for people in developing countries, Micro-Grids as decentralised power grids establish autonomous energy communities in rural areas. Thereby, they mitigate the impact of alternatively using firewood from rainforests instead of electricity. Subsequently, the second screen presents Atmosfair, a non-profit organisation collecting donations to support Micro-Grids, and informs the respondent that every 100th participant will win 100.00 euro in form of mingle points. Furthermore, everyone can decide how much they would like to donate if they win. While respondents could give their answers in their respective, local currency, for presentation in this report donations are converted [3]to Euro for all countries but not adjusted for purchasing power.

Within the scope of the experiment (DON3), three treatments are applied while comparing them to a control group ("control"). The respective texts, as given in **Table 18**, are each shown to one quarter of the respondents. Treatment 1 (T1) focuses on an arbitrary village and the effect of Micro-Grids on the villagers, treatment 2 (T2) on the respondent actually living in that village and treatment 3 (T3) on living in that village and the effect of Micro-Grids on the respondent's life.

Table 18: Control and treatment texts (DON3)

Group	Text
Control	Before you decide, please reflect on the scenario you read above and consider the role of Micro-Grids for electrification in developing countries.
T1	Before you decide, please imagine a village without power supply. How will the availability of power supply through such a Micro-Grid change the lives of the people living there?
T2	Before you decide, please imagine living in a village without power supply. How will the availability of power supply through such a Micro-Grid change the lives of the people living there?
T3	Before you decide, please imagine living in a village without power supply. How will the availability of power supply through such a Micro-Grid change your own life?

[3] Using exchange rates as during the time of data collection (November 2021).

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As displayed in **Table 19**, across all countries and groups, the minimum and maximum amounts entered to donate are 0.00 and 100.00 euro, respectively. Noteworthily, neither mean nor median ever exceed 50.00 euro. The total median across all groups amounts to approximately one third of the possible maximum donation (control, T2: 30.00 euro; T1, T3: 33.33 euro) while the total mean slightly lies above (control: 36.27 euro; T1: 37.17 euro; T2: 36.47 euro; T3: 38.33 euro). Generally, a consistent pattern for each individual country across groups or each individual group across countries cannot be observed.

Germany in terms of means always lies above the total average except for T3 (37.25 euro), i.e., only when asked about imagining oneself in a village and how a micro-grid would change one's own life, Germans tend to potentially donate less relative to the total average. The standard deviations lie between 30.10 (T2) and 31.49 euro (control). Analogously it can be observed that the Spanish means are always above the total average except for T2 (35.92 euro), i.e., only when asked about imagining oneself in a village and how the people's lives would be affected by such power grids, Spaniards tend to potentially donate below total average. The standard deviations range from 33.21 (T2) to 35.63 euro (T1). For the United Kingdom it can be observed that only for the control group the mean (35.09 euro) is lower than the total average. Thereby, this nation is the sole country for which through the treatments, the mean donations entirely surpass the total averages. The standard deviations lie between 30.01 (control) and 32.87 euro (T1). France's and Poland's means – without any exception – lie below the total averages with standard deviations from 30.39 (control) to 32.14 euro (T1) for France and 24.36 (T2) to 28.98 euro (T3) for Poland. Both countries also have the minimum means across all groups with 31.44 (control), 31.84 (T1), 31.81 (T2), and 32.59 euro (T3) for France and 31.22 (control), 30.37 (T1), 30.28 (T2), and 31.94 euro (T3) for Poland. Conversely, Italy's and the Netherlands' means – without any exception – lie above total average with standard deviations from 28.81 (T1) to 32.42 euro (T3) for Italy and from 33.77 (control) to 35.06 euro (T1) for the Netherlands. The means for Sweden and Slovenia lie equally above and below total average across the different groups and always in the proximity of the total averages. The standard deviations range from 35.84 (T2) to 37.75 euro (T3) for Sweden and from 30.54 (T1) to 32.37 euro (T2) for Slovenia.

In accordance with above results, the minimum means across all groups would potentially be donated by France and Poland with 31.44 (control), 31.84 (T1), 31.81 (T2), and 32.59 euro (T3) for France and 31.22 (control), 30.37 (T1), 30.28 (T2), and 31.94 euro (T3) for Poland. However, the maximum means for the control group would potentially be donated by participants from Italy (41.60 euro), for T1 by Spain (40.78 euro) and Italy (41.00 euro), for T2 by Germany (40.47 euro) and Sweden (39.77 euro), and for T3 by Italy (44.24 euro) and the Netherlands (43.33 euro). When examining whether the treatments on a mean-basis have led the participants to potentially donate more relative to the control group across all treatment groups, this event occurs for Germany, France, Slovenia, and the United Kingdom. On the contrary, the mean donations with respect to single treatment groups fall below the respective control group for Spain (T2, T3), Italy (T1, T2), the Netherlands (T2), Poland (T1, T2), and Sweden (T1).

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Table 19: Amount of donation to Atmosfair (DON3)

Country	Group	Mean	Std. dev.	Median	Min	Max
DE (EUR)	Control	37.12	31.49	30.00	0.00	100.00
	T1	37.65	31.18	40.00	0.00	100.00
	T2	40.47	30.10	50.00	0.00	100.00
	T3	37.25	30.18	40.00	0.00	100.00
ES (EUR)	Control	38.76	34.97	32.50	0.00	100.00
	T1	40.78	35.63	40.00	0.00	100.00
	T2	35.92	33.21	30.00	0.00	100.00
	T3	38.71	33.86	30.00	0.00	100.00
FR (EUR)	Control	31.44	30.39	20.00	0.00	100.00
	T1	31.84	32.14	20.00	0.00	100.00
	T2	31.81	31.61	20.00	0.00	100.00
	T3	32.59	31.70	25.00	0.00	100.00
IT (EUR)	Control	41.60	29.14	50.00	0.00	100.00
	T1	41.00	28.81	50.00	0.00	100.00
	T2	38.22	30.58	40.00	0.00	100.00
	T3	44.24	32.42	50.00	0.00	100.00
NL (EUR)	Control	38.30	33.77	40.00	0.00	100.00
	T1	39.53	35.06	33.50	0.00	100.00
	T2	38.25	34.25	25.00	0.00	100.00
	T3	43.33	35.72	50.00	0.00	100.00
PL (converted to EUR)	Control	31.22	25.46	33.33	0.00	100.00
	T1	30.37	26.08	22.22	0.00	100.00
	T2	30.28	24.36	22.22	0.00	100.00
	T3	31.94	28.98	22.22	0.00	100.00
SE (converted to EUR)	Control	36.95	37.68	20.00	0.00	100.00
	T1	36.84	35.84	30.00	0.00	100.00
	T2	39.77	36.40	50.00	0.00	100.00
	T3	38.20	37.75	30.00	0.00	100.00
SI (EUR)	Control	35.72	31.72	30.00	0.00	100.00
	T1	37.93	30.54	40.00	0.00	100.00
	T2	36.12	32.37	30.00	0.00	100.00
	T3	38.83	31.53	40.00	0.00	100.00
UK (converted to EUR)	Control	35.09	30.01	29.41	0.00	100.00
	T1	39.03	32.87	41.18	0.00	100.00
	T2	37.30	32.09	35.29	0.00	100.00
	T3	39.59	32.84	41.18	0.00	100.00
Total (EUR)	**Control**	**36.27**	**31.96**	**30.00**	**0.00**	**100.00**
	T1	**37.17**	**32.28**	**33.33**	**0.00**	**100.00**
	T2	**36.47**	**31.94**	**30.00**	**0.00**	**100.00**
	T3	**38.33**	**33.08**	**33.33**	**0.00**	**100.00**

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3.9 PS – Prosocial behaviour

To learn more about the social characteristics of the people who are (or are not) interested in energy communities, this part of the questionnaire deals with the participants' prosocial behaviour by asking if they donated any money in the previous year, which was 2020 (PS1). While the share of respondents who donated money is slightly lower in Spain, France, and maybe Italy, it can be said that, overall, about half of the sample has made a donation in the previous year (**Figure 45** and **Table A. 47**).

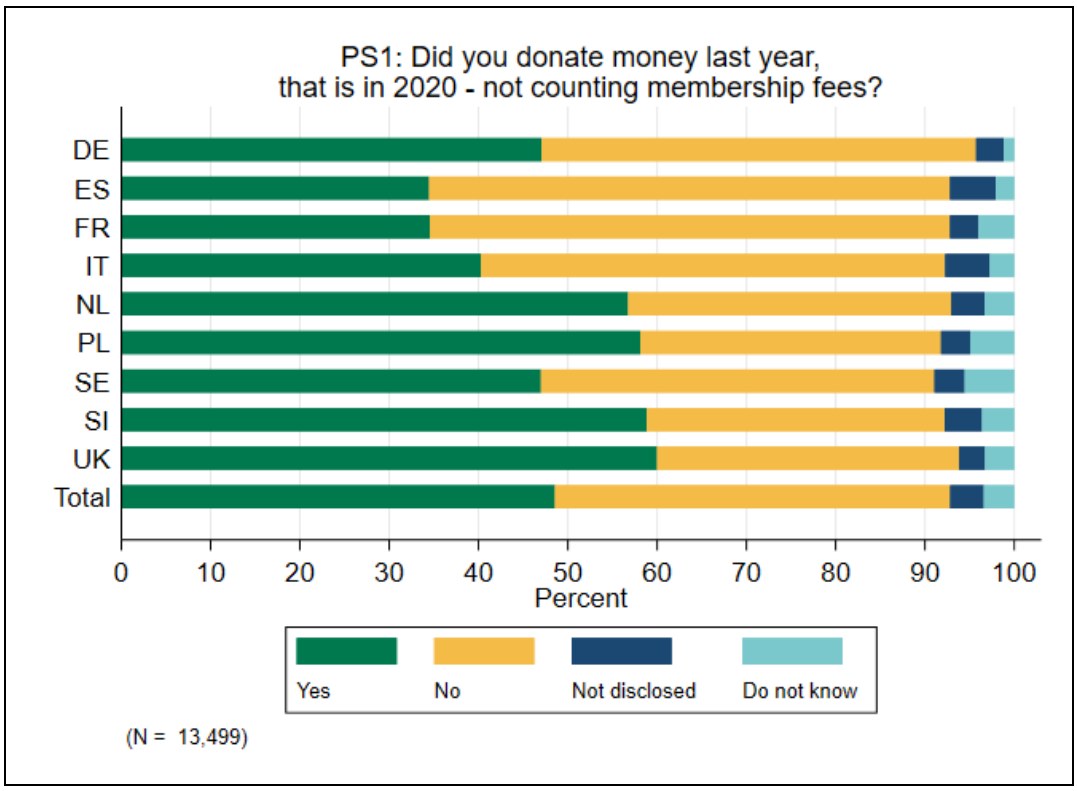

Figure 45: Percentage of households who donated money in previous year (PS1)

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Amongst those who have indicated to have made donations in the previous question (PS1), respondents were then asked for the total (estimated) amount they donated. As shown in **Table 20**, the maximum can be found at 50,000.00 euro in Italy. Further top maximum amounts donated come from Germany (27,000.00 euro), Spain and the Netherlands (each: 10,000.00 euro). Bottom maximum amounts come from France (4,000.00 euro) and Poland (2,597.40 euro). The total median (75.00 euro) and total mean (207.20 euro) differ by 132.20 euro. Germany, Spain, Italy, and the Netherlands (each: 100.00 euro) as well as Sweden (101.21 euro) and the United Kingdom (117.65 euro) have a median greater than the total; France (60.00 euro), Poland (43.29 euro), and Slovenia (50.00 euro) less than the total. This holds analogously for the mean with the maximum mean of 296.89 euro for Germany and the minimum mean of 82.61 euro for Poland. The total standard deviation is 955.80 euro. The minimum standard deviation lies at 162.48 euro for Poland; the maximum at 2,392.06 euro for Italy.

