CLIMATE CAMPAIGNERS

Comprehensive Mapping of Individual Behaviour to Anthropogenic GHG Emissions

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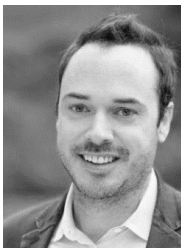

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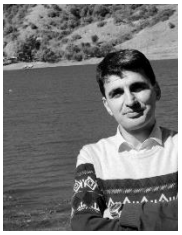

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1. Executive Summary

This deliverable report "D1.1 Comprehensive mapping of individual behaviour to anthropogenic Greenhouse Gas Emissions" provides a re-assessment of the database of the ECHOES survey. This assessment is extended for the partner countries that are not included in the ECHOES database (Peru, South Africa, and Azerbaijan) through data obtained from similar national studies or reports. The ECHOES survey provides one of the most extensive multi-national datasets on lifestyles, containing data on climate-related and energy-related habits and decisions from 18,000 individuals from 31 European countries in the H2020 project ECHOES. The ECHOES survey provides insights into climate-related and energy-related behaviours, decisions, and lifestyles of citizens.

This analysis is conducted at both the country and city level. Accordingly, it includes a country level comparison of results, a city level comparison of results, and a comparison between country-level and city-level results. The city and country level analysis also include interim conclusions and policy suggestions for the particular countries and cities, providing evidence on the lifestyles, lifestyle choices, and behaviours of citizens in the partner countries/cities, which will aid in establishing the relationship between the characteristics and living conditions of citizens and their carbon emitting behaviours.

Outputs of this assessment are used to highlight the lifestyle choices, climate-related and energy-related decisions and behaviours of citizens that impact carbon emitting-behaviours, hence, climate-friendly or climate-harming lifestyles. This enables the identification of possible co-benefits of climate-friendly lifestyle choices and behaviours, along with key factors, motivators, and barriers. Moreover, suggestions for deriving and implementing targeted and impactful policies are also provided.

This ability to identify the relationship between the characteristics of citizens and their carbon emitting behaviours is the result of an extensive set of demographic, cultural, socioeconomic, and other features, which can be used as inputs in designing climate policies and relevant actions. The analysis can also be utilized to reveal potential motivators and barriers that can further be exploited to identify drivers for behavioural change towards achieving low-carbon lifestyles.

These results are then matched with the findings from the literature to provide a more unified perspective regarding the relationship between the characteristics of citizens and their carbon emitting behaviours, demographic, cultural, socioeconomic, or other types of features that can be used as ingredients in designing climate policies and relevant actions.

2. Introduction and Overview

Task 1.1 of CAMPAIGNers analyses the lifestyles, lifestyle choices, and behaviours of citizens in the partner countries/cities, based on evidence from the database of the ECHOES survey and similar existing data for partner countries/ cities not covered by the ECHOES survey (i.e., Azerbaijan (Baku), Peru, and South Africa (Cape Town)). The primary aim of this analysis is to establish the relationship between citizens' characteristics and living conditions, and their carbon emitting behaviours. The results of such analysis have two purposes: to derive and implement targeted and impactful policies, and to identify the possible co-benefits of climate-friendly lifestyle choices and behaviours. The latter also serves to pinpoint and avoid the potential adverse effects of unintended consequences pertaining to such choices and behaviours for vulnerable groups. The importance of such considerations is further emphasized by the understanding that climate policies are more likely to be accepted when the preferences of citizens and co-benefits are incorporated in the policy design phase.

As a Horizon 2020 project, ECHOES (Energy CHOices supporting the Energy union and the Set-plan) aimed to reveal the "policy potential of an integrated social science perspective", touching upon particular areas, such as socio-cultural, socio-economic, socio-political, and gender issues which have an influence on "individual and collective energy choices and social acceptance of the energy transition in Europe" (ECHOES, 2016). To this end, the overarching framework of ECHOES was to foster the implementation of the European Strategic Energy Technology Plan (SET-Plan) and accelerate the Energy Transition, besides contributing to the decarbonisation goals of the future energy system of the European Union.

The ECHOES project covered three technological foci, and three perspectives on energy collectives that were the centre of all research activities included in the project. The technological foci of ECHOES were (a) smart energy technologies, (b) electric mobility, and (c) buildings. The three perspectives pertaining to energy collectives were "(1) individual decision-making as part of collectives (micro), (2) collectives constituting energy cultures and life-styles (meso), and (3) formal social units (macro)" (Similä and Koljonen, 2017).

One of the significant pillars of the ECHOES project was to present a more systematic view regarding energy related decisions and individual behavioural choices. Therefore, ECHOES collected individual data to enable inferences on an impact-based energy lifestyle. The ECHOES survey was conducted in 31 countries (EU-27, United Kingdom, Norway, Switzerland, and Turkey) with a total of 18,000 respondents. The survey contained 114 questions regarding the citizens' climate-related and energy-related decisions and behaviours in fields such as mobility, heating, nutrition, and clothing. In addition to the climate-related and energy-related questions, the ECHOES survey also involved questions pertaining to demographic and socio-economic variables such as age, family composition, education, income, environment-related perspectives, and attitude towards energy and environment policies.

An assessment of the ECHOES Database provides pointers to the lifestyles, climate-related and energy-related decisions and behaviours of citizens that impact carbon emitting-behaviours, hence, climate-friendly or climate-harming lifestyles. To this end, Deliverable 1.1 of CAMPAIGNers provides an assessment of citizens' climate-related and energy-related behaviours, decisions, and lifestyles, as evidenced by the ECHOES survey. This analysis is extended for the partner countries not included in the ECHOES database (Peru, South Africa, and Azerbaijan) through data obtained from similar national studies or reports.

This identification of the relationship between the characteristics of citizens and their carbon emitting behaviours will then lead to a definition of an extensive set of demographic, cultural, socioeconomic, and other features for use as input in designing climate policies and relevant actions. The analysis can also be utilized to reveal

potential motivators and barriers that can further be exploited to identify drivers for behavioural change towards achieving low-carbon lifestyles.

3. Methodology

The ECHOES survey was implemented in 31 countries (EU-27, United Kingdom, Norway, Switzerland, and Turkey) with a total of 18,000 respondents during a 4-month period. Approximately 600 respondents were recruited in each country. The selection method was based on a random sampling procedure to reduce research bias. The International Survey is inherently multi-dimensional and comprehensive, since it combines data pertaining to individuals' energy related behaviours, attitudes and choices with their socio-demographic characteristics, economic and financial profiles, and energy and resource consumption and mobility patterns. It also measures social identity and emotional drivers of energy decisions. In the broader sense, the survey aimed at providing insights into individuals' energy-related choices within the energy transition context. The dataset for the survey is available at the Zenodo platform[1].

For establishing D1.1, the analysis of the database of the ECHOES survey is of central importance. This deliverable report mainly utilizes the analysis from the ECHOES survey on the country and city levels, as well as from similar studies for countries that are not within the scope of the ECHOES survey.

For a number of Lighthouse Cities, the number of respondents in the ECHOES survey is not sufficient to perform a representative city-level analysis. Therefore, for such Lighthouse Cities (Grenoble-France, and Malmö-Sweden), the analysis is performed on the country-level. A similar approach was taken for Dafni and Skopelos (Greece), where some evidence from the cities were still included. Likewise, for Freistadt and Linz (Austria) with a low number of respondents, the analysis was performed to provide a comparison of the country sample and the collection of cities excluding Vienna.

For countries not involved in the ECHOES survey (Baku-Azerbaijan, Cape Town-South Africa, and Trujillo-Peru), similar studies on the city, region, or country level were utilized.

In the ECHOES International Survey, most of the 114 questions used 5-point Likert scales. Also, context-specific scales and multiple answer scales were used. For establishing D1.1, the analysis of the database of the ECHOES survey is of central importance. Hence the following methodology was implemented for D1.1:

- Step 1. Identification of question types in the ECHOES survey
- Step 2. Identification of themes, subthemes, and focal areas
- Step 3. Matching of each question with the question types, themes, subthemes and focal areas
- Step 4. Preparing guidelines for the country/city assessment reports
- Step 5. Synthesis of the assessment reports

[1] See https://zenodo.org/record/3524917#.YQJ82I4zYUE to reach ECHOES database.

This methodological framework for D1.1 is also depicted in Figure 3.1.

In what follows, these steps are defined in more detail:

Step 1. Identification of question types in the ECHOES survey

The 114 questions in the ECHOES survey were analysed from relevant perspectives, such as climate change, lifestyles, and related behaviour. Accordingly, the following question types were identified:

- Demographics questions
- Climate change related questions
- Energy behaviour/attitude related questions
- Lifestyle related questions
- Energy investment related questions

The questions according to types are depicted in the Appendix.

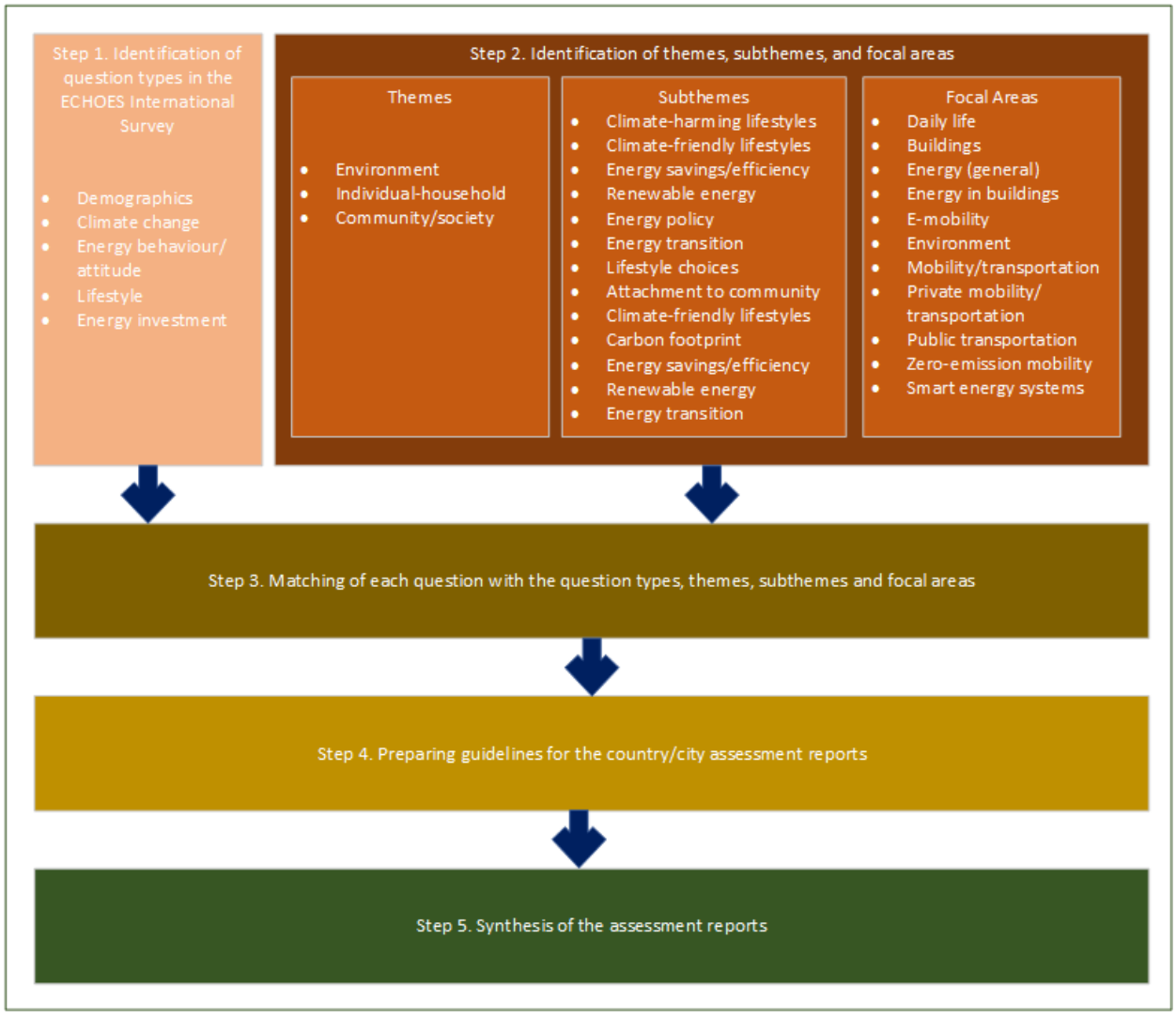


Figure ME1: Methodological Framework for D1.1.