Table 20: Amount of donations in past year (PS2) in EUR

Country	Mean	Std. dev.	Median	Min	Max
DE	296.89	1,303.75	100.00	1.00	27,000.00
ES	228.43	664.91	100.00	3.00	10,000.00
FR	151.21	328.48	60.00	2.00	4,000.00
IT	276.81	2,392.06	100.00	0.00	50,000.00
NL	295.14	770.20	100.00	1.00	10,000.00
PL	82.61	162.48	43.29	0.22	2,597.40
SE	248.74	664.35	101.21	0.30	9,716.60
SI	101.42	337.19	50.00	2.00	8,000.00
UK	225.26	446.67	117.65	1.18	5,882.35
Total	**207.20**	**955.80**	**75.00**	**0.00**	**50,000.00**

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3.10 PC – Psychological concepts

Energy communities can bring together people with different worldviews and with different ways of handling social interactions, in particular conflicts. To ensure an effective collaboration the design of energy communities needs to take these challenges into account and to be inclusive of all the different stakeholders who are involved in a community. Therefore, final topics of interest are the participants' general beliefs, values, and attitudes towards other people as well as in their approach to disputes.

In PC2, the participants read the question "Do you think most people…" and they are given two options to finish the statement. The majority of the respondents (57.94%) reply with "…would take advantage of you if they had the opportunity", as opposed to 42.06% of the participants who say that most people "would try to be fair to you" (**Figure 46** and **Table A.48**). The majority of the participants in all countries say that most people "would take advantage of you if they had the opportunity", with the exception of the participants in the Netherlands and in Sweden, where 56.24% and 52.27% respectively think that most people "would try to be fair to you". The largest share of participants who think that most people "would take advantage of you if they had the opportunity" can be found in Italy with 68.80%.

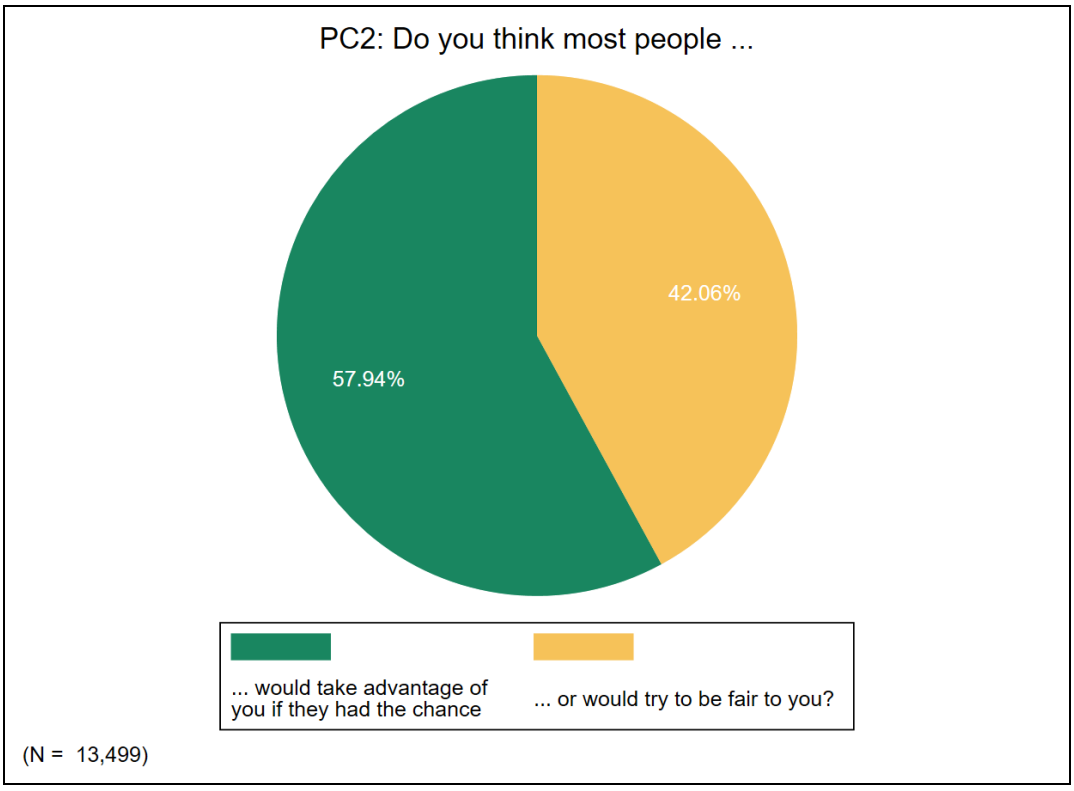

Figure 46: Trust in other people (PC2)

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PC3 is designed the same way as PC2, with the question being "Would you say that most of the time people…", again, with two different options to reply. The majority of the participants (63.59%) respond by saying that most of the time people "only pursue their own interest" (**Figure 47** and **Table A.49**). On the other hand, 36.41% of the respondents say that most of the time people "try to be helpful". The majority of the participants in all countries say that people "only pursue their own interest", with the exceptions here being the participants in Sweden and the United Kingdom, where 53.80% and 55.20% respectively say that most of the time people "try to be helpful". The largest share of participants who think that most of the time people "only pursue their own interest" can be found in France with 78.13%.

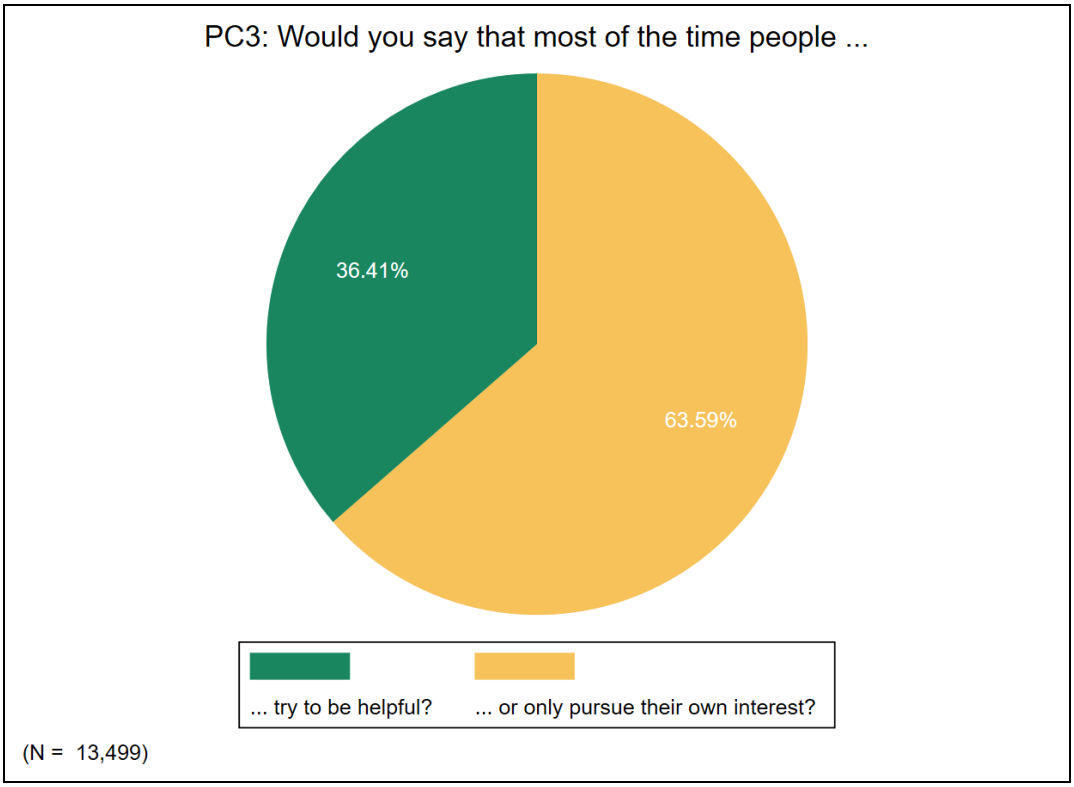

Figure 47: Altruism of other people (PC3)

Question PC6 deals with the inclusion of others in the self, i.e., the extent to which the participant feels personally connected to other people. The respondents are shown seven diagrams (cf. **Figure 48**) about the varying degrees of the relationship, ranging from no (no. 1) over moderate (no. 4) to complete (no. 7) connectedness. By construction, the share of participants answering "very connected" (i.e., no. 7) when asked about the connection to the person they feel closest to is the highest in PC6a (48.12%), so that 80.61% in total feel more than moderately connected (**Figure 49** and **Table A.50**). 11.24% in total feel less than moderately connected. The remaining 8.15% lie in between. The results for PC6b (connection to best friend) look similar, but with more participants feeling less connected. Here, 18.43% feel "very connected", and approximately the same share sees a connection to the fifth (24.91%) and sixth (24.88%) degree. The share of less than moderately connected feeling respondents grows by 6.03 percentage points in total, and the share of moderates almost doubles (14.51%). Conversely, when it comes to the perceived connection between the respondent and a stranger (PC6c), only 9.79% in total feel more than moderately connected, and a little over four fifth in total see a less than moderate relationship. Of those, 46.17 percentage points feel not at all connected. Analogously to PC6b (relative to PC6a), in PC6d (connection to others in general), the observed

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outcome is similar to PC6c, but this time with more participants feeling more than moderately connected to other people (18.71% in total). 16.30% feel not at all connected, and 20.25% perceive a moderate connection. The results of PC6e (connection to family members) are similar to PC6a. Among those feeling more than moderately connected, the shares of degrees no. 5 (17.36%), 6 (24.39%), and 7 (35.23%) are distributed more equally. 12.76% in total see the relationship as less than moderately close, leaving 10.25% to rate it as moderate.

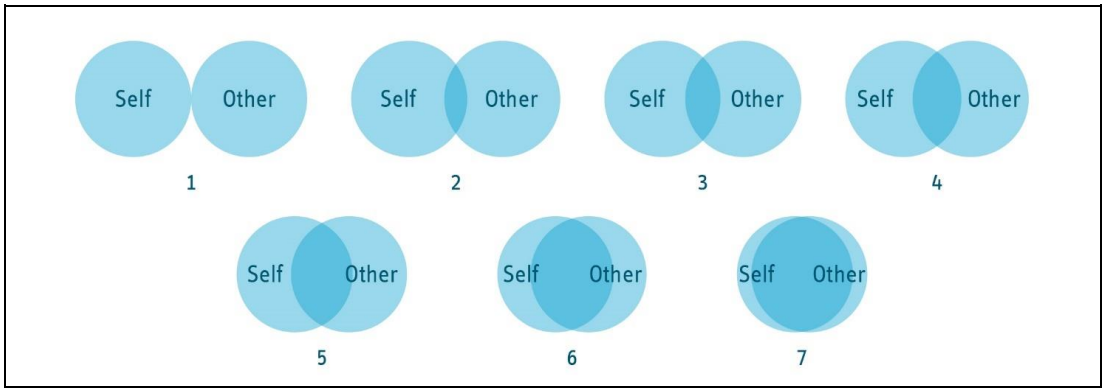

Figure 48: Inclusion others in self (PC6) – degrees of relatedness or connectedness with some other person or thing

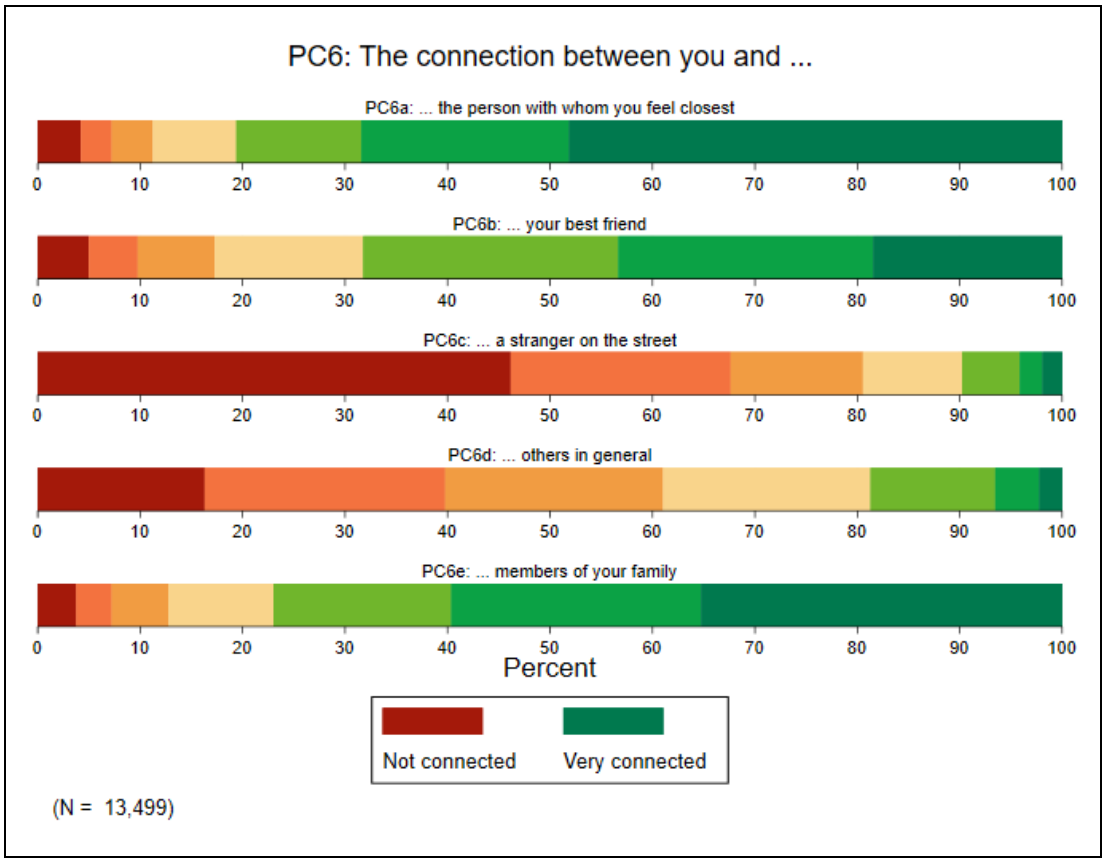

Figure 49: Inclusion of others in self (PC6)

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PC4 deals with different statements on the topics of individualism and collectivism on a Likert scale with nine options ranging from "Do not agree at all" to "Do fully agree". As **Figure 50** shows, the largest share of participants (31.74%) "do fully agree" with statement PC4a "I'd rather depend on myself than others" (**Table A.51**). A total of 82.21% of the respondents tend to agree with the statement, while only 1.27% of the participants "do not agree at all". Responding to the statement "I rely on myself most of the time, I rarely rely on others" (PC4b), the share of participants who "do fully agree" with the statement is lower compared to the first statement but still the largest with 21.76%. The share of participants who tend to agree drops, as well, by roughly 7 percentage points (with a total of 75.09%). The opinions of these first two statements, PC4a and PC4b, are in line with the findings from PC2, i.e., the impression the majority of the participants have that most people would take advantage of them if they had the chance, and PC3, i.e., that the majority of the participants say that most of the time people only pursue their own interest. "I often do my own thing" (PC4c) is a statement with which 22.96% "fully agree", while the largest share of participants (23.32%) generally agree. Less than one percent (0.99%) does "not agree at all" with the statement. Statement PC4d, "My personal identity, independent of others, is very important to me" also adds to the described individualism of the participants with the largest share of the respondents (28.27%) who "fully agree" and even less of the sample who tend to disagree with a total of only 6.16%. In the context of collectivism, a total of 79.72% of the participants tend to agree with the statement "If a co-worker gets a prize, I would feel proud" (PC4e). 29.26% of the participants "fully agree" with the statement. Similarly, in response to the statement "The well-being of my co-workers is important to me" (PC4f), a total of 80.51% tend to agree, although the proportion of participants who "fully agree" is slightly lower with 23.22%. More than two thirds of the participating sample (a total of 73.61%) tend to agree with the following statement "To me, pleasure is spending time with others" (PC4g). However, there is also a higher share of respondents who tend to disagree compared to the other collectivism-related statements with a total of 11.65%. Again, as for all the previous statements of PC4, the vast majority (78.37%) tend to agree with the final statement, which reads "I feel good when I cooperate with others" (PC4h).

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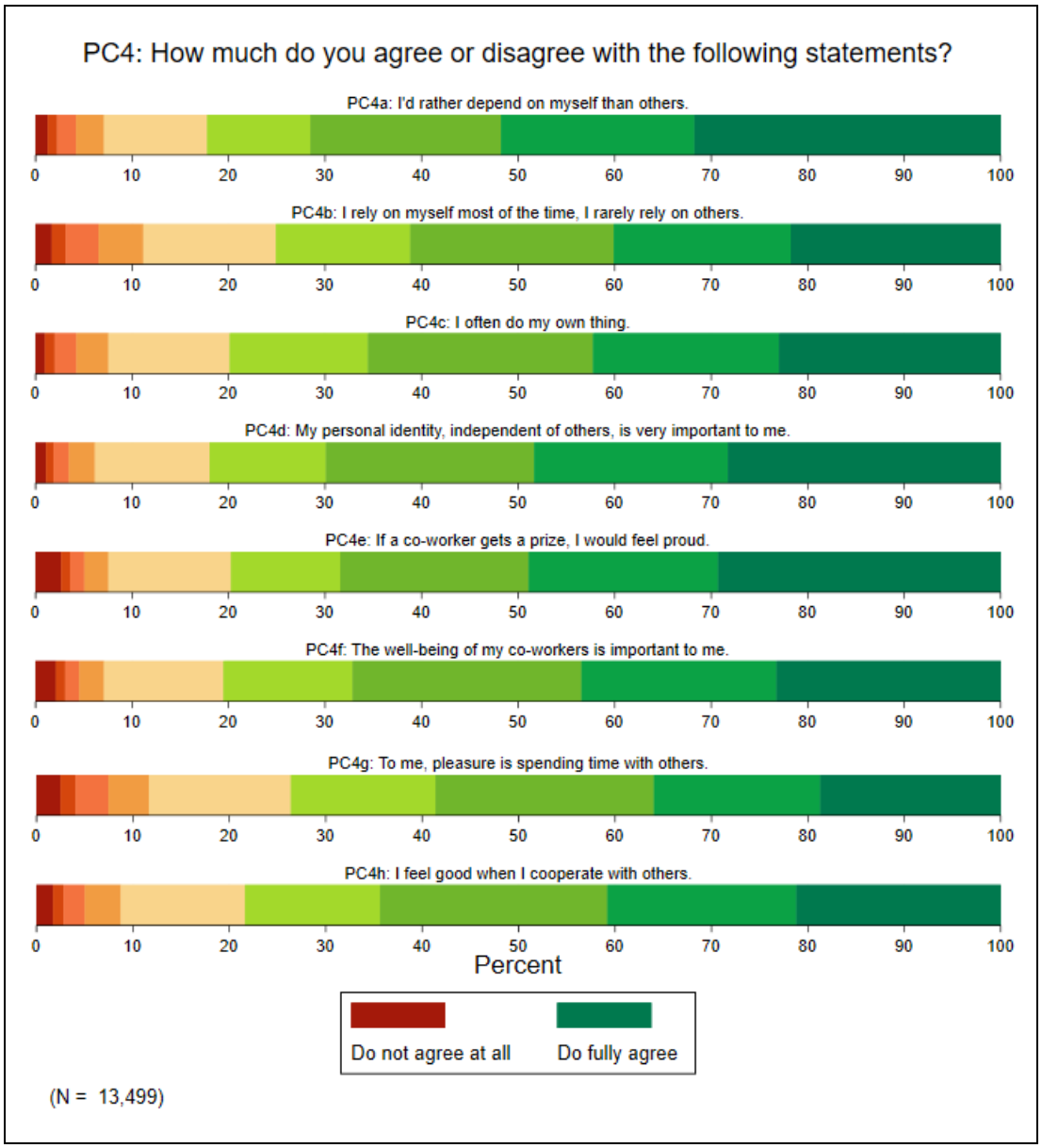

Figure 50: Individualism/collectivism (PC4)

As displayed in PC5, the participants are asked for their opinion on multiple questions regarding long-term orientation (**Figure 51**). In PC5a, a quarter (25.43%) "fully agree" with the statement that respect for tradition is important to them (**Table A.52**). Further 44.80% in total generally agree, while 16.44% are indifferent, 9.98% in total generally disagree, and 3.36% "do not agree at all". When questioned about whether they plan long-term (PC5b), there is a slight increase in disagreeing respondents: 3.72% "do not agree at all", 10.90% generally disagree, 47.93% generally agree, and 19.36% "fully agree". The replies in the statement about the importance of family heritage (PC5c) reveal a shift to the margins with 5.65% who "do not agree at all" and 24.19% who "fully agree". On whether a strong link to their past is valued (PC5d), 40.91% state that they are indifferent (20.88%) or disagree ("do not agree at all": 5.17%, generally disagree: 14.87% in total) – the highest share of non-agreeing participants throughout PC5. PC5e ("I work hard for success in the future") largely follows the frequency distribution of PC5a (4.22% "do not agree at all", while 22.54% "fully agree"). Yet, 7.86 percentage points more respondents of PC5f compared to PC5e (i.e., 39.49% in total) do not at least agree with the statement to give up

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today's fun for success in the future. 41.98% in total generally agree, and 18.53% "fully agree". In PC5g, the respondents are asked whether traditional values play an important role to them. 3.75% "do not agree at all" and 10.92% in total generally disagree on the one hand. 43.86% in total generally and 25.58% fully agree on the other. The highest share of agreeing participants is recorded for the final statement (PC5h). While 29.66% "fully agree" and 52.78% in total generally agree with whether persistence is important to them, only 4.49% in total either fully or generally disagree. The residual 13.07% remain undecided.

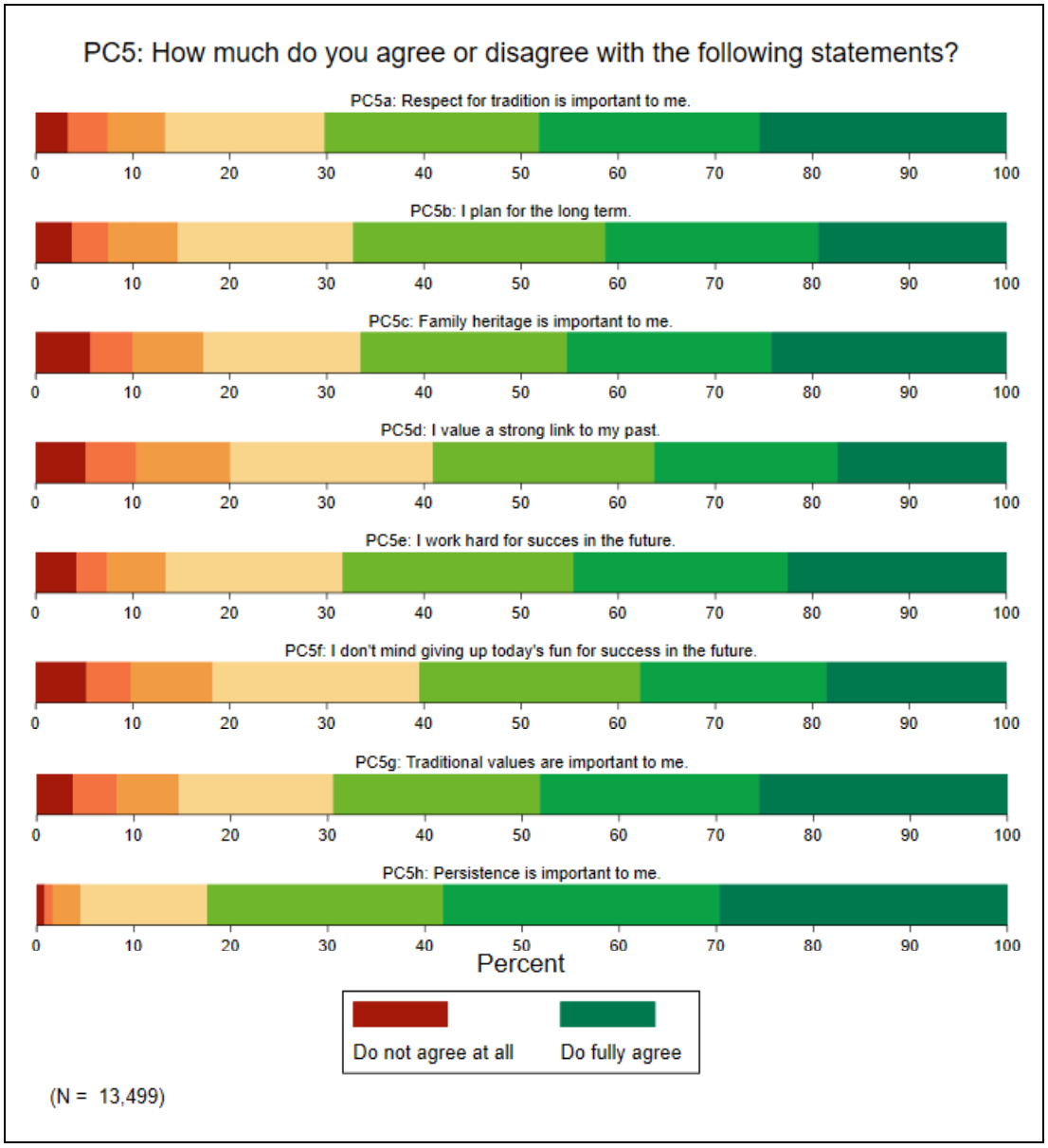

Figure 51: Long-term orientation (PC5)