Step 2. Identification of subthemes, contexts, and focal areas

In this step, the questions and question types in the ECHOES Database are further analysed to identify a set of common subthemes, contexts, and focal areas. Neither the demographics questions, nor the energy investment related category, with only one question, were assigned subthemes, contexts or focal areas.

For the questions related to Climate change, energy behaviour, and lifestyle, the identified themes and subthemes are depicted in the following tables:

Table ME1: Themes according to question types

Question Type	Themes
Climate Change Related	Environment
	Individual-household
	Community/society
Energy behaviour/attitude related	Environment
	Individual-household
	Community/society
Lifestyle Related Questions	Individual-household
	Community/society

Similarly, the subthemes are determined as:

Table ME2: Sub Themes according to question types

Question Type	Sub Themes
Climate Change Related	Climate-harming lifestyles
	Climate-friendly lifestyles
Energy behaviour/attitude related	Energy savings/efficiency
	Renewable energy
	Energy policy
	Energy transition
Lifestyle Related Questions	Lifestyle choices
	Attachment to community
	Climate-friendly lifestyles
	Carbon footprint
	Energy savings/efficiency
	Renewable energy
	Energy transition

The lifestyle related questions are of higher importance for D1.1 since the deliverable aims primarily at providing assessment of citizens' lifestyles of concerning their climate-related and energy-related behaviours and decisions. Moreover, the number of questions in this category is considerably higher than the climate change related questions and energy behaviour/attitude related questions. Therefore, the methodology of this deliverable involves a further level of analysis of lifestyle-related questions in the ECHOES survey, that is, the level of focal areas. Accordingly, the focal areas for the lifestyle-related questions are determined as follows:

Table ME3: Focal areas for lifestyle-related questions

Question Type	Focal Areas
Lifestyle Related Questions	Daily life
	Buildings
	Energy (general)
	Energy in buildings
	E-mobility
	Environment
	Mobility/transportation
	Private mobility/transportation
	Public transportation
	Zero-emission mobility
	Smart energy systems

Step 3. Matching of each question with the question types, subthemes, contexts, and focal areas

In this step, the questions in the ECHOES survey are aligned with the sub themes and contexts. For lifestyle related questions, the focal areas were also determined. The resulting matching can be seen in the Appendix.

Step 4. Preparing guidelines for the country/city assessment reports

In order to achieve a comparable and standardized workflow, an outline for the

country/city assessment reports was prepared. The subsections in the outline were defined as follows:

- General info about respondents, cities, etc.
- Demographics
- Country-level analysis, city-level analysis, comparative analysis of cities
    - Assessment of climate change-related results with respect to themes and subthemes
    - Assessment of energy behaviour/attitude related results with respect to themes and subthemes
    - Assessment of lifestyle-related results with respect to themes, subthemes, and focal areas
- Interim Conclusion and Suggestions (co-benefits of climate-friendly behaviours, targeted impactful policy suggestions)

In the cases where the particular partner city has a sufficient and representative number of respondents in the ECHOES survey (i.e., at least 10 percent of the respondents from the particular country), a city-level analysis was sought. Additionally, comparative analyses of the cities were conducted where possible. Where there is an insufficient number of respondents from a particular city in the ECHOES survey, it was decided that the assessment was to be performed at the country level. Also, it was encouraged to use existing surveys/reports that contain similar variables and scope with the ECHOES database to support and complement the analysis, especially at the city level. Since the ECHOES survey covers only European countries, a similar analysis was requested from the remaining partners (Peru, South Africa, and Azerbaijan).

Step 5. Synthesis of the assessment reports

In this step, the assessments from partners were collected and integrated. The assessment reports prepared by South Africa and Peru followed a different methodology, therefore, their structure is slightly different. The analysis in this step involves the identification of similarities and differences between countries/cities in terms of climate-related and energy-related behaviours, decisions, and lifestyles of citizens.

4. Country and City Level Analysis

4.1 Country and City Level Assessments

4.1.1 Austria with a focus on Freistadt and Linz

4.1.1.1 Demographics

The ECHOES database includes 604 respondents from Austria, from all nine federal states. As Table AT1 shows, most respondents are from the capital Vienna (130), followed by Lower Austria (96) and Styria (88). 78 respondents are from Upper Austria, 18 from its state capital Linz and 2 from Freistadt. Since the number of respondents from Freistadt and Linz is not sufficient for a city-level analysis, the country level analysis is presented, and compared the results from 474 respondents, excluding Vienna. This is due to Vienna's distinct characteristics, such as a unique modal split among Austrian cities.

Of all respondents from Austria, 53.5% are male and 54.3% live in urban areas, namely a town or city with more than 10 000 inhabitants. For the part of Austria excluding Vienna, this rate is at a lower 42.2%. For both samples of Austria, the largest group of respondents are between 18 and 34 years old (33%-35%), and approximately 20% fall in each of the remaining three age categories (see Figure AT1).

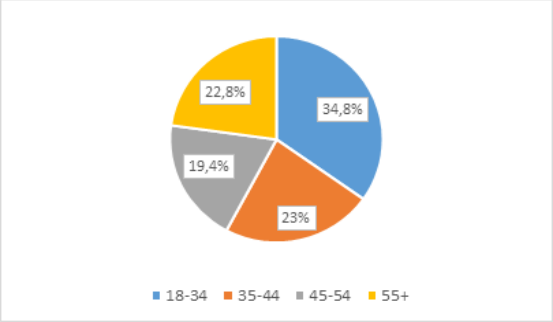


Figure AT1: Respondents by age

65.6% of the respondents are employed, around 11% are retired, 9%, students and 7%, unemployed. As indicated in Figure AT2, educational attainments in the sample are relatively high with 18% tertiary education, 31% A-levels (qualification for university), and 37% with a professional training in practical skills, and only 12% attained up to secondary education. The results from the sample of Austria that excludes Vienna is very similar.

Figure AT3 shows how respondents place themselves on a subjective social ladder, with 1 indicating the lowest level and, relatively speaking, the least wealthy, and 5, the highest level and wealthiest. While the vast majority (54%) place themselves in the middle, in total, 83% place themselves in the middle or higher, and only 4%

feel they are socially at the lowest level in society. All in all, the sample presents a relatively young, well-educated group from cities as well as less populated areas with a solid self-perceived social standing.

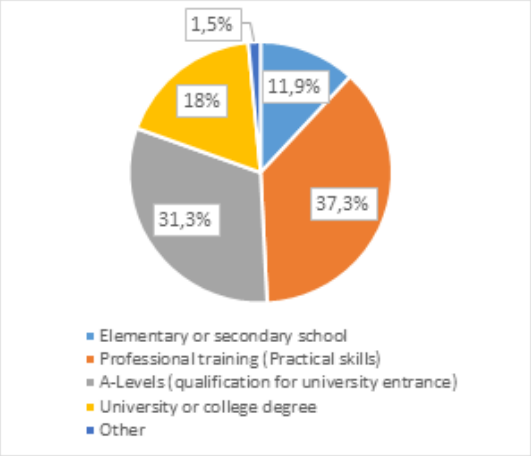


Figure AT2: Respondents by education level

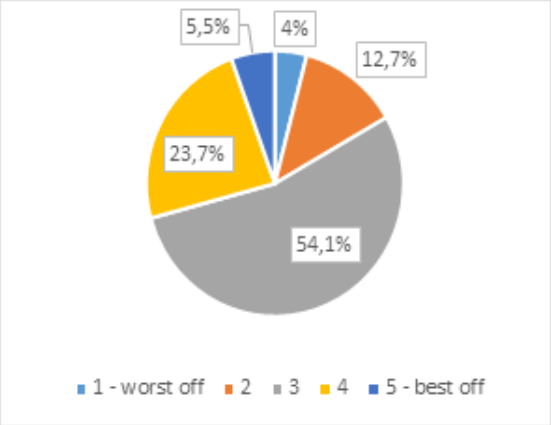


Figure AT3: Respondents by perceived social status

4.1.1.2 Assessment of climate change-related results with respect to themes and subthemes

Two questions directly relate to climate change. As Figure AT4 shows, most respondents (45%) agree with the statement that the world's temperature has been gradually rising over the past 100 years, as most scientists state. Only around 6% (rather) disagree and 14% are not sure. For the sample from Austria that excludes Vienna, respondents with university or college degree were most likely to answer with Yes (63%).

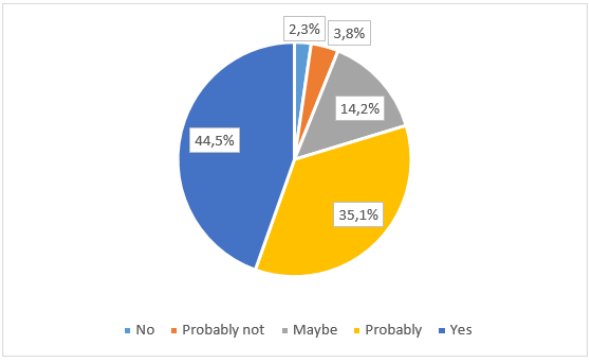


Figure AT4: Climate change

When asked about the cause of climate change, assuming the temperature is rising, more than half of the respondents (54%) think that climate change is mainly caused by human activities, and only 11%, mainly due to natural causes (Figure AT5). These results indicate a strong acceptance of human made climate change in our lifetime.