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PC7 deals with the locus of control of the participants, who are asked how much they agree or disagree with the presented statements. As shown in **Figure 52**, the largest share of participants (23.51%) neither agree nor disagree with the first statement which is "I have little control over the things that happen to me" (PC7a) (**Table A.53**). However, more respondents tend to disagree (a total of 44.49%) compared to those who tend to agree (a total of 31.99%). The overall results remain the same for the second statement, "There is really no way I can solve some of the problems I have" (PC7b), again, with the largest share of the participating sample (20.58%) neither agreeing nor disagreeing. However, the share of those who tend to disagree with this statement (a total of 40.05%) is almost equal to the share of participants who tend to agree (a total of 39.37%). For the following statement, "There is little I can do to change many of the important things in my life", (PC7c), the replies reveal a shift towards the results of PC7a, with the largest share of respondents (22.05%) who neither agree nor disagree. Again, there is a higher proportion of participants who tend to disagree (a total of 44.19%) compared to those who tend to agree (a total of 33.76%). Similarly, PC7d, "I often feel helpless in dealing with the problems of life", shows comparable results to those of PC7b with a total of 42.34% who tend to disagree and a total of 37.68% who tend to agree with the statement. "Sometimes I feel that I'm being pushed around in life" (PC7e) is a statement with which just slightly more of the respondents (a total of 40.73%) tend to agree than disagree with (a total of 38.17%). PC7f, "What happens to me in the future mostly depends on me", shows different results to all previous statements of PC7, as more than two thirds of the participants (a total of 71.78%) tend to agree with the statement, while only a total of 10.88% tend to disagree. Even though the majority of the participants (a total of 60.26%) tend to agree with the statement "I can do just about anything I really set my mind to do" (PC7g), the share is lower by 11.52 percentage points compared to the previous statement. Meanwhile, the share of participants who tend to disagree increases by 7.02 percentage points.

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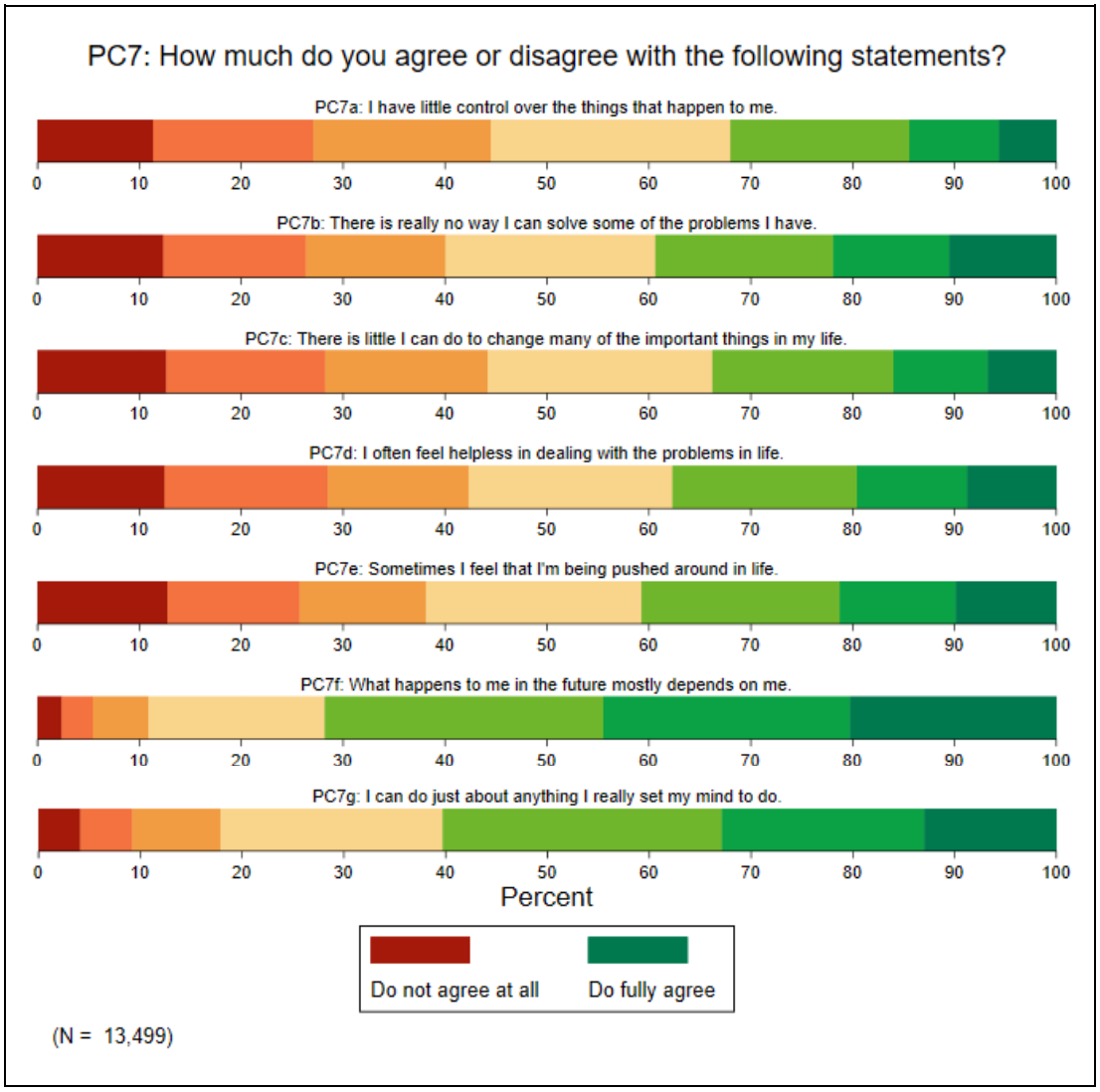

Figure 52: Locus of control (PC7)

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4 CONCLUSION

The aim of Deliverable 6.3 was to investigate the preferences and attitudes of European citizens towards a renewable energy transition, beneficial designs of energy communities, and demand response programmes based on the Citizen Survey on Energy Communities. In particular, this work examined the attitudes of the general public, including people who have often not yet made experiences with energy communities. Approximately 1,500 participants in each of nine European countries (Germany, Spain, France, Italy, the Netherlands, Poland, Sweden, Slovenia, and the United Kingdom) were sampled, allowing for cross-country comparisons. The survey additionally includes randomised experiments.

As the results of the survey underline, a willingness for a transition to producing and using renewable energies is evident across the entire sample. It is found throughout all nine countries that protecting the environment is of importance to the vast majority of the participants. Moreover, the respondents find climate change to be a serious problem. In this way, the survey shows that moving to renewable energy sources, being energy efficient, and conserving energy is important to the participating sample. Matching this attitude, a substantial share of the participants who do not yet have a green electricity tariff (about 40%) could well imagine switching to one. In this regard, it also turns out that among all participants an increase in the energy efficiency of buildings is considered to be the most popular amongst a number of presented policy measures concerning the energy transition. More than two thirds (67.65%) of the respondents agree with a phase-out of coal as a source of energy, while less than half of the sample (46.10%) agree with a nuclear phase out and/or refraining from the use of nuclear energy. Meanwhile, there seems to be some disagreement among the participants of the survey regarding the distribution of energy costs in their countries, which can also be seen by the differing opinions in a cross-country comparison with varying degrees of perceived fairness concerning the distribution of costs.

One particularly important finding of this Citizen Survey is that only 16% of the participants are aware of energy communities. The awareness is highest in the Netherlands with 29.29% of all participants and lowest in France with only 9.07%. Among those who already knew about energy communities, the Citizen Survey finds that the Internet, social and local media are mostly cited as sources for becoming aware of energy communities. In addition, only 3.69% of the entire sample are members of an energy community (498 participants out of 13,499). Out of those who are aware of energy communities, this proportion makes up 23.06%. Yet, there are also clear country differences regarding energy community membership, with the highest share of participants being energy community members in the Netherlands (8.94%) and the lowest in France (0.80%). Informing the general public about the concept of energy communities as well as about existing ones should therefore be considered as a first and obvious step for the promotion of energy community membership and the establishment of new communities.

According to the survey participants, the main motivation to be part of an energy community is the environmental benefit. The economic benefits are considered as being slightly less important. Further, more than 80% of the survey participants who were already aware of energy communities consider energy communities to be "important" or even "very important" for the transition towards a sustainable energy system. These results are in line with the findings from Deliverable 6.2 (Medved et al., 2021), in which members of selected energy communities recognise the environmental motive as the most prevalent one. The majority of all survey participants also consider other potential benefits of energy communities to be important. In particular, the benefit of reducing electricity costs, reducing fossil fuel consumption, and contributing to their own energy security are most frequently rated as important potential benefits. Furthermore, energy communities are understood as a means that contributes to a fairer energy transition. Participants find investing and earning money through energy communities important, but not as important as many other aspects. Members of energy communities are more convinced of the importance of the benefits that energy communities can provide than non-

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members. It cannot be assessed, however, to which degree this difference is due to self-selection. Specifically, it could be that experience with energy communities leads to an even more positive impression of them. Alternatively, however, it could also be self-selection that we find here: the people who rate energy communities most positively are also members of them. Moreover, there generally seems to be an overall lack of clarity regarding the benefits of energy communities, with almost half of the participants reporting that they are unsure whether they understand the benefits of energy communities.

The unawareness of energy communities is reported as the primary reason for not joining them, followed by a lack of skills and knowledge, a barrier which has previously been identified by Deliverable 3.3 (Palm, 2021). The barriers are very similar for not starting an energy community, while starting or getting actively involved in an initiative to create an energy community is perceived to be more knowledge-intensive, costly, and time-consuming than joining an existing energy community. Nonetheless, amongst current non-members, 10.25% state to have already considered joining an energy community and 9.18% have even considered starting one. Out of the remaining participants, about 30% are at least generally willing to join an energy community and about 20% could imagine starting an initiative. These findings suggest that there is a great potential for energy communities and that the expected benefits of energy communities are wide-ranging, as also discussed in Deliverable 6.1 (Kamin et al., 2020). However, the results further indicate that the full potential of energy communities is not yet utilised.

The conducted choice experiment points out how energy communities should be designed in order to be appealing to European citizens. As described above, the economic benefits of energy communities is highly important to the participants. The finding that participants strongly value the financial benefits is consistent across all nine countries. The experiment further reveals that participants seem to dislike any kind of community type, whether local or virtual, where there is no personal contact among community members. A strong desire to be actively involved in the decision-making process of the energy community can also be observed across all countries. Having to make investments or having the option to make investments into the energy community, on the other hand, does not seem to be attractive to the participants. Therefore, we can conclude that most European citizens will be more inclined to join an energy community if this entails a financial benefit for them and if they get a chance to participate in the decision-making of the community.

Another topic analysed as part of the survey is about demand response mechanisms. Results reveal large differences across the nine countries in the use of such mechanisms, where the price for electricity depends on the time of the day and/or the current overall demand. Some countries show very large proportions of people who already use variable tariffs (60.84% in Slovenia, 48.46% in France, and 48.21% in Spain) whereas in other countries this does not seem to be very common at all (5.59% in Germany, 9.32% in Sweden, and 13.82% in the United Kingdom). An experiment on demand response mechanisms identifies that most participants would generally consider switching to a tariff with a variable price for electricity. It is further investigated if these preferences depend on whether the variable tariff is administered through a conventional energy provider or an energy community and how important reducing costs and emissions is to potential users. While there seems to be some preference for switching to commercial energy providers given the same pricing scheme, those who are willing to join an energy community do not necessarily seem to make their decision dependent on the amount of costs than can be saved by doing so.