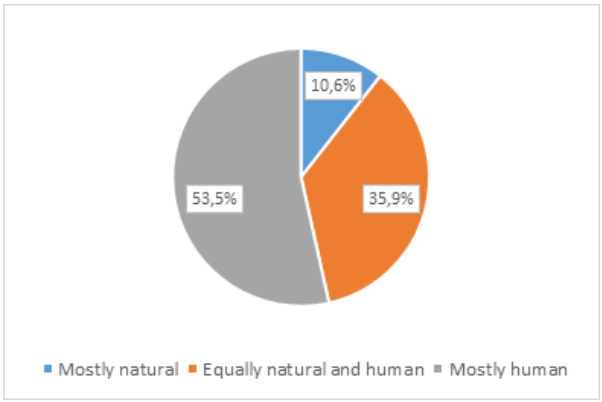


Figure AT5: Cause of climate change

In a similar vein to above results, higher educated respondents are more likely to accept human made climate change. Overall, this indicates a potential obstacle with motivating people to follow a carbon conscious lifestyle. The underlying assumption for that statement is that someone who disagrees with humans being mainly responsible for a global temperature rise is less likely to see a necessity to act on it. It does not seem unreasonable to also assume this for people who attribute the rise in temperature to natural and human causes alike. E.g., it is easier to find a justification why not to act. Therefore, it would seem useful that CAMPAIGNers challenges address this potential obstacle by, e.g., defining

challenges specifically for people who disagree with the notion that humans are responsible for climate change. In part this may be achieved with the gamification of challenges where, for instance, a higher score is the main goal and a more carbon conscious life is essentially a side effect.

4.1.1.3 Assessment of energy behaviour/attitude related results with respect to themes and subthemes

A considerable part of the ECHOES questions deals with respondents' energy behaviour and their attitudes towards energy related topics. 47% of the respondents strongly agree that the use of more renewable energy sources (RES) will benefit the environment and another 38% moderately agree (Figure AT6). Only around 4% think there are no benefits for the environment.

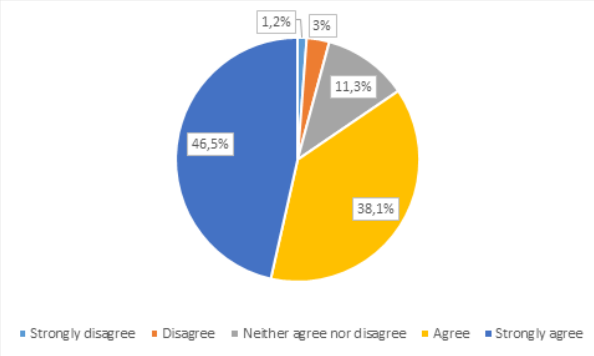


Figure AT1: Renewable energy sources benefit the environment

When stating that the use of more renewable energy sources will create new jobs, again 38% agree moderately (Figure AT7). However, only 20% strongly agree and 31% are uncertain. This means that while the respondents are less certain about the creation of new jobs than the benefits for the environment, the majority still agrees with the statement.

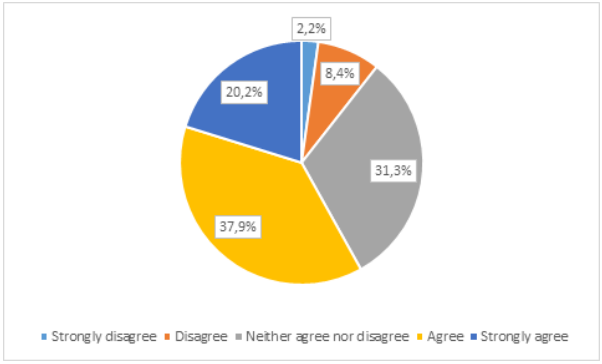


Figure AT7: Renewable energy sources create new jobs

Questions about energy policies depict similar results. Figure AT8 shows the acceptance of energy policies that protect the environment but induce higher costs. Approximately half of the respondents agree or strongly agree with the statement, one quarter is undecided, and one quarter disagrees. Interestingly, the answers do not vary significantly by income group. For the sample from Austria excluding Vienna, however, there is a slight tendency as expected. There is no apparent difference in answers between urban and rural respondents.

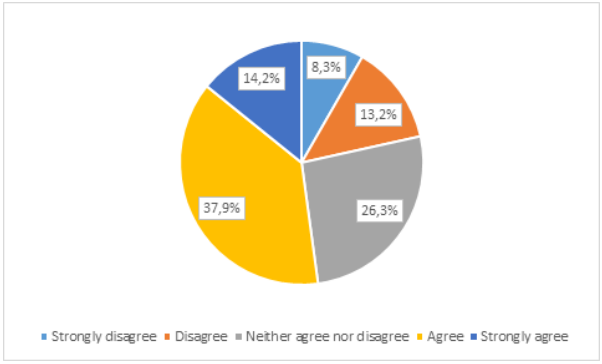


Figure AT8: Policies that protect the environment

Figure AT9 shows the acceptance of energy policies that create new jobs but induce higher costs. The distribution of the answers is almost the same as in Figure AT7, again slightly more than half agree with the statement. While the income correlation is also similar, for rural respondents, job creation seems to be of slightly more importance than for urban respondents. This indicates that higher costs generally find acceptance, however, there is disagreement over

whether energy policies' primary importance is protecting the environment or creating new jobs.

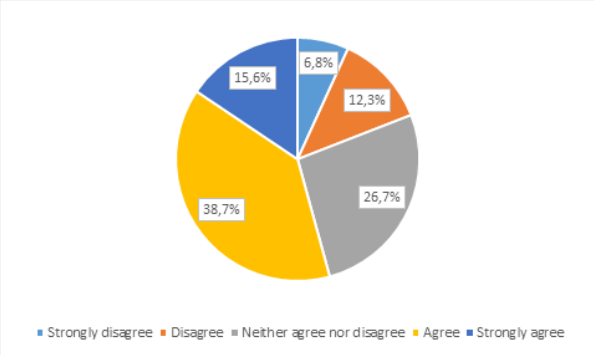


Figure AT9: Policies that create new jobs

These attitudes toward energy topics seem to translate to real actions in a relatively consistent way. Respondents were asked whether they were interested in the possibility of a real investment in renewable energy. If so, their email address was to be forwarded to respected companies that offer community-based investments in green power. Further, their email would be used to send them investment opportunities, while respondents could withdraw their confirmation to receive such offers at any time. The results above would suggest that again about approximately half of the respondents might be interested in such an opportunity, with 43% showing interest. To sum up, the sample shows a strong acceptance of the benefits of renewable energy sources and of higher costs induced by energy policies. These attitudes are underlined by a relatively strong interest in a real investment in renewable energy.

4.1.1.4 Assessment of lifestyle-related results with respect to themes, subthemes, and focal areas

A central part of the ECHOES database sheds light on lifestyle-related topics and gives valuable insights into energy-related every-day actions and opinions. Figure AT10 reveals that 57% of the respondents agree that each individual can do much to support the energy transition. Further, 73% agree that people can act together to achieve the energy transition (see Figure AT11).

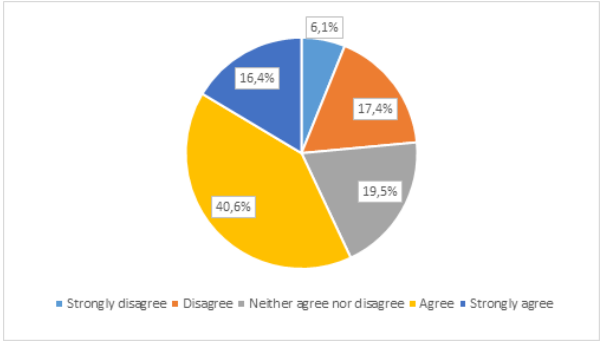


Figure AT10: I can do a lot to support the energy transition.

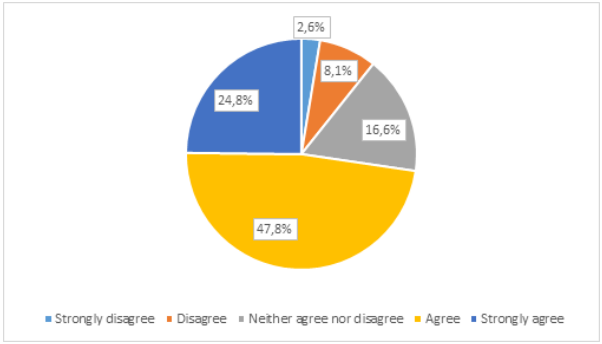


Figure AT2: We as people can act together to achieve the energy transition

Public and private transport play an important role in the energy-life of individuals. Figures AT12 – AT20 display various public transportation (PT) related results. Almost half of the respondents are satisfied with the public transportation system in their area while about 28% are dissatisfied. For the case of the sample from Austria that excludes Vienna, a lower 42% are satisfied with the public transportation system in their area. Around 31% are dissatisfied (see Figure AT12).

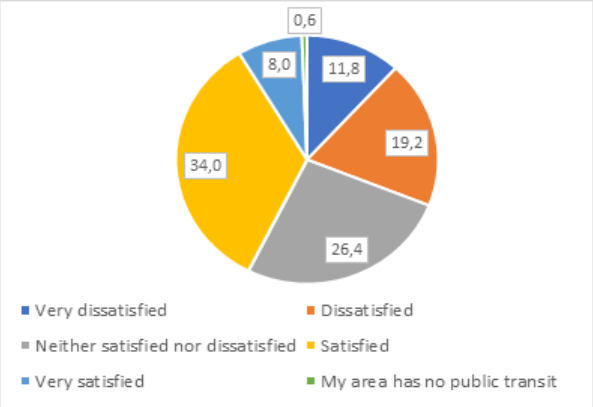


Figure AT3: Satisfaction level of respondents on current public transportation system (excluding Vienna)

Hence, this indicator is especially dependent on location and varies within the country. Around 40% agree that the public transportation system in their area is environmentally friendly. However, 45% are uncertain and 18% disagree (see Figure AT13). For the sample that excludes Vienna, around 33% of the respondents agree that the public transportation system in their area is environmentally friendly. However, 45% are uncertain and 22% disagree.

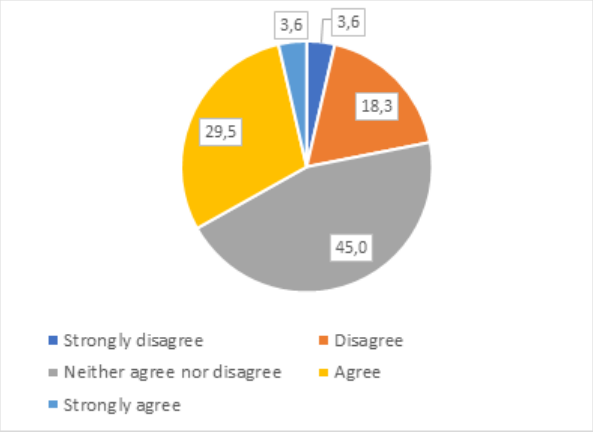


Figure AT 4: Q19. The public transportation system in my area to be environmentally friendly (excluding Vienna)

This might indicate potential obstacles in developing challenges that aim to increase use of public transport over motorized private transport: If the benefit of public transport with regards to a carbon conscious lifestyle is not clear there's less incentive to switch. Therefore, it seems reasonable that challenges or other aspects of the application should reduce such misconceptions.

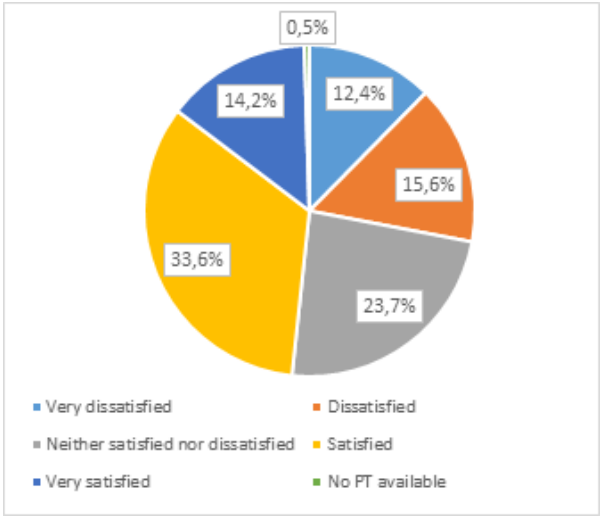


Figure AT 5: Satisfaction level of respondents on current public transportation system

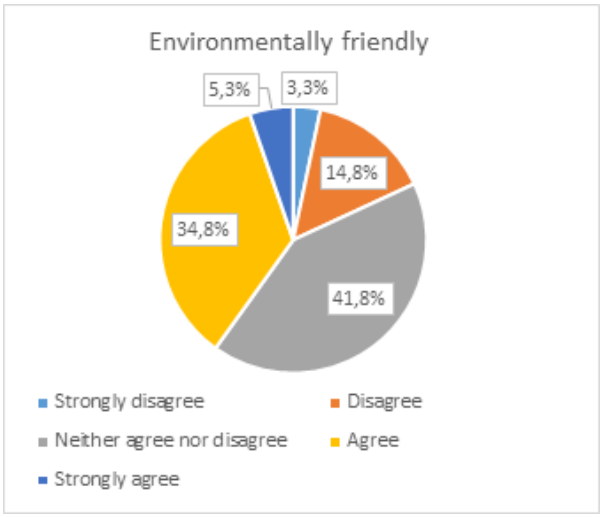


Figure AT 6: The public transportation system in my area to be environmentally friendly

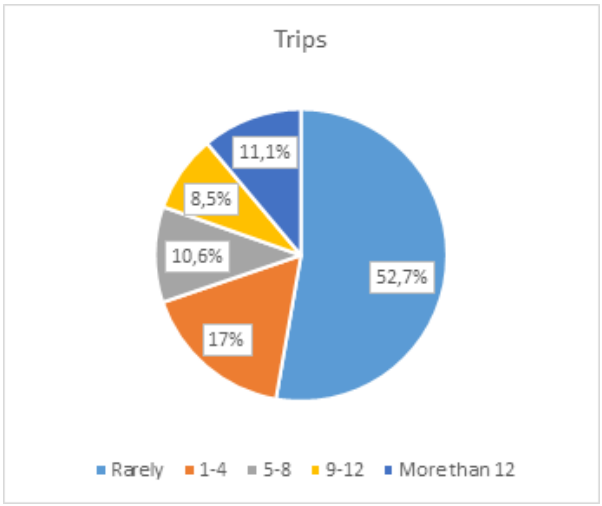


Figure AT 7: Trips per week using public transportation on average

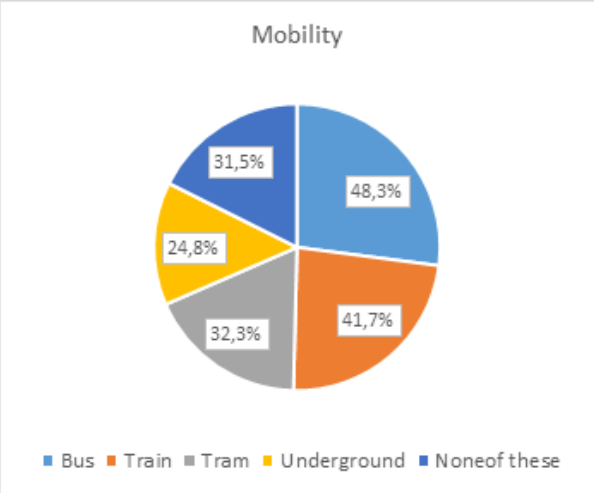


Figure AT8: Type(s) of public transportation use as a part of routine mobility

Looking at the specific number of trips using public transportation, while public transportation clearly seems to be relatively highly regarded, it may be partly underutilized. For the country sample (see Figures AT15-AT17), 53% of the respondents rarely use public transport on a weekly basis, even though this indicator includes travels to work or for shopping. 11% use it more than 12 times per week. These are likely to be individuals that commute using public transportation. For the sample excluding Vienna, however, a higher, 62% of the respondents rarely use public transport on a weekly basis. Only 6% use it more than 12 times per week (see Figure AT18).

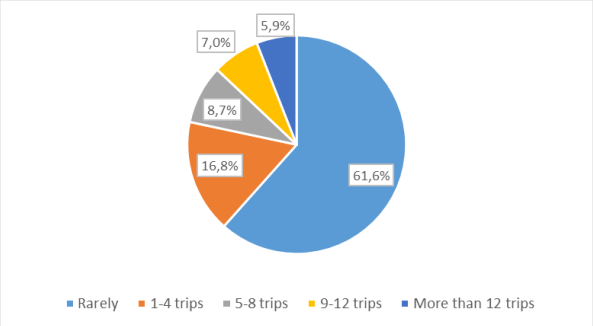


Figure AT18: Trips per week using public transportation on average (excluding Vienna)

The youngest age group seems to use public transport the most frequently, and the oldest age group the least. While income does not play an important role, urban respondents report significantly higher weekly trips than rural respondents. Depending on the exact location, public transport may be scarce (e.g., infrequent intervals or not at all at weekends). In such cases, it may be beneficial to assign these people with challenges focused on other goals than increased use of public transports.

Lastly, the most popular type of public transport seems to be bus, with 48%, followed by train, with 42%, and tram, with 32%. However, a third of the respondents never routinely uses any form of public transport. Underground transportation in Austria is only relevant in Vienna. When the sample excluding Vienna is considered, for rural respondents the most popular type of public transport seems to be by train with 41%, followed by bus with 37% and tram with 15%. However, almost half of the respondents do not use any of these routinely. In comparison, only 24% of the urban respondents use none of these possibilities routinely. Bus is the most popular type with 56%, followed by train (46%) and tram (36%) (see Figure AT19 and AT20).

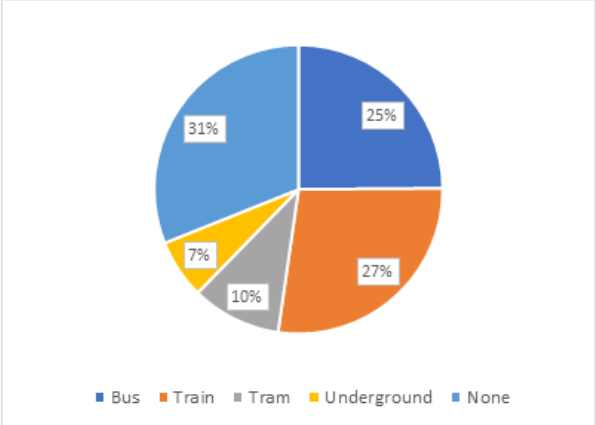


Figure AT19: Type(s) of public transportation use as a part of routine mobility (Rural area)

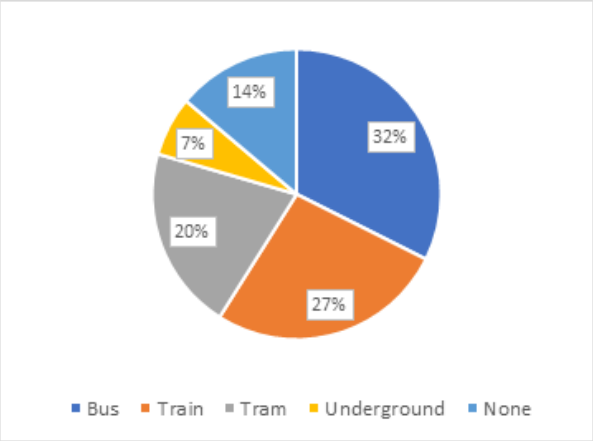


Figure AT20: Type(s) of public transportation use as a part of routine mobility (Urban area)

Regarding private transportation, a considerable share of respondents (16%) drives no distance by car as a driver per year, even though this indicator includes driving to work, etc. For the Austria sample excluding Vienna, this rate is at a lower 11%. Most respondents drive only a limited amount of kms per year, with almost one quarter driving between 5 to 10 thousand kilometres per year. The exact distributions are illustrated in Figures AT21 and AT22.

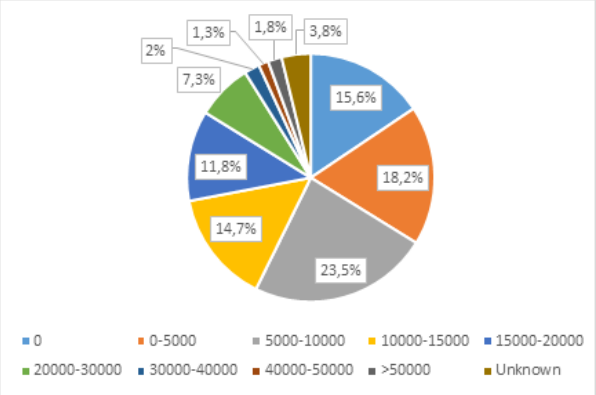


Figure AT21: Kilometres per year

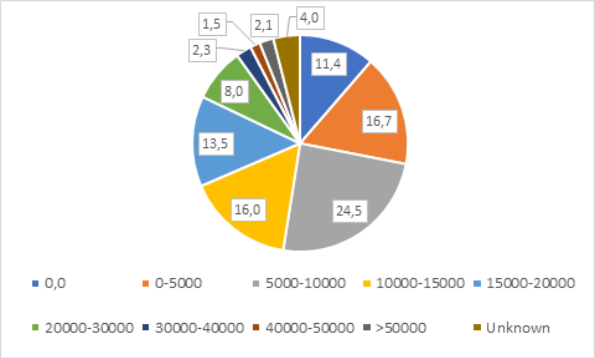


Figure AT22: Q75. Kilometres per year (excluding Vienna)

As Figure AT23 shows, driving alone in one's car is a popular choice, one reason might be that this includes commuting. 43% drive alone very often or almost always, and another 25%, half of the time. Only 11% almost never drive alone in their car. These results reveal a substantial energy saving potential in private transportation.

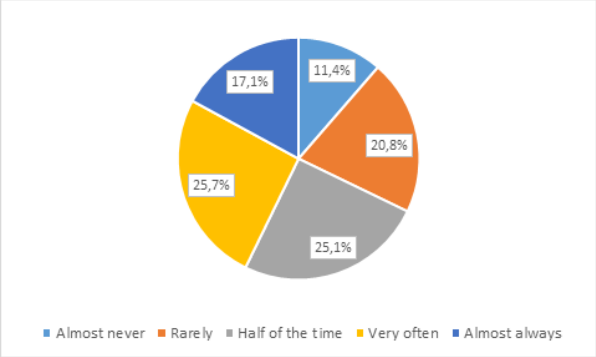


Figure AT9: Driving alone

This potential is supported by Figure AT24, which indicates that almost 90% of the respondents have never tried car-sharing, although a total of 36% are interested. Only 2.5% have an unfavourable view after trying it.