Finally, the survey examined how participants behaved in a donation scenario about provision of microgrid electricity in developing countries, how they behaved prosocially in the past, and how they responded to psychologically themed questions regarding beliefs, values, and attitudes. The donation experiment concluded in the observation that the median donation in the experiment is approximately one third of the amount promised to them if they win. Apart from that, across all countries, about half

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of the participants donated in the past year with an average of 207.20 euro. There do, however, exist large outliers. On psychological concepts, it is reported that the majority believes that most people would take advantage of a person if they had the chance and that people rather pursue their own interests. Furthermore, as expected, the farther the formal relationship between the respondent and another person is, the farther they perceive the connection to that person. Lastly, their opinion on individualism/collectivism, long-term orientation, and locus of control were studied.

To sum up, this international survey on energy topics and energy communities, in particular, reveals three main insights: Firstly, there seems to be only a mixed knowledge regarding energy issues and, more specifically, at best a limited awareness about the concept and the possibilities of energy communities in most European countries. This implies unexploited potential to expand the reach of energy communities and thereby to promote improvements arising from them. Secondly, while specific benefits are not as clear to people, energy communities are conceptually seen in a favourable light by most. Since respondents revealed to care about environmental as well as monetary issues, making clearer the links between energy communities and their potential, including direct benefits to members as well as larger-scale improvements, such as environmental friendliness and fairness in the energy transition, may be of great importance. Thirdly, barriers that hinder people from joining and starting energy communities should be removed, which does not only include the lack of awareness, but also spans to insufficient skills and resources. In some cases, even insecurities or reservations about one's (potential) community members' behaviour may play a role; something that could be addressed by promoting diverse and novel configurations of energy communities. Overall, this report recommends opening the concept of energy communities to a vastly broader audience and maximising their attractiveness such that the energy transition can proceed faster, smoother, and more viably.

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APPENDIX

Table A.1: Frequency distribution: Distribution of education levels (S8)

Country	Below upper secondary	Upper / post-secondary	Tertiary
DE	293	817	390
	19.53%	54.47%	26.00%
ES	440	525	535
	29.33%	35.00%	35.67%
FR	179	813	508
	11.93%	54.20%	33.87%
IT	397	816	287
	26.47%	54.40%	19.13%
NL	257	700	542
	17.14%	46.70%	36.16%
PL	92	985	423
	6.13%	65.67%	28.20%
SE	224	757	519
	14.93%	50.47%	34.60%
SI	59	1,001	440
	3.93%	66.73%	29.33%
UK	240	632	628
	16.00%	42.13%	41.87%
Total	**2,181**	**7,046**	**4,272**
	16.16%	**52.20%**	**31.65%**

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Table A.2: Frequency distribution: Political orientation (S18)

Country	Far left	1	2	3	4	5	6	7	8	9	Far right	Cannot find my position	Not interested in politics	Not disclosed
DE	19	39	71	147	160	388	176	128	70	19	20	108	107	48
	1.27%	2.60%	4.73%	9.80%	10.67%	25.87%	11.73%	8.53%	4.67%	1.27%	1.33%	7.20%	7.13%	3.20%
ES	36	51	156	187	140	239	92	99	82	44	37	103	183	51
	2.40%	3.40%	10.40%	12.47%	9.33%	15.93%	6.13%	6.60%	5.47%	2.93%	2.47%	6.87%	12.20%	3.40%
FR	19	29	79	107	65	160	87	95	94	41	63	301	252	108
	1.27%	1.93%	5.27%	7.13%	4.33%	10.67%	5.80%	6.33%	6.27%	2.73%	4.20%	20.07%	16.80%	7.20%
IT	30	34	94	138	85	153	90	120	112	32	39	244	240	89
	2.00%	2.27%	6.27%	9.20%	5.67%	10.20%	6.00%	8.00%	7.47%	2.13%	2.60%	16.27%	16.00%	5.93%
NL	20	28	86	108	92	188	142	220	174	59	36	120	176	50
	1.33%	1.87%	5.74%	7.20%	6.14%	12.54%	9.47%	14.68%	11.61%	3.94%	2.40%	8.01%	11.74%	3.34%
PL	38	28	68	108	71	280	96	128	93	65	87	155	213	70
	2.53%	1.87%	4.53%	7.20%	4.73%	18.67%	6.40%	8.53%	6.20%	4.33%	5.80%	10.33%	14.20%	4.67%
SE	19	38	87	154	131	205	151	174	110	40	43	50	211	87
	1.27%	2.53%	5.80%	10.27%	8.73%	13.67%	10.07%	11.60%	7.33%	2.67%	2.87%	3.33%	14.07%	5.80%
SI	36	50	77	131	97	173	57	66	66	34	53	232	389	39
	2.40%	3.33%	5.13%	8.73%	6.47%	11.53%	3.80%	4.40%	4.40%	2.27%	3.53%	15.47%	25.93%	2.60%
UK	30	19	78	114	123	306	141	99	75	30	35	100	310	40
	2.00%	1.27%	5.20%	7.60%	8.20%	20.40%	9.40%	6.60%	5.00%	2.00%	2.33%	6.67%	20.67%	2.67%
Total	**247**	**316**	**796**	**1,194**	**964**	**2,092**	**1,032**	**1,129**	**876**	**364**	**413**	**1,413**	**2,081**	**582**
	1.83%	**2.34%**	**5.90%**	**8.85%**	**7.14%**	**15.50%**	**7.65%**	**8.36%**	**6.49%**	**2.70%**	**3.06%**	**10.47%**	**15.42%**	**4.31%**

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 837752.

Table A.3: Absolute target and sample age distribution per country (S4)

Country	Absolute target age distribution					Absolute sample age distribution				
	18-29 years	30-39 years	40-49 years	50-59 years	60-69 years	18-29 years	30-39 years	40-49 years	50-59 years	60-69 years
DE	302	288	272	359	280	255	290	272	393	290
ES	273	285	365	328	249	270	283	362	332	253
FR	321	291	301	308	280	317	289	300	307	287
IT	273	258	337	355	277	267	258	343	355	277
NL	343	276	284	325	272	284	285	293	336	301
PL	297	339	311	260	292	297	340	311	260	292
SE	351	310	294	294	251	349	310	294	294	253
SI	267	302	323	317	292	266	302	323	317	292
UK	353	302	295	307	243	284	317	315	325	259

Table A.4: Absolute and relative differences between target and sample age distribution per country (S4)

Country	Absolute differences between target and sample age distribution					Relative differences between target and sample age distribution				
	18-29 years	30-39 years	40-49 years	50-59 years	60-69 years	18-29 years	30-39 years	40-49 years	50-59 years	60-69 years
DE	-47	2	0	34	10	-15.56%	0.69%	0.00%	9.47%	3.57%
ES	-3	-2	-3	4	4	-1.10%	-0.70%	-0.82%	1.22%	1.61%
FR	-4	-2	-1	-1	7	-1.25%	-0.69%	-0.33%	-0.32%	2.50%
IT	-6	0	6	0	0	-2.20%	0.00%	1.78%	0.00%	0.00%
NL	-59	9	9	11	29	-17.20%	3.26%	3.17%	3.38%	10.66%
PL	0	1	0	0	0	0.00%	0.29%	0.00%	0.00%	0.00%
SE	-2	0	0	0	2	-0.57%	0.00%	0.00%	0.00%	0.80%
SI	-1	0	0	0	0	-0.37%	0.00%	0.00%	0.00%	0.00%
UK	-69	15	20	18	16	-19.55%	4.97%	6.78%	5.86%	6.58%

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Table A.5: Absolute target and sample gender distribution as well as absolute and relative differences per country (S3)

Country	Absolute target gender distribution		Absolute sample gender distribution		Absolute differences		Relative differences	
	Female	Male	Female	Male	Female	Male	Female	Male
DE	743	757	742	758	-1	1	-0.13%	0.13%
ES	752	748	752	748	0	0	0.00%	0.00%
FR	765	735	767	733	2	-2	0.26%	-0.27%
IT	754	746	779	721	25	-25	3.32%	-3.35%
NL	747	753	746	753	-1	0	-0.13%	0.00%
PL	757	743	757	743	0	0	0.00%	0.00%
SE	735	765	801	699	66	-66	8.98%	-8.63%
SI	723	777	723	777	0	0	0.00%	0.00%
UK	754	746	754	746	0	0	0.00%	0.00%

Table A.6: Absolute target and sample distribution of education levels per country (S8)

Country	Absolute target distribution of education levels			Absolute sample distribution of education levels		
	Below upper secondary education (ISCED 0-2)	Upper secondary or post-secondary non-tertiary education (ISCED 3-4)	Tertiary education (ISCED 5-8)	Below upper secondary education (ISCED 0-2)	Upper secondary or post-secondary non-tertiary education (ISCED 3-4)	Tertiary education (ISCED 5-8)
DE	293	818	390	293	817	390
ES	594	380	527	440	525	535
FR	351	642	507	179	813	508
IT	597	642	261	397	816	287
NL	383	596	522	257	700	542
PL	200	878	423	92	985	423
SE	312	623	567	224	757	519
SI	237	824	440	59	1,001	440
UK	288	603	609	240	632	628

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Table A.7: Absolute and relative differences between target and sample distribution of education levels per country (S8)

Country	Absolute differences between target and sample education distribution			Relative differences between target and sample education distribution		
	Below upper secondary education (ISCED 0-2)	Upper secondary or post-secondary non-tertiary education (ISCED 3-4)	Tertiary education (ISCED 5-8)	Below upper secondary education (ISCED 0-2)	Upper secondary or post-secondary non-tertiary education (ISCED 3-4)	Tertiary education (ISCED 5-8)
DE	0	-1	0	0.00%	-0.12%	0.00%
ES	-154	145	8	-25.93%	38.16%	1.52%
FR	-172	171	1	-49.00%	26.64%	0.20%
IT	-200	174	26	-33.50%	27.10%	9.96%
NL	-126	104	20	-32.90%	17.45%	3.83%
PL	-108	107	0	-54.00%	12.19%	0.00%
SE	-88	134	-48	-28.21%	21.51%	-8.47%
SI	-178	177	0	-75.11%	21.48%	0.00%
UK	-48	29	19	-16.67%	4.81%	3.12%

Table A.8: Quartile definitions, absolute target and sample income distribution per country (S9)

Country	Unequivalized income quartiles (in national currencies)			Target number of respondents in each quartile				Distribution of income levels in the sample per quartile			
	1st top cut-off point (T-1)	2nd top cut-off point (T-2)	3rd top cut-off point (T-3)	1	2	3	4	1	2	3	4
DE	1,749	2,749	3,499	375	375	375	375	375	375	375	375
ES	1,249	1,999	2,499	375	375	375	375	376	375	375	374
FR	1,749	2,499	2,999	375	375	375	375	383	375	369	373
IT	1,249	1,999	2,499	375	375	375	375	380	402	360	358
NL	1,749	2,499	3,249	375	375	375	375	375	375	374	375
PL	2,999	4,999	5,999	375	375	375	375	375	375	375	375
SE	17,499	29,999	42,499	375	375	375	375	375	375	375	375
SI	999	1,749	2,249	375	375	375	375	375	375	375	375
UK	1,649	2,449	3,249	375	375	375	375	387	375	363	375

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Table A.9: Absolute and relative differences between target and sample income distribution (S9)

Country	Absolute differences between target and sample income distribution				Relative differences between target and sample income distribution			
	1	2	3	4	1	2	3	4
DE	0	0	0	0	0.00%	0.00%	0.00%	0.00%
ES	1	0	0	-1	0.27%	0.00%	0.00%	-0.27%
FR	8	0	-6	-2	2,13%	0,00%	-1,60%	-0,53%
IT	5	27	-15	-17	1.33%	7.20%	-4.00%	-4.53%
NL	0	0	-1	0	0,00%	0,00%	-0,27%	0,00%
PL	0	0	0	0	0,00%	0,00%	0,00%	0,00%
SE	0	0	0	0	0.00%	0.00%	0.00%	0.00%
SI	0	0	0	0	0,00%	0,00%	0,00%	0,00%
UK	12	0	-12	0	3.20%	0.00%	-3.20%	0.00%

Table A.10: Frequency distribution: Living areas (S5)