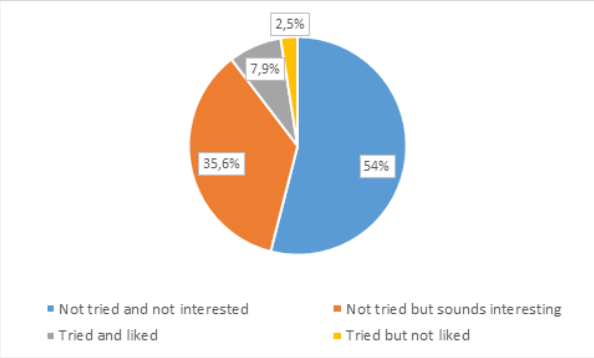


Figure AT24: Car sharing

Bicycle use is another important domain of private transportation. Figure AT25 reveals that almost 60% of the respondents almost never cycle to work or to shops. This in turn means that around 40% cycle somewhat regularly for work and shopping, with 7.5% usually cycling for work and shopping all year long. While for many of these remaining 60%, it might be implausible to use a bike due to larger distances, the 40% indicate that it is possible for a large share of the respondents, and thus offers a considerable potential for improvements. For the sample excluding Vienna, the results are slightly different. More than half (53%) of the urban respondents almost never use their bicycle to go to work or to do shopping. Overall, urban respondents use their bicycle more frequently than rural respondents. Around 47% of urban respondents use their bicycle somewhat regularly for work and shopping, with 11% usually using a bicycle for work and shopping all year long (see Figures AT26 and AT27).

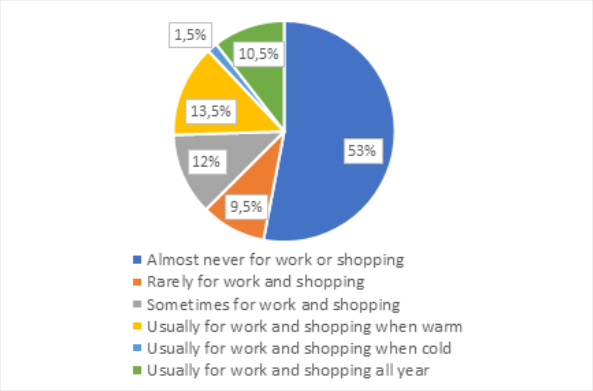


Figure AT10: Bicycle use (Urban)

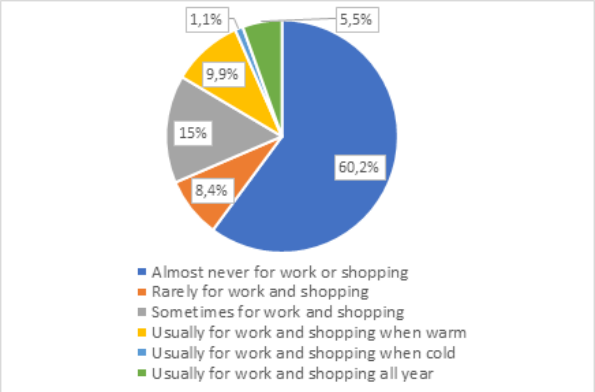


Figure AT26: Bicycle use (Rural)

Figure AT27: Bicycle use

Electric bicycles might offer an acceptable option for many. Figure AT28 shows that 23% agree that they intend to purchase an electric bicycle within the next five years, and another 18% are undecided. However, 56% disagree. Since only 4% own an electric bicycle, an uptake of this rate might offer a possibility to decrease distance driven by car and increase the usage of bicycles for work and shopping.

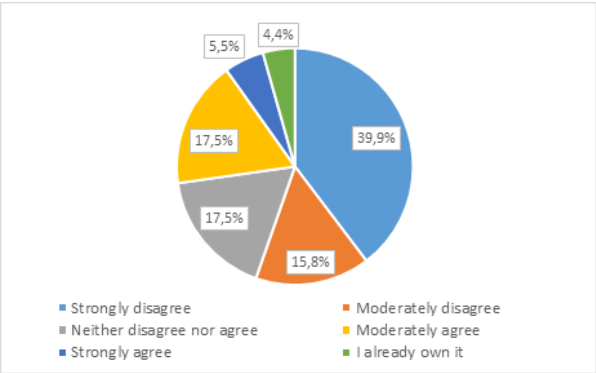


Figure AT28: Electric bicycle

A large part of energy-lifestyle is related to decisions made at home. Figures AT29-AT32

present four important issues. Regarding heating, 52% of the respondents have central heating for the whole dwelling and 28% district heating to several houses. For the sample excluding Vienna, the rates are similar, with 55% of the respondents having a central heating, and 24% having district heating. The remaining answers indicate stoves, electric heaters, or lack of knowledge of their heating system.

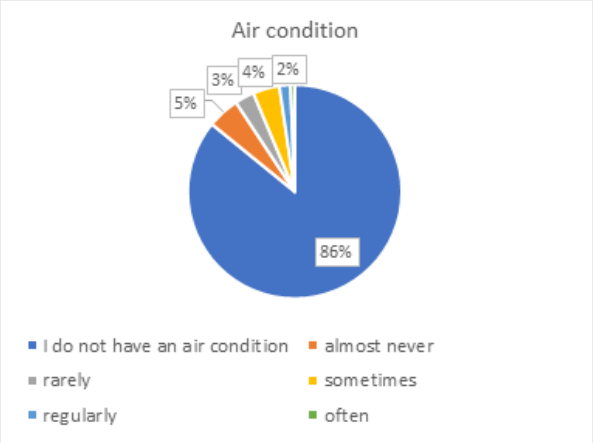


Figure AT29: Air condition use (excluding Vienna)

Regarding air conditioning, 82%, the vast majority, owns no air conditioner and only about 3% use one regularly or often. Similarly, for the sample excluding Vienna, 86%, does not own an air conditioner and about 2% use one regularly or often.

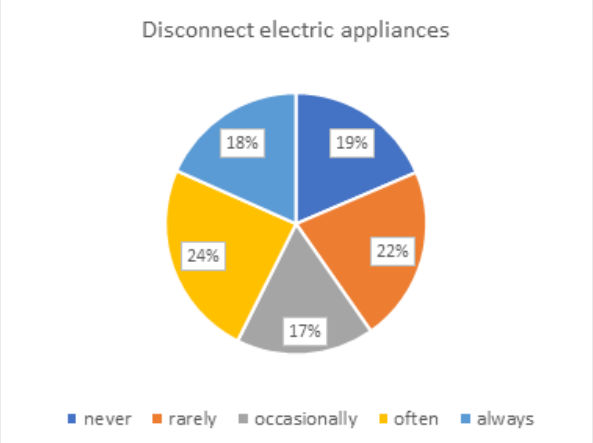


Figure AT30: Disconnect electric appliances (excluding Vienna)

Hence, the savings potential seems small in this case. Since air conditioners are experiencing a rise in popularity, a feasible goal for challenges may be to discourage participants from buying air conditioners by educating them on how living spaces can be thermally regulated during summer, (e.g., by keeping windows and blinds shut during the day and only opening the windows early in the morning). If no natural ventilation is achieved during that time, the use of fans may be encouraged.

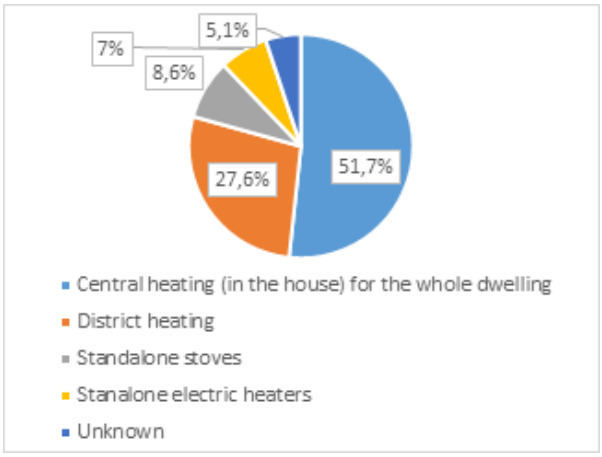


Figure AT31: Heating

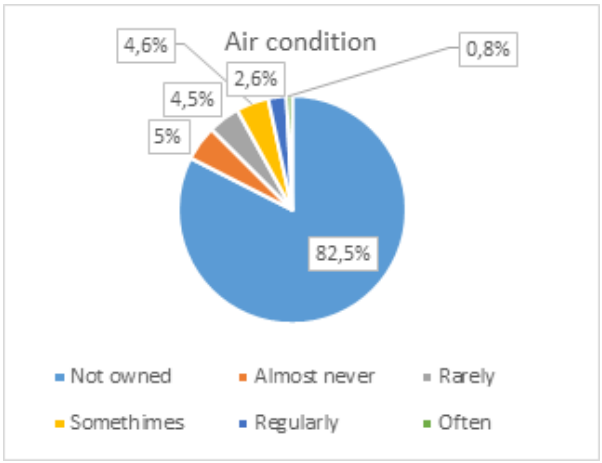


Figure AT32: Air condition use

About approximately 40% often or always disconnect electric appliances when not in use. This means that 60% frequently do not unplug appliances, including 19% that never do (See figure AT33). This might offer a considerable and easy-to-implement opportunity for many households to save energy and money without loss of comfort. Lastly, when asked whether respondents purchase electricity from a provider with a particularly high share of renewable energy

production, 47% answer Yes, and 8%, No. This means that 45% do not know whether their electricity provider has a larger share of renewables. A certain share of customers might switch to a provider with a higher share of renewables when they are better informed (see Figure AT34).

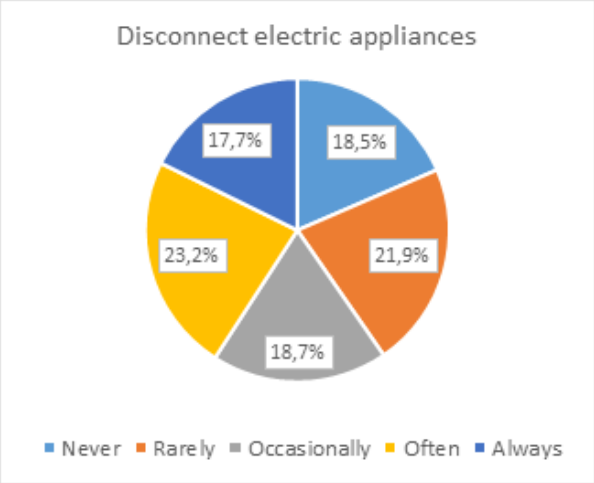


Figure AT33: Disconnect electric appliances

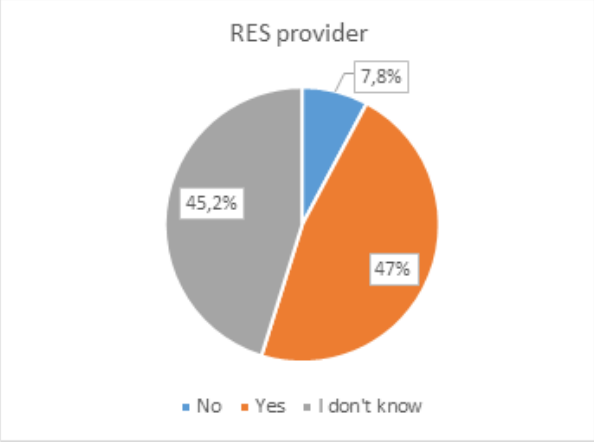


Figure AT11: Purchase electricity from green provider

To sum up, the public transport system is well accepted, but has room for improvement. Other sources of potential savings are the tendency of many to drive alone in their car and a considerable but as yet underutilized interest in car-sharing. Limited bike usage and the relatively rare habit of disconnecting of appliances are areas for building on. Finally, many respondents are still under-informed about their electricity provider.