Country	A city	A town or suburb	A rural area
DE	459	602	439
	30.60%	40.13%	29.27%
ES	953	453	94
	63.53%	30.20%	6.27%
FR	328	643	529
	21.87%	42.87%	35.27%
IT	722	612	166
	48.13%	40.80%	11.07%
NL	577	549	373
	38.49%	36.62%	24.88%
PL	639	556	305
	42.60%	37.07%	20.33%
SE	559	641	300
	37.27%	42.73%	20.00%
SI	709	481	310
	47.27%	32.07%	20.67%
UK	410	841	249
	27.33%	56.07%	16.60%
Total	**5,356**	**5,378**	**2,765**
	39.68%	**39.84%**	**20.48%**

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Table A.11: Frequency distribution: Home rented or owned (S10)

Country	I or another household member own the dwelling	I/We rent the dwelling	The dwelling is rent-free but not owned	Other
DE	528	947	20	5
	35.20%	63.13%	1.33%	0.33%
ES	1,084	361	33	22
	72.27%	24.07%	2.20%	1.47%
FR	787	620	42	51
	52.47%	41.33%	2.80%	3.40%
IT	1,047	346	86	21
	69.80%	23.07%	5.73%	1.40%
NL	860	597	34	8
	57.37%	39.83%	2.27%	0.53%
PL	1,109	307	34	50
	73.93%	20.47%	2.27%	3.33%
SE	604	757	24	115
	40.27%	50.47%	1.60%	7.67%
SI	1,099	296	90	15
	73.27%	19.73%	6.00%	1.00%
UK	905	560	22	13
	60.33%	37.33%	1.47%	0.87%
Total	**8,023**	**4,791**	**385**	**300**
	59.43%	**35.49%**	**2.85%**	**2.22%**

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Table A.12: Frequency distribution: Type of building (S11)

Country	Detached home	Semi-detached/ terraced home	Apartment building	Not disclosed
DE	336	205	948	11
	22.40%	13.67%	63.20%	0.73%
ES	327	178	983	12
	21.80%	11.87%	65.53%	0.80%
FR	700	240	553	7
	46.67%	16.00%	36.87%	0.47%
IT	432	126	917	25
	28.80%	8.40%	61.13%	1.67%
NL	244	887	354	14
	16.28%	59.17%	23.62%	0.93%
PL	499	95	896	10
	33.27%	6.33%	59.73%	0.67%
SE	415	146	926	13
	27.67%	9.73%	61.73%	0.87%
SI	796	94	604	6
	53.07%	6.27%	40.27%	0.40%
UK	329	852	301	18
	21.93%	56.80%	20.07%	1.20%
Total	**4,078**	**2,823**	**6,482**	**116**
	30.21%	**20.91%**	**48.02%**	**0.86%**

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Table A.13: Green electricity tariff (S7)

Country	Yes	No	Do not know
DE	470	809	221
	31.33%	53.93%	14.73%
ES	214	955	331
	14.27%	63.67%	22.07%
FR	162	1,093	245
	10.80%	72.87%	16.33%
IT	180	1,080	240
	12.00%	72.00%	16.00%
NL	765	418	316
	51.03%	27.89%	21.08%
PL	315	1,084	101
	21.00%	72.27%	6.73%
SE	390	549	561
	26.00%	36.60%	37.40%
SI	290	950	260
	19.33%	63.33%	17.33%
UK	351	892	257
	23.40%	59.47%	17.13%
Total	**3,137**	**7,830**	**2,532**
	23.24%	**58.00%**	**18.76%**

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Table A.14: Frequency distribution: Solar panels (S12)

Country	Yes	No	Do not know
DE	171	1,301	28
	11.40%	86.73%	1.87%
ES	164	1,314	22
	10.93%	87.60%	1.47%
FR	100	1,393	7
	6.67%	92.87%	0.47%
IT	158	1,331	11
	10.53%	88.73%	0.73%
NL	485	991	23
	32.35%	66.11%	1.53%
PL	185	1,278	37
	12.33%	85.20%	2.47%
SE	122	1,328	50
	8.13%	88.53%	3.33%
SI	109	1,378	13
	7.27%	91.87%	0.87%
UK	152	1,328	20
	10.13%	88.53%	1.33%
Total	**1,646**	**11,642**	**211**
	12.19%	**86.24%**	**1.56%**

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Table A.15: Frequency distribution: Conditions for solar panels (S13)

Country	Yes	No: impossible	No: not decision maker	No: other reason	Do not know	Total
DE	550	89	392	66	232	1,329
	41.38%	6.70%	29.50%	4.97%	17.46%	100.00%
ES	424	204	402	37	269	1,336
	31.74%	15.27%	30.09%	2.77%	20.13%	100.00%
FR	395	182	506	134	183	1,400
	28.21%	13.00%	36.14%	9.57%	13.07%	100.00%
IT	581	148	338	94	181	1,342
	43.29%	11.03%	25.19%	7.00%	13.49%	100.00%
NL	391	125	299	98	101	1,014
	38.56%	12.33%	29.49%	9.66%	9.96%	100.00%
PL	454	201	390	63	207	1,315
	34.52%	15.29%	29.66%	4.79%	15.74%	100.00%
SE	464	120	501	57	236	1,378
	33.67%	8.71%	36.36%	4.14%	17.13%	100.00%
SI	676	123	340	84	168	1,391
	48.60%	8.84%	24.44%	6.04%	12.08%	100.00%
UK	554	133	324	108	229	1,348
	41.10%	9.87%	24.04%	8.01%	16.99%	100.00%
Total	**4,489**	**1,325**	**3,492**	**741**	**1,806**	**11,853**
	37.87%	**11.18%**	**29.46%**	**6.25%**	**15.24%**	**100.00%**

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Table A.16: Frequency distribution: Importance of protecting the environment (AB1)

Country	Not at all important	Not very important	Fairly important	Very important
DE	21	126	822	531
	1.40%	8.40%	54.80%	35.40%
ES	14	69	665	752
	0.93%	4.60%	44.33%	50.13%
FR	17	102	786	595
	1.13%	6.80%	52.40%	39.67%
IT	6	22	451	1,021
	0.40%	1.47%	30.07%	68.07%
NL	33	141	856	469
	2.20%	9.41%	57.10%	31.29%
PL	9	58	690	743
	0.60%	3.87%	46.00%	49.53%
SE	17	75	592	816
	1.13%	5.00%	39.47%	54.40%
SI	4	61	628	807
	0.27%	4.07%	41.87%	53.80%
UK	31	105	690	674
	2.07%	7.00%	46.00%	44.93%
Total	**152**	**759**	**6,180**	**6,408**
	1.13%	**5.62%**	**45.78%**	**47.47%**

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Table A.17: Frequency distribution: Seriousness of climate change as a problem (AB2)

Country	1	2	3	4	5	6	7	8	9	10
DE	49	24	58	60	123	121	207	280	209	369
	3.27%	1.60%	3.87%	4.00%	8.20%	8.07%	13.80%	18.67%	13.93%	24.60%
ES	17	10	20	23	72	81	183	325	290	479
	1.13%	0.67%	1.33%	1.53%	4.80%	5.40%	12.20%	21.67%	19.33%	31.93%
FR	16	7	15	25	109	85	249	389	234	371
	1.07%	0.47%	1.00%	1.67%	7.27%	5.67%	16.60%	25.93%	15.60%	24.73%
IT	10	6	5	5	31	51	101	311	279	701
	0.67%	0.40%	0.33%	0.33%	2.07%	3.40%	6.73%	20.73%	18.60%	46.73%
NL	41	14	32	43	101	166	323	365	203	211
	2.74%	0.93%	2.13%	2.87%	6.74%	11.07%	21.55%	24.35%	13.54%	14.08%
PL	32	13	24	23	72	85	177	237	228	609
	2.13%	0.87%	1.60%	1.53%	4.80%	5.67%	11.80%	15.80%	15.20%	40.60%
SE	49	31	36	46	112	122	232	302	180	390
	3.27%	2.07%	2.40%	3.07%	7.47%	8.13%	15.47%	20.13%	12.00%	26.00%
SI	15	7	15	25	63	62	159	301	242	611
	1.00%	0.47%	1.00%	1.67%	4.20%	4.13%	10.60%	20.07%	16.13%	40.73%
UK	34	18	22	34	81	96	208	317	209	481
	2.27%	1.20%	1.47%	2.27%	5.40%	6.40%	13.87%	21.13%	13.93%	32.07%
Total	**263**	**130**	**227**	**284**	**764**	**869**	**1,839**	**2,827**	**2,074**	**4,222**
	1.95%	**0.96%**	**1.68%**	**2.10%**	**5.66%**	**6.44%**	**13.62%**	**20.94%**	**15.36%**	**31.28%**

Table A.18: Frequency distribution: Agreement with statements regarding the use of renewable energy sources (AB3)

AB3	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
AB3a	1,293	3,026	6,030	2,400	750
	9.58%	22.42%	44.67%	17.78%	5.56%
AB3b	380	537	2,884	5,886	3,812
	2.82%	3.98%	21.36%	43.60%	28.24%
AB3c	321	268	1,744	5,103	6,063
	2.38%	1.99%	12.92%	37.80%	44.91%

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Table A.19: Frequency distribution: Agreement with statements regarding energy efficiency and conservation (AB4)

AB4	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
AB4a	3,986	4,954	2,492	1,472	595
	29.53%	36.70%	18.46%	10.90%	4.41%
AB4b	203	381	1,911	6,589	4,415
	1.50%	2.82%	14.16%	48.81%	32.71%
AB4c	2,255	4,956	3,195	2,298	795
	16.70%	36.71%	23.67%	17.02%	5.89%
AB4d	2,662	4,581	3,659	1,932	665
	19.72%	33.94%	27.11%	14.31%	4.93%
AB4e	203	341	2,770	6,482	3,703
	1.50%	2.53%	20.52%	48.02%	27.43%
AB4f	264	376	2,056	5,566	5,237
	1.96%	2.79%	15.23%	41.23%	38.80%
AB4g	596	1,442	5,060	4,426	1,975
	4.42%	10.68%	37.48%	32.79%	14.63%
AB4h	230	469	3,331	5,643	3,826
	1.70%	3.47%	24.68%	41.80%	28.34%

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Table A.20: Frequency distribution: Opinion on policy measures (AB6)

AB6	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
AB6a	1,453	1,640	4,183	3,595	2,628
	10.76%	12.15%	30.99%	26.63%	19.47%
AB6b	362	737	3,268	4,827	4,305
	2.68%	5.46%	24.21%	35.76%	31.89%
AB6c	335	441	2,522	5,733	4,468
	2.48%	3.27%	18.68%	42.47%	33.10%
AB6d	153	458	4,103	5,758	3,027
	1.13%	3.39%	30.39%	42.66%	22.42%
AB6e	140	238	2,041	6,073	5,007
	1.04%	1.76%	15.12%	44.99%	37.09%
AB6f	868	1,279	3,513	4,854	2,985
	6.43%	9.47%	26.02%	35.96%	22.11%
AB6g	238	626	2,897	5,785	3,953
	1.76%	4.64%	21.46%	42.86%	29.28%

Table A.21: Frequency distribution: Agreement with statements regarding the distribution of energy costs in the country (AB9)

AB9	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
AB9a	849	2,402	3,836	4,364	2,048
	6.29%	17.79%	28.42%	32.33%	15.17%
AB9b	941	1,950	3,641	4,359	2,608
	6.97%	14.45%	26.97%	32.29%	19.32%
AB9c	1,683	3,174	4,969	2,832	841
	12.47%	23.51%	36.81%	20.98%	6.23%
AB9d	1,813	3,537	4,877	2,687	585
	13.43%	26.20%	36.13%	19.91%	4.33%

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Table A.22: Frequency distribution: Opinion on fairness of the distribution of costs in connection with the energy transition in the country (AB8)

Country	Very unfair	Unfair	Neither fair nor unfair	Fair	Very fair	Do not know
DE	266	541	368	150	41	134
	17.73%	36.07%	24.53%	10.00%	2.73%	8.93%
ES	302	426	349	178	74	171
	20.13%	28.40%	23.27%	11.87%	4.93%	11.40%
FR	163	441	378	164	33	321
	10.87%	29.40%	25.20%	10.93%	2.20%	21.40%
IT	165	459	403	162	37	274
	11.00%	30.60%	26.87%	10.80%	2.47%	18.27%
NL	172	359	409	215	84	260
	11.47%	23.95%	27.28%	14.34%	5.60%	17.34%
PL	147	397	491	181	55	229
	9.80%	26.47%	32.73%	12.07%	3.67%	15.27%
SE	131	283	432	219	56	379
	8.73%	18.87%	28.80%	14.60%	3.73%	25.27%
SI	168	404	504	171	36	217
	11.20%	26.93%	33.60%	11.40%	2.40%	14.47%
UK	101	327	373	305	72	322
	6.73%	21.80%	24.87%	20.33%	4.80%	21.47%
Total	**1,615**	**3,637**	**3,707**	**1,745**	**488**	**2,307**
	11.96%	**26.94%**	**27.46%**	**12.93%**	**3.62%**	**17.09%**