4.1.1.5 Interim Conclusion and Suggestions

In terms of age and education, the Austrian sample presents a well-balanced group with more than 50% living in cities. The results indicate a strong acceptance of human made climate change in our lifetime. Energy policies find a strong acceptance, without higher costs seeming to be a significant barrier. Renewable energy sources are considered as an influential factor, both in an environmental and economic sense. The majority is aware of the importance of both the individual and the group in achieving changes. These attitudes are a solid basis for accepting the need and the meaningful impact of changes in human actions. This reasoning is supported by an actual interest of 43% of the respondents in a real investment in renewable energy.

The public transport system and its environmental benefits are in general well accepted, however, continue to be underutilized by a large share of respondents. In general, younger and respondents in urban areas use public transport more frequently. An uptake of public transport utilization could substantially decrease distances driven as driver. Similarly, this could be achieved by a change in individuals' habits of driving alone. In a similar vein, there is a considerable potential in car-sharing, which, depending on the implementation, could also result in less distance driven, fewer cars, environmentally friendlier cars, etc. Increasing bicycle usage for work and shopping would not only decrease motorized driven distances and traffic, but also positively affect health and well-being. However, individuals might connect these changes in habits with unreasonable loss of comfort. A moderate interest in electric bicycles, surprisingly slightly more pronounced for lower income respondents, supports this reasoning. Individuals might connect these changes in habits with unreasonable loss of comfort. The issue of disconnecting appliances concerns about

approximately 60% of respondents and is an energy and cost saving change that comes with no loss of comfort. Finally, 45% of respondents do not know whether their electricity provider has a particularly large share of renewable energy sources, which might prevent individuals from purchasing their electricity from a greener provider. This is supported by the fact that 42% of the uninformed would accept higher costs induced by energy policies that benefit the environment.

Based on this assessment, the main policy conclusion is to incentivize the shift from private car use to a more collective transport behaviour, with increasing usage of public transportation and car sharing services as well as increased bicycle usage. Information provision about their electricity provider might also be a valuable option.

4.1.2 Finland with a focus on Lahti

4.1.2.1 Demographics

The ECHOES database includes 604 respondents from Finland. 12 respondents are from the city of Lahti. Due to this small number of city-specific respondents, the assessment of the ECHOES data is conducted at the country level. For the analysis on the city level, results from surveys done in Lahti in 2016 and 2019–2020 are utilized.

Lahti is a city of 120 000 residents in Finland. It is the capital of the region Päijät-Häme and its growing region is one of the main economic hubs of Finland. Lahti is situated about 100 kilometres north-east of the capital city Helsinki. Lahti is a frontrunner in sustainability, environmental protection, circular economy and citizen engagement, and has thus been nominated as the European Green Capital 2021. Of all respondents from Finland, 50% are male and 82.9% live in urban areas with more than 10 000 inhabitants. The largest group of respondents are between 18 and 34 years old (35%), approximately 20% fall in each of the remaining three age categories (see Figure FI1).

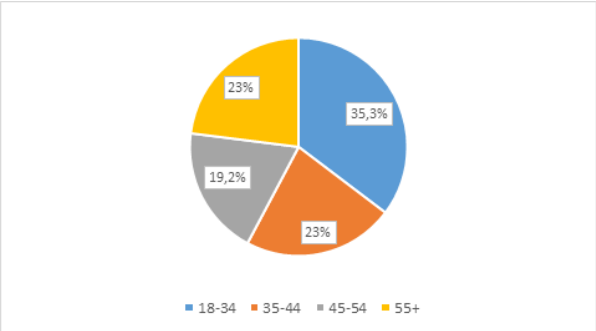


Figure FI1 Respondents by age

55% of the respondents are employed, around 19% are retired, 11% students and 11% unemployed. As indicated in Figure FI2, educational attainments in the sample are extremely high, with 53% tertiary education, 16% A-levels (qualification for university) and 23% with a professional training in practical skills, only 5% attained up to secondary education.

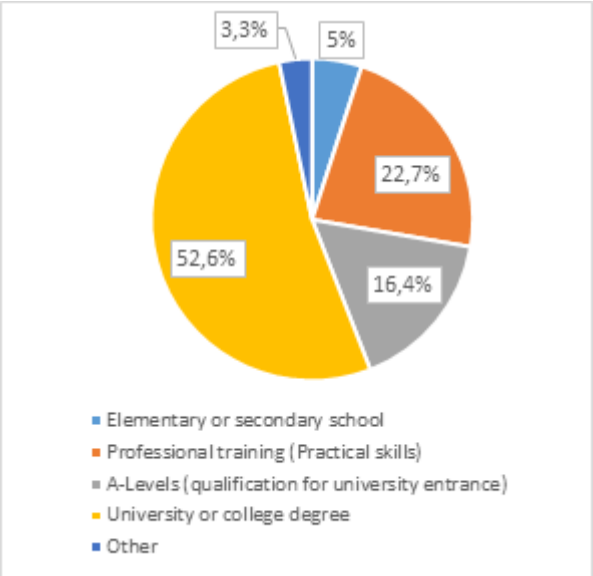


Figure FI2: Respondents by education level

Figure FI3 shows how respondents place themselves on a subjective social ladder, with 1 indicating being at the lowest level and relatively speaking worst off, and 5 being at the highest level and best off. While the vast majority (53%) place

themselves in the middle, in total, 77% place themselves in either the middle or higher level, and only 5% feel they are socially worst off in the society. All in all, the sample presents a relatively young, highly educated group, mainly living in cities and with a solid self-perceived social standing.

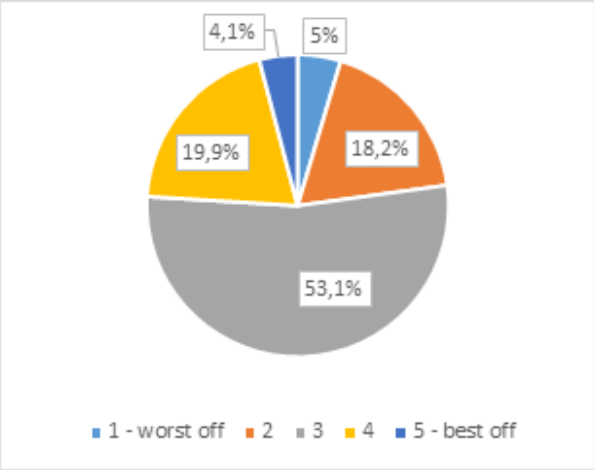


Figure FI3: Respondents by perceived social status

Previous studies in Lahti

A postal survey was done in 2016 considering three residential areas in the city of Lahti including 154 respondents. 44% of the respondents were women and 56% men. All the respondents were over 25 years old, and one third were of the age between 35 and 44. 3% were over 75 years old. Almost 40% of the respondents had an education related to technology, approximately 15% to health and social care, and 15% to economics and social science. A third of the respondents earned 20 000-35 000 euros, a fourth earned 35 000-45 000 euros per year.

A postal survey concerning urban mobility was done in the city of Lahti in 2019-2020 and included 358 respondents. 47% of the respondents were men and 53% women. 32% of the respondents were 16-39 years old, 32% were 40-59 years and 36% were over 60 years. 21% of the respondents had a basic education or less, and half of the respondents had an upper secondary education. Almost half were full or part-time workers, a third was retired, and 10% students.

4.1.2.2 Assessment of climate change-related results with respect to themes and subthemes

In the ECHOES survey, two questions directly relate to climate change. As Figure FI4 shows, most respondents (55%) agree with the statement that the world's temperature has gradually been rising over the past 100 years, as most scientists state. Only around 5% (rather) disagree and 11% are not sure.

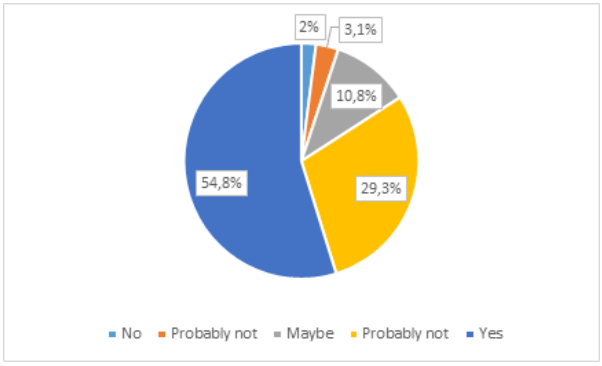


Figure FI4: Climate change

And when asked about the cause of climate change, assuming the temperature is rising, more than half of the respondents (62%) think that the cause is mainly human activities and only 6% think that it is mainly due to natural causes (Figure FI5). These results indicate a strong acceptance of human made climate change in our lifetime.

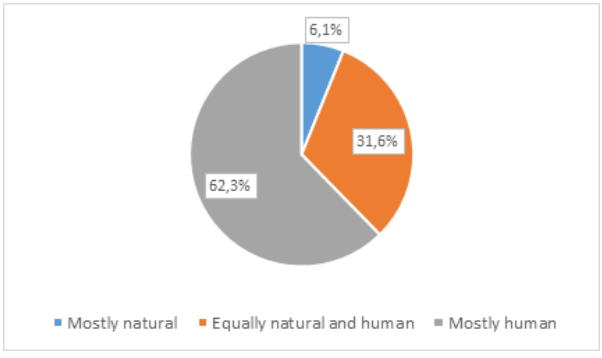


Figure FI5: Cause of climate change

The majority of the respondents (62 %) do not want to donate some of their compensation provided in the survey. There is no significant difference whether the respondent had read the story behind. It seems that there is not wide interest in this kind of donation (see Figure FI6).

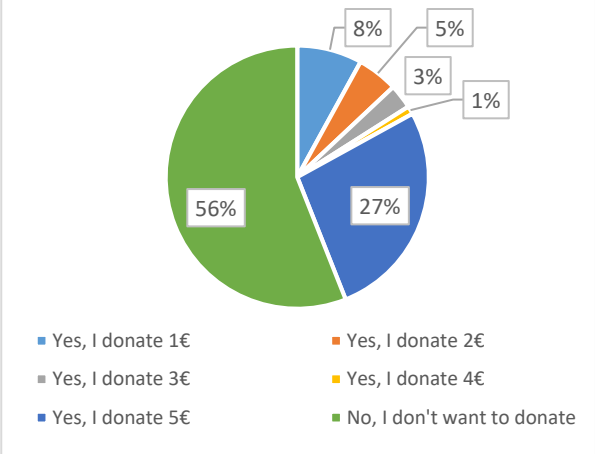


Figure FI6: Donation to myclimate.org to help fight climate change

4.1.2.3 Assessment of energy behaviour/attitude related results with respect to themes and subthemes

A considerable part of the ECHOES questions deals with respondents' energy behaviour and their attitudes towards energy related topics. 71% of the respondents agree that they feel proud if other people in their municipality save energy (see Figure FI7).

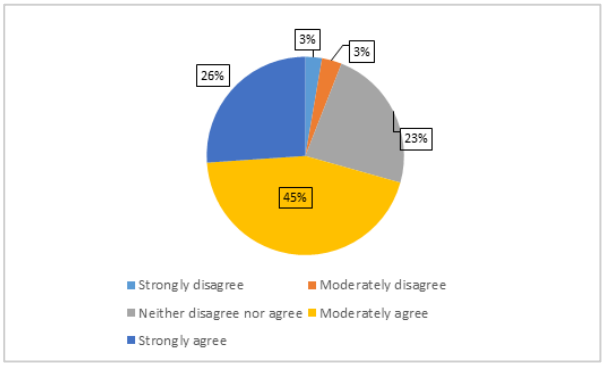


Figure FI7: Opinion whether respondents feel proud if other people in their municipality save energy

As indicated in Figure FI8, 51% agree and 32% neither disagree nor agree that they feel angry about the fact that people are not saving energy in their municipality.

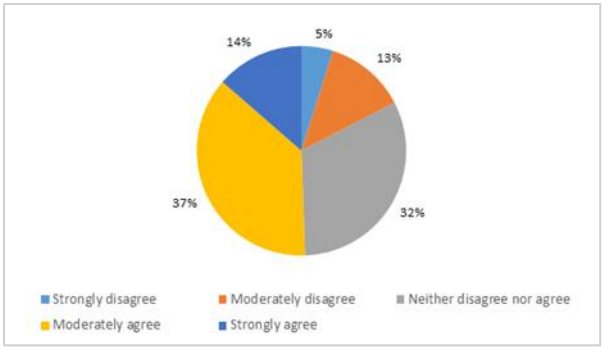


Figure FI8: Opinion whether respondents feel angry if other people in their municipality do not save energy

It seems that more people are reacting positively than negatively to other people's actions and are rather feeling proud than angry about the energy choices of other people. In addition, the actions of people in their own municipality wake more feelings than the actions of people overall in Finland.

As shown in Figure FI9, 58% agree and 30% neither disagree nor agree that many people in their municipality would support for them to use less. 46% moderately agree that people in their country would support them to use less energy.

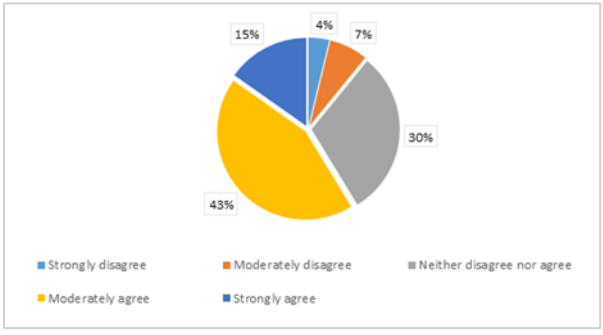


Figure FI9: Opinion whether respondents feel that other people in their municipality would support it if they used less energy

42% agree and 37% neither disagree nor agree that a growing number of people in their municipality try to save energy (see Figure FI10).

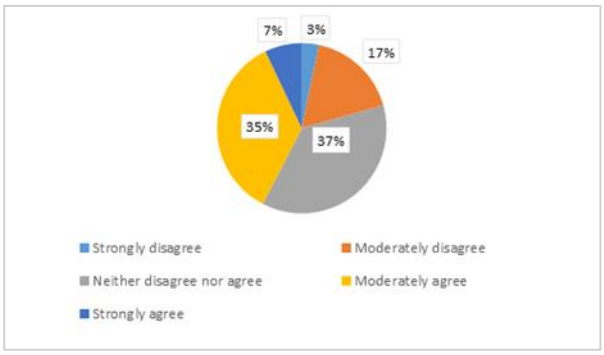


Figure FI10: Opinion on whether respondents feel that a growing number of people in their municipality try to save energy

55% of the respondents strongly agree that the use of more renewable energy sources (RES) will benefit the environment and another 29% agree moderately (Figure F11). Only around 4% do not think that using more RES benefits the environment.

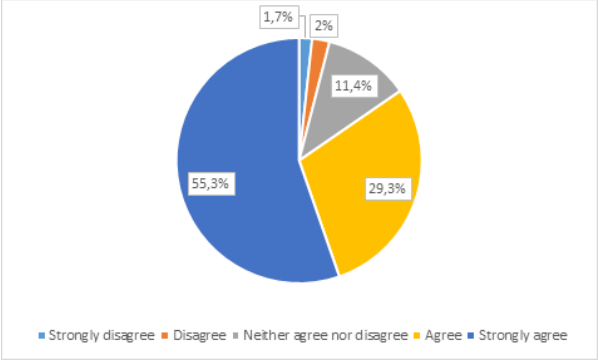


Figure FI1: Renewable energy sources benefit the environment

When considering whether the use of more renewable energy sources will create new jobs, 38% agree moderately (Figure FI12). However, only 17% strongly agree and 34% are uncertain. This means that while the respondents are less certain about the creation of new jobs than the benefits for the environment, the majority nevertheless agrees with the statement.

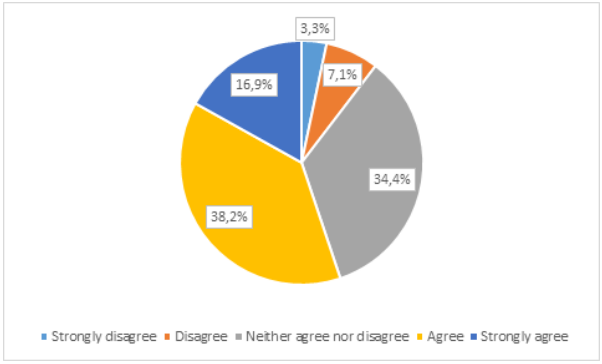


Figure FI12: Renewable energy sources create new jobs

68% agree that they feel a personal obligation to support energy policies that support the energy transition (see Figure FI13).

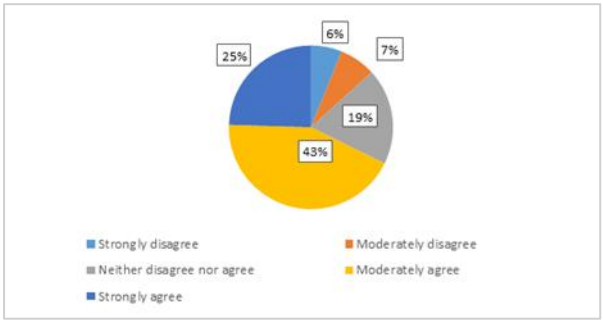


Figure FI13: Whether the respondents feel a personal obligation to support energy policies that support the energy transition

Figure FI14 shows the acceptance of energy policies that protect the environment but induce higher costs. About approximately half the respondents agree or strongly agree with the statement, one quarter is undecided and one quarter disagrees.

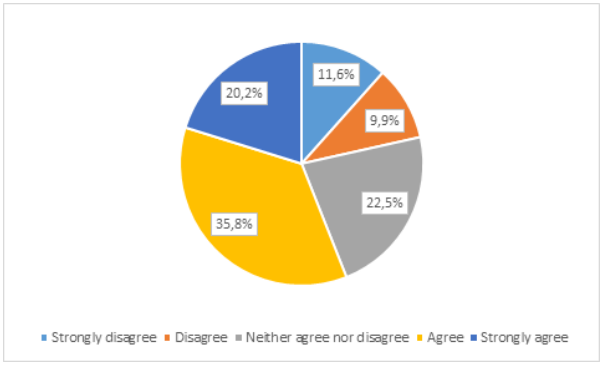


Figure FI14: Policies that protect the environment

Figure FI15 shows the level of acceptance of energy policies that create new jobs but induce

higher costs. The distribution of the answers is similar to in Figure 4.24, more than half of the respondents agree. This indicates that higher costs generally find acceptance, however, whether energy policies protect the environment or create new jobs seems of equal importance.

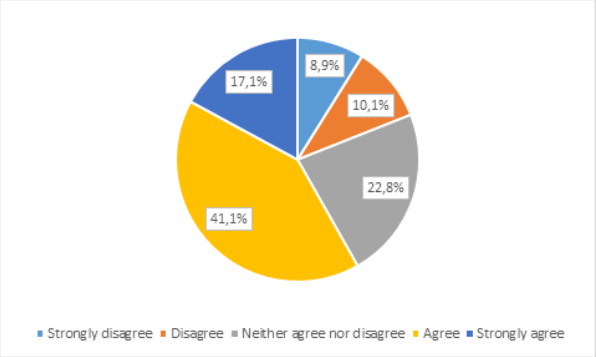


Figure FI15: Policies that create new jobs

In the specific study conducted in Lahti in 2016, most of the respondents put emphasis on price (55%) or locality (30%) when choosing an electricity contract. Only 6% of the respondents chose the electricity contract for its environmental friendliness. Most of the respondents turn off lights and computers when not needed. 95% of the respondents usually or always turn off lights when not needed. Approximately 70% of the respondents usually or always turn off the off the computer instead of putting it on standby when not in use.

However, these attitudes toward energy topics seem to translate to real actions only in a limited way. Respondents who were interested in the possibility of a real investment in renewable energy had their email address forwarded to respected companies that offer community-based investments in green power. Further, their email would be used to send them investment opportunities, while respondents could withdraw their confirmation to receive such offers at any time. The results above would suggest that again, approximately half the respondents might be interested in such an opportunity. However, the results show that only 27%, approximately one quarter, are interested in the possibility of a real investment in renewable energy. To sum up, the sample shows a strong acceptance of the benefits of renewable energy sources and of higher costs induced by energy policies. These attitudes are however only supported to a limited degree, rather than a strong interest in a real investment in renewable energy

4.1.2.4 Assessment of lifestyle-related results with respect to themes, subthemes, and focal areas

A central part of the ECHOES database sheds light on lifestyle-related topics and gives valuable insights into energy-related every-day actions and opinions. Figure FI16 reveals that 51% of the respondents agree that each individual can do much to support the energy transition. Further, 74% agree that people can act together to achieve the energy transition, pointing towards the importance of the collective (see Figure FI17).

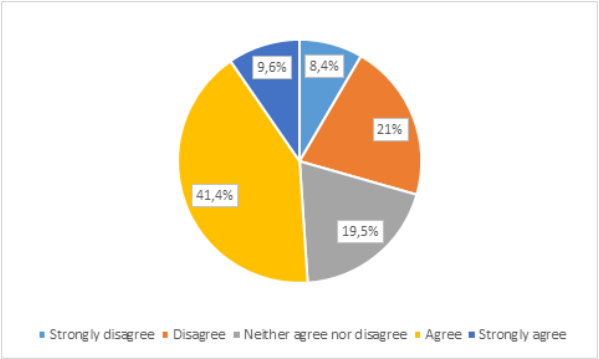


Figure FI16: I can do a lot to support the energy transition

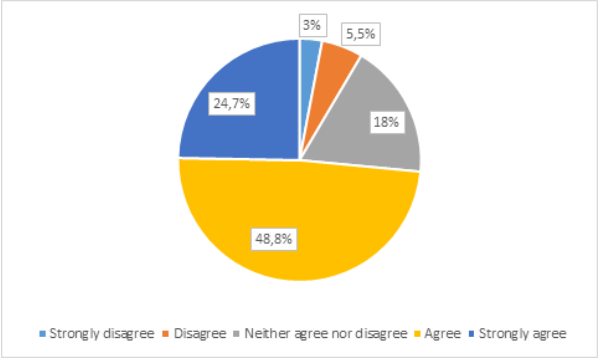


Figure FI17: We as people can act together to achieve the energy transition.