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Table A.23: Frequency distribution: Perceived importance of energy policy's fairness for the energy transition's success in the country (AB10)

Country	Not at all important	Hardly important	Neither important nor unimportant	Important	Very important
DE	16	48	330	673	433
	1.07%	3.20%	22.00%	44.87%	28.87%
ES	23	43	343	838	253
	1.53%	2.87%	22.87%	55.87%	16.87%
FR	12	37	489	737	225
	0.80%	2.47%	32.60%	49.13%	15.00%
IT	7	26	242	892	333
	0.47%	1.73%	16.13%	59.47%	22.20%
NL	15	43	357	796	288
	1.00%	2.87%	23.82%	53.10%	19.21%
PL	17	36	251	856	340
	1.13%	2.40%	16.73%	57.07%	22.67%
SE	29	50	429	747	245
	1.93%	3.33%	28.60%	49.80%	16.33%
SI	13	56	262	848	321
	0.87%	3.73%	17.47%	56.53%	21.40%
UK	6	38	316	853	287
	0.40%	2.53%	21.07%	56.87%	19.13%
Total	**138**	**377**	**3,019**	**7,240**	**2,725**
	1.02%	**2.79%**	**22.36%**	**53.63%**	**20.19%**

Table A.24: Frequency distribution: Level of knowledge about the production and use of energy – self-perception (EL1)

EL1	Not at all	Hardly	Roughly	Fairly we	Very well
EL1a	665	2,578	5,794	3,647	815
	4.93%	19.10%	42.92%	27.02%	6.04%
EL1b	719	2,109	4,574	4,324	1,773
	5.33%	15.62%	33.88%	32.03%	13.13%
EL1c	330	1,406	5,173	5,249	1,341
	2.44%	10.42%	38.32%	38.88%	9.93%

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Table A.25: Frequency distribution: Person typically responsible for energy-related decisions in a household (EL7)

Country	Me	Another household member	It varies	Typically a joint decision	Person outside the household
DE	747	143	71	484	55
	49.80%	9.53%	4.73%	32.27%	3.67%
ES	798	177	48	441	36
	53.20%	11.80%	3.20%	29.40%	2.40%
FR	778	122	70	508	22
	51.87%	8.13%	4.67%	33.87%	1.47%
IT	740	272	51	424	13
	49.33%	18.13%	3.40%	28.27%	0.87%
NL	858	132	74	403	32
	57.24%	8.81%	4.94%	26.88%	2.13%
PL	768	154	85	444	49
	51.20%	10.27%	5.67%	29.60%	3.27%
SE	860	153	99	250	138
	57.33%	10.20%	6.60%	16.67%	9.20%
SI	636	216	54	534	60
	42.40%	14.40%	3.60%	35.60%	4.00%
UK	904	216	52	301	27
	60.27%	14.40%	3.47%	20.07%	1.80%
Total	**7,089**	**1,585**	**604**	**3,789**	**432**
	52.52%	**11.74%**	**4.47%**	**28.07%**	**3.20%**

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Table A.26: Frequency distribution: Gender of person typically responsible for energy-related decisions in a household, if it is typically just one person (EL8)

Country	Male	Female	Non-binary	Not disclosed	Total
DE	113	27	0	3	143
	79.02%	18.88%	0.00%	2.10%	100.00%
ES	109	63	4	1	177
	61.58%	35.59%	2.26%	0.56%	100.00%
FR	78	44	0	0	122
	63.93%	36.07%	0.00%	0.00%	100.00%
IT	187	78	2	5	272
	68.75%	28.68%	0.74%	1.84%	100.00%
NL	81	45	4	2	132
	61.36%	34.09%	3.03%	1.52%	100.00%
PL	88	65	0	1	154
	57.14%	42.21%	0.00%	0.65%	100.00%
SE	104	44	1	4	153
	67.97%	28.76%	0.65%	2.61%	100.00%
SI	155	58	3	0	216
	71.76%	26.85%	1.39%	0.00%	100.00%
UK	139	77	0	0	216
	64.35%	35.65%	0.00%	0.00%	100.00%
Total	**1,054**	**501**	**14**	**16**	**1,585**
	66.50%	**31.61%**	**0.88%**	**1.01%**	**100.00%**

Table A.27: Frequency distribution: Gender of person typically responsible for energy-related decisions in a typical household (EL9)

EL9	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	More than one household member
1 (Male)	609	1,062	2,164	1,715	560	645
	9.02%	15.72%	32.04%	25.39%	8.29%	9.55%
2 (Female)	493	1,564	2,614	771	339	963
	7.31%	23.19%	38.76%	11.43%	5.03%	14.28%
Total	**1,102**	**2,626**	**4,778**	**2,486**	**899**	**1,608**
	8.16%	**19.45%**	**35.40%**	**18.42%**	**6.66%**	**11.91%**

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Table A.28: Frequency distribution: Awareness of energy communities (AW1)

Country	Yes	No	Not sure
DE	188	1,108	204
	12.53%	73.87%	13.60%
ES	224	1,086	190
	14.93%	72.40%	12.67%
FR	136	1,187	177
	9.07%	79.13%	11.80%
IT	190	1,100	210
	12.67%	73.33%	14.00%
NL	439	828	232
	29.29%	55.24%	15.48%
PL	276	909	315
	18.40%	60.60%	21.00%
SE	233	972	295
	15.53%	64.80%	19.67%
SI	254	977	269
	16.93%	65.13%	17.93%
UK	220	1,135	145
	14.67%	75.67%	9.67%
Total	**2,160**	**9,302**	**2,037**
	16.00%	**68.91%**	**15.09%**

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Table A.29: Frequency distribution: Perceived importance of energy communities for transition towards sustainable energy system (AW3)

Country	Not at all important	Not important	Neither important nor unimportant	Important	Very important	Do not know	Total
DE	0	4	19	84	80	1	188
	0.00%	2.13%	10.11%	44.68%	42.55%	0.53%	100.00%
ES	3	8	23	97	93	0	224
	1.34%	3.57%	10.27%	43.30%	41.52%	0.00%	100.00%
FR	1	2	21	63	47	2	136
	0.74%	1.47%	15.44%	46.32%	34.56%	1.47%	100.00%
IT	0	4	8	66	111	1	190
	0.00%	2.11%	4.21%	34.74%	58.42%	0.53%	100.00%
NL	8	13	57	245	106	10	439
	1.82%	2.96%	12.98%	55.81%	24.15%	2.28%	100.00%
PL	1	4	28	124	118	1	276
	0.36%	1.45%	10.14%	44.93%	42.75%	0.36%	100.00%
SE	4	7	40	99	77	6	233
	1.72%	3.00%	17.17%	42.49%	33.05%	2.58%	100.00%
SI	1	4	12	118	117	2	254
	0.39%	1.57%	4.72%	46.46%	46.06%	0.79%	100.00%
UK	2	3	18	82	115	0	220
	0.91%	1.36%	8.18%	37.27%	52.27%	0.00%	100.00%
Total	**20**	**49**	**226**	**978**	**864**	**23**	**2,160**
	0.93%	**2.27%**	**10.46%**	**45.28%**	**40.00%**	**1.06%**	**100.00%**

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Table A.30: Frequency distribution: Perceived benefits of energy communities (PB1)

PB1	Not at all important	Slightly important	Quite important	Very important
PB1a	298	1,342	5,173	6,686
	2.21%	9.94%	38.32%	49.53%
PB1b	1,257	4,146	5,462	2,634
	9.31%	30.71%	40.46%	19.51%
PB1c	532	2,014	5,395	5,558
	3.94%	14.92%	39.97%	41.17%
PB1d	1,510	3,924	5,796	2,269
	11.19%	29.07%	42.94%	16.81%
PB1e	1,309	3,325	5,337	3,528
	9.70%	24.63%	39.54%	26.14%
PB1f	991	3,247	6,151	3,110
	7.34%	24.05%	45.57%	23.04%
PB1g	799	2,908	5,782	4,010
	5.92%	21.54%	42.83%	29.71%
PB1h	507	2,290	6,653	4,049
	3.76%	16.96%	49.29%	29.99%
PB1i	594	2,494	6,568	3,843
	4.40%	18.48%	48.66%	28.47%

Table A.31: Reduction of electricity costs split (PB1a)

EC_member	Not at all important	Slightly important	Quite important	Very important	Total
Not EC member	283	1,281	4,987	6,450	**13,001**
	2.18%	9.85%	38.36%	49.61%	**100.00%**
EC member	15	61	186	236	**498**
	3.01%	12.25%	37.35%	47.39%	**100.00%**
Total	**298**	**1,342**	**5,173**	**6,686**	**13,499**
	2.21%	**9.94%**	**38.32%**	**49.53%**	**100.00%**

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Table A.32: Invest and earn money split (PB1b)

EC_member	Not at all important	Slightly important	Quite important	Very important	Total
Not EC member	1,232	4,045	5,271	2,453	13,001
	9.48%	31.11%	40.54%	18.87%	100.00%
EC member	25	101	191	181	498
	5.02%	20.28%	38.35%	36.35%	100.00%
Total	**1,257**	**4,146**	**5,462**	**2,634**	**13,499**
	9.31%	**30.71%**	**40.46%**	**19.51%**	**100.00%**

Table A.33: Reduce fossil fuel consumption split (PB1c)

EC_member	Not at all important	Slightly important	Quite important	Very important	Total
Not EC member	511	1,948	5,220	5,322	13,001
	3.93%	14.98%	40.15%	40.94%	100.00%
EC member	21	66	175	236	498
	4.22%	13.25%	35.14%	47.39%	100.00%
Total	**532**	**2,014**	**5,395**	**5,558**	**13,499**
	3.94%	**14.92%**	**39.97%**	**41.17%**	**100.00%**

Table A.34: Do things together split (PB1d)

EC_member	Not at all important	Slightly important	Quite important	Very important	Total
Not EC member	1,486	3,850	5,589	2,076	13,001
	11.43%	29.61%	42.99%	15.97%	100.00%
EC member	24	74	207	193	498
	4.82%	14.86%	41.57%	38.76%	100.00%
Total	**1,510**	**3,924**	**5,796**	**2,269**	**13,499**
	11.19%	**29.07%**	**42.94%**	**16.81%**	**100.00**

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Table A.35: Part of movement addressing climate change split (PB1e)

EC_member	Not at all important	Slightly important	Quite important	Very important	Total
Not EC member	1,287	3,260	5,135	3,319	13,001
	9.90%	25.07%	39.50%	25.53%	100.00%
EC member	22	65	202	209	498
	4.42%	13.05%	40.56%	41.97%	100.00%
Total	**1,309**	**3,325**	**5,337**	**3,528**	**13,499**
	9.70%	**24.63%**	**39.54%**	**26.14%**	**100.00%**

Table A.36: Engage in new technologies split (PB1f)

EC_member	Not at all important	Slightly important	Quite important	Very important	Total
Not EC member	966	3,179	5,953	2,903	13,001
	7.43%	24.45%	45.79%	22.33%	100.00%
EC member	25	68	198	207	498
	5.02%	13.65%	39.76%	41.57%	100.00%
Total	**991**	**3,247**	**6,151**	**3,110**	**13,499**
	7.34%	**24.05%**	**45.57%**	**23.04%**	**100.00%**

Table A.37: Being independent split (PB1g)

EC_member	Not at all important	Slightly important	Quite important	Very important	Total
Not EC member	778	2,818	5,587	3,818	13,001
	5.98%	21.68%	42.97%	29.37%	100.00%
EC member	21	90	195	192	498
	4.22%	18.07%	39.16%	38.55%	100.00%
Total	**799**	**2,908**	**5,782**	**4,010**	**13,499**
	5.92%	**21.54%**	**42.83%**	**29.71%**	**100.00%**

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Table A.38: Own energy security split (PB1h)

EC_member	Not at all important	Slightly important	Quite important	Very important	Total
Not EC member	489	2,227	6,456	3,829	13,001
	3.76%	17.13%	49.66%	29.45%	100.00%
EC member	18	63	197	220	498
	3.61%	12.65%	39.56%	44.18%	100.00%
Total	**507**	**2,290**	**6,653**	**4,049**	**13,499**
	3.76%	**16.96%**	**49.29%**	**29.99%**	**100.00%**

Table A.39: Fairer energy transition split (PB1i)

EC_member	Not at all important	Slightly important	Quite important	Very important	Total
Not EC member	571	2,427	6,377	3,626	13,001
	4.39%	18.67%	49.05%	27.89%	100.00%
EC member	23	67	191	217	498
	4.62%	13.45%	38.35%	43.57%	100.00%
Total	**594**	**2,494**	**6,568**	**3,843**	**13,499**
	4.40%	**18.48%**	**48.66%**	**28.47%**	**100.00%**

Table A.40: Frequency distribution: Clarity/understanding of benefits of an energy community (DB4)

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1,062	2,221	5,847	3,637	732
7.87%	16.45%	43.31%	26.94%	5.42%

Table A.41: Frequency distribution: Perception of energy communities (DB5)

DB5	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Do not know
DB5a	364	1,520	3,605	4,626	2,107	1,277
	2.70%	11.26%	26.71%	34.27%	15.61%	9.46%
DB5b	155	191	1,723	5,805	4,886	739
	1.15%	1.41%	12.76%	43.00%	36.20%	5.47%
DB5c	328	1,070	3,061	5,269	2,869	902
	2.43%	7.93%	22.68%	39.03%	21.25%	6.68%

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Table A.42: Frequency distribution: Main motivation of partaking in an energy community (DB6a)

DB6a	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Do not know
DB6a_1	244	510	2,290	5,889	3,778	788
	1.81%	3.78%	16.96%	43.63%	27.99%	5.84%
DB6a_2	593	1,395	4,116	4,798	1,712	885
	4.39%	10.33%	30.49%	35.54%	12.68%	6.56%
DB6a_3	275	314	1,770	5,475	5,003	662
	2.04%	2.33%	13.11%	40.56%	37.06%	4.90%

Table A.43: Economic benefit split (DB6a_1)

EC_ member	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	I do not know	Total
Not EC member	237	482	2,228	5,691	3,577	786	13,001
	1.82%	3.71%	17.14%	43.77%	27.51%	6.05%	100.00%
EC member	7	28	62	198	201	2	498
	1.41%	5.62%	12.45%	39.76%	40.36%	0.40%	100.00%
Total	**244**	**510**	**2,290**	**5,889**	**3,778**	**788**	**13,499**
	1.81%	**3.78%**	**16.96%**	**43.63%**	**27.99%**	**5.84%**	**100.00%**

Table A.44: Social aspect split (DB6a_2)

EC_ member	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	I do not know	Total
Not EC member	579	1,369	4,031	4,601	1,544	877	13,001
	4.45%	10.53%	31.01%	35.39%	11.88%	6.75%	100.00%
EC member	14	26	85	197	168	8	498
	2.81%	5.22%	17.07%	39.56%	33.73%	1.61%	100.00%
Total	**593**	**1,395**	**4,116**	**4,798**	**1,712**	**885**	**13,499**
	4.39%	**10.33%**	**30.49%**	**35.54%**	**12.68%**	**6.56%**	**100.00%**

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Table A.45: Environmental benefit split (DB6a_3)

EC_ member	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	I do not know	Total
Not EC member	265	296	1,717	5,314	4,751	658	13,001
	2.04%	2.28%	13.21%	40.87%	36.54%	5.06%	100.00%
EC member	10	18	53	161	252	4	498
	2.01%	3.61%	10.64%	32.33%	50.60%	0.80%	100.00%
Total	**275**	**314**	**1,770**	**5,475**	**5,003**	**662**	**13,499**
	2.04%	**2.33%**	**13.11%**	**40.56%**	**37.06%**	**4.90%**	**100.00%**

Table A.46: Frequency distribution: Percentage of households who already have a variable energy pricing tariff (DR1)

Country	Yes	No	Do not know	Total
DE	41	607	86	734
	5.59%	82.70%	11.72%	100.00%
ES	363	293	97	753
	48.21%	38.91%	12.88%	100.00%
FR	363	302	84	749
	48.46%	40.32%	11.21%	100.00%
IT	298	342	118	758
	39.31%	45.12%	15.57%	100.00%
NL	288	346	117	751
	38.35%	46.07%	15.58%	100.00%
PL	154	499	99	752
	20.48%	66.36%	13.16%	100.00%
SE	70	467	214	751
	9.32%	62.18%	28.50%	100.00%
SI	463	222	76	761
	60.84%	29.17%	9.99%	100.00%
UK	106	491	170	767
	13.82%	64.02%	22.16%	100.00%
Total	**2,146**	**3,569**	**1,061**	**6,776**
	31.67%	**52.67%**	**15.66%**	**100.00%**

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Table A. 47: Frequency distribution: Respondents who donated money in previous year (PS1)

Country	Yes	No	Not disclosed	Do not know
DE	706	730	46	18
	47.07%	48.67%	3.07%	1.20%
ES	517	875	77	31
	34.47%	58.33%	5.13%	2.07%
FR	518	874	48	60
	34.53%	58.27%	3.20%	4.00%
IT	604	780	75	41
	40.27%	52.00%	5.00%	2.73%
NL	851	542	56	50
	56.77%	36.16%	3.74%	3.34%
PL	872	505	49	74
	58.13%	33.67%	3.27%	4.93%
SE	705	661	51	83
	47.00%	44.07%	3.40%	5.53%
SI	883	500	63	54
	58.87%	33.33%	4.20%	3.60%
UK	900	507	44	49
	60.00%	33.80%	2.93%	3.27%
Total	**6,556**	**5,974**	**509**	**460**
	48.57%	**44.26%**	**3.77%**	**3.41%**

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Table A.48: Frequency distribution: Trust in other people (PC2)

Country	Take advantage	Fair
DE	857	643
	57.13%	42.87%
ES	889	611
	59.27%	40.73%
FR	930	570
	62.00%	38.00%
IT	1,032	468
	68.80%	31.20%
NL	656	843
	43.76%	56.24%
PL	1,002	498
	66.80%	33.20%
SE	716	784
	47.73%	52.27%
SI	940	560
	62.67%	37.33%
UK	799	701
	53.27%	46.73%
Total	**7,821**	**5,678**
	57.94%	**42.06%**

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Table A.49: Altruism of other people (PC3)

Country	Helpful	Only own interests
DE	362	1,138
	24.13%	75.87%
ES	603	897
	40.20%	59.80%
FR	328	1,172
	21.87%	78.13%
IT	419	1,081
	27.93%	72.07%
NL	696	803
	46.43%	53.57%
PL	468	1,032
	31.20%	68.80%
SE	807	693
	53.80%	46.20%
SI	404	1,096
	26.93%	73.07%
UK	828	672
	55.20%	44.80%
Total	**4,915**	**8,584**
	36.41%	**63.59%**

Table A.50: Frequency distribution: Inclusion of others in self (PC6)

PC6	1	2	3	4	5	6	7
PC6a	570	407	540	1,100	1,646	2,740	6,496
	4.22%	3.02%	4.00%	8.15%	12.19%	20.30%	48.12%
PC6b	674	644	1,013	1,959	3,363	3,358	2,488
	4.99%	4.77%	7.50%	14.51%	24.91%	24.88%	18.43%
PC6c	6,233	2,898	1,744	1,303	762	300	259
	46.17%	21.47%	12.92%	9.65%	5.64%	2.22%	1.92%
PC6d	2,201	3,167	2,873	2,733	1,643	580	302
	16.30%	23.46%	21.28%	20.25%	12.17%	4.30%	2.24%
PC6e	509	469	744	1,384	2,344	3,293	4,756
	3.77%	3.47%	5.51%	10.25%	17.36%	24.39%	35.23%

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Table A.51: Frequency distribution: Individualism/collectivism (PC4)

PC4	Do not agree at all	2	3	4	5	6	7	8	Do fully agree
PC4a	172	133	263	390	1,444	1,441	2,668	2,704	4,284
	1.27%	0.99%	1.95%	2.89%	10.70%	10.67%	19.76%	20.03%	31.74%
PC4b	226	200	455	625	1,857	1,881	2,841	2,476	2,938
	1.67%	1.48%	3.37%	4.63%	13.76%	13.93%	21.05%	18.34%	21.76%
PC4c	133	134	308	447	1,696	1,935	3,148	2,599	3,099
	0.99%	0.99%	2.28%	3.31%	12.56%	14.33%	23.32%	19.25%	22.96%
PC4d	149	101	219	363	1,601	1,631	2,912	2,707	3,816
	1.10%	0.75%	1.62%	2.69%	11.86%	12.08%	21.57%	20.05%	28.27%
PC4e	359	122	205	335	1,716	1,525	2,637	2,650	3,950
	2.66%	0.90%	1.52%	2.48%	12.71%	11.30%	19.53%	19.63%	29.26%
PC4f	285	130	198	346	1,672	1,807	3,200	2,726	3,135
	2.11%	0.96%	1.47%	2.56%	12.39%	13.39%	23.71%	20.19%	23.22%
PC4g	335	216	461	560	1,991	2,025	3,058	2,329	2,524
	2.48%	1.60%	3.42%	4.15%	14.75%	15.00%	22.65%	17.25%	18.70%
PC4h	231	146	304	502	1,737	1,891	3,182	2,648	2,858
	1.71%	1.08%	2.25%	3.72%	12.87%	14.01%	23.57%	19.62%	21.17%

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Table A.52: Frequency distribution: Long-term orientation (PC5)

PC5	Do not agree at all	2	3	4	5	6	Do fully agree
PC5a	453	550	797	2,219	2,982	3,065	3,433
	3.36%	4.07%	5.90%	16.44%	22.09%	22.71%	25.43%
PC5b	502	504	968	2,442	3,505	2,965	2,613
	3.72%	3.73%	7.17%	18.09	25.96	21.96	19.36
PC5c	763	591	977	2,188	2,869	2,846	3,265
	5.65	4.38	7.24	16.21	21.25	21.08	24.19
PC5d	698	700	1,307	2,818	3,081	2,545	2,350
	5.17%	5.19%	9.68%	20.88%	22.82%	18.85%	17.41
PC5e	569	428	811	2,462	3,207	2,979	3,043
	4.22%	3.17%	6.01%	18.24%	23.76%	22.07%	22.54%
PC5f	707	618	1,137	2,869	3,078	2,589	2,501
	5.24%	4.58%	8.42%	21.25%	22.80%	19.18%	18.53%
PC5g	506	613	861	2,146	2,877	3,043	3,453
	3.75%	4.54%	6.38%	15.90%	21.31%	22.54%	25.58%
PC5h	112	114	380	1,764	3,280	3,845	4,004
	0.83%	0.84%	2.82%	13.07%	24.30%	28.48%	29.66%

Table A.53: Frequency distribution: Locus of control (PC7)

PC7	Do not agree at all	2	3	4	5	6	Do fully agree
PC7a	1,530	2,129	2,347	3,174	2,369	1,190	760
	11.33%	15.77%	17.39%	23.51%	17.55%	8.82%	5.63%
PC7b	1,669	1,892	1,846	2,778	2,359	1,537	1,418
	12.36%	14.02%	13.68%	20.58%	17.48%	11.39%	10.50%
PC7c	1,709	2,105	2,151	2,977	2,397	1,253	907
	12.66%	15.59%	15.93%	22.05%	17.76%	9.28%	6.72%
PC7d	1,687	2,162	1,866	2,698	2,442	1,462	1,182
	12.50%	16.02%	13.82%	19.99%	18.09%	10.83%	8.76%
PC7e	1,723	1,753	1,676	2,849	2,627	1,541	1,330
	12.76%	12.99%	12.42%	21.11%	19.46%	11.42%	9.85%
PC7f	322	410	737	2,340	3,687	3,270	2,733
	2.39%	3.04%	5.46%	17.33%	27.31%	24.22%	20.25%
PC7g	556	692	1,169	2,947	3,701	2,684	1,750
	4.12%	5.13%	8.66%	21.83%	27.42%	19.88%	12.96%

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FULL QUESTIONNAIRE

See supplementary materials.

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