Public and private transport play an important role in the energy-life of individuals. Figure FI18 to FI21 display various public transportation (PT) related results. Less than half the respondents are satisfied, and around 27% are dissatisfied with the local public transportation system.

In the study conducted in Lahti in 2019-2020, approximately half of the respondents were satisfied or very satisfied with the current public transport system in the city of Lahti. Approximately 20% of the citizens were dissatisfied or very dissatisfied. These results are quite similar results when compared to the national ECHOES survey. Only 32% agree that the public transportation system in their area is environmentally friendly. 44% are uncertain and 24% disagree.

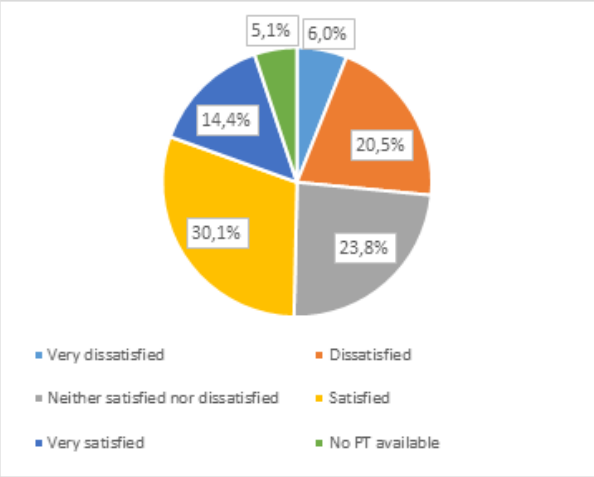


Figure FI18: Satisfaction level of respondents with current public transportation system

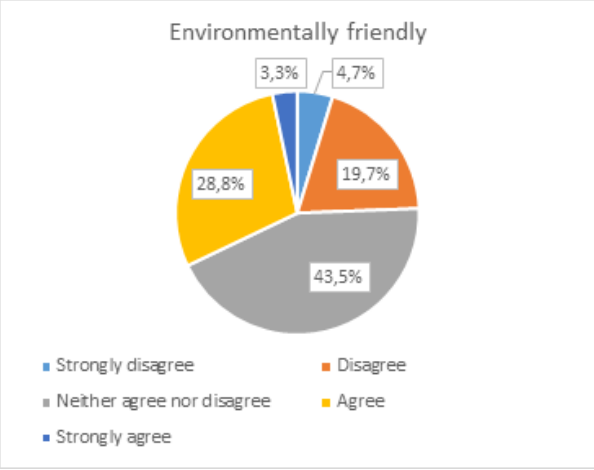


Figure FI19: The public transportation system in my area is environmentally friendly

Looking at the specific number of trips using public transportation, while public transportation seems to be somewhat highly regarded, it is clearly underutilized. 63% of the respondents rarely use public transport on a weekly basis, even though this indicator includes travels to work or for shopping. Only 5% use it more than 12 times per week (Figure FI20). These are likely to be individuals that commute using public transportation. Lastly, the most popular type of public transport seems to be bus, with 57%, followed by train, with 37% and underground, with 17%. However, a third of the respondents routinely uses none of these (Figure FI21). Underground transportation in Finland is only relevant in Helsinki.

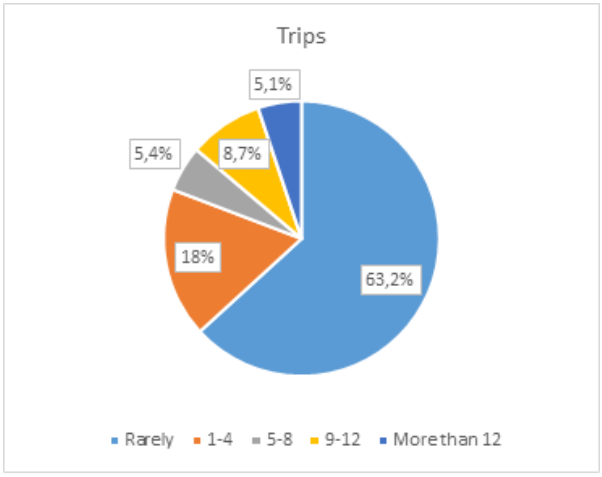


Figure FI20: Trips per week by using public transportation on average

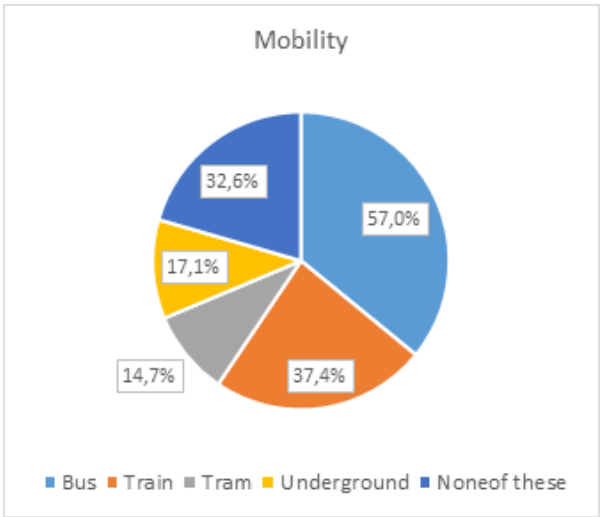


Figure FI21: Type(s) of public transportation use as a part of routine mobility

As shown in figure FI22, 14% of the respondents answered that they had spent 6-10 hours on private flights during the last year and 49% answered they have not been on private flights.

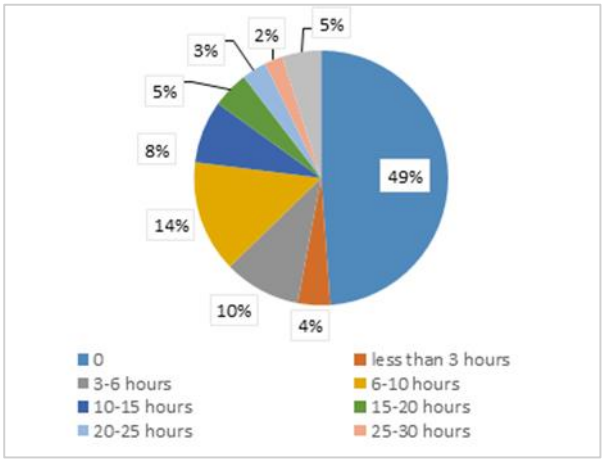


Figure FI22: Hours spent on private flights during the last year

89% answered that they had not taken business trips by plane during the past year. Many of the people are travelling by plane for leisure but business flights are not that common among the respondents.

Regarding private transportation, a considerable share of respondents (17%) does not drive any distance with a car as a driver per year, even though this indicator includes driving to work, etc. Most respondents drive only a limited distance per year, with almost one quarter driving between 1 to 5 thousand kilometres per year. The exact distribution is illustrated in Figure FI23.

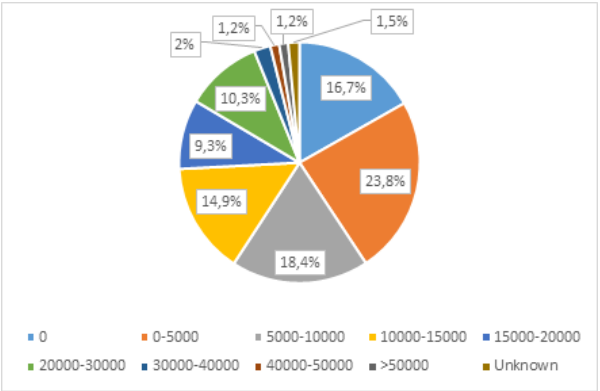


Figure FI23: Kilometres per year

As Figure FI24 shows, driving alone in one's car is a popular choice, one reason might be that this includes commuting. 46% drive alone very often or almost always, and another 18% half of the time. Only 13% almost never drive alone in their car.

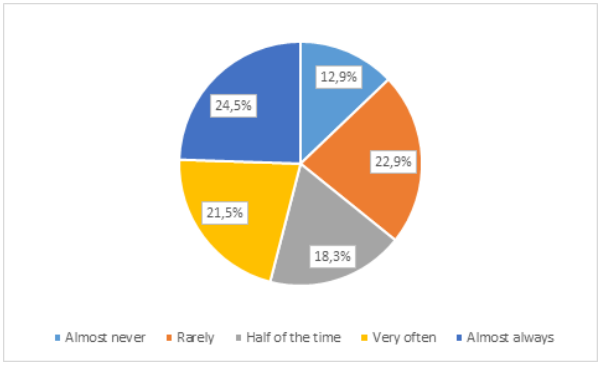


Figure FI24: Driving alone

There are normally only 1 (47 %) or 2 (43 %) people in total in the private car when driving as shown in figure FI25.

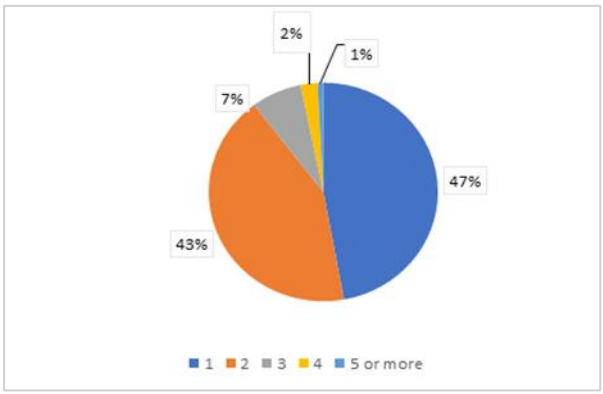


Figure FI25: Number of people in total in the car with the respondent as the driver

Owning private cars is very common in Finland and it is normal to drive alone or just with one other passenger. Electric, hybrid or biogas cars are not yet common, neither are motorcycles and or scooters.

In the specific study conducted in Lahti in 2016, the respondents had 1.7 cars per household, and they drove approximately 50 kilometres per day. In the study conducted in Lahti in 2019-2020, the shares for private vehicles were 61% in summer and 65% in winter. Respondents used a private vehicle a

little less when travelling to work or study (56% and 57%) than to the grocery store. There would be much potential to decrease the trips taken by private cars if there were easy solutions to share the private cars, to have more passengers in a car, and choose public transportation, bicycles or walking instead.

These results reveal a substantial energy saving potential in private transportation. This potential is supported by Figure FI26, which indicates that 95% of the respondents have never tried car-sharing, but a total of 41% are interested. Only 0.7% have tried car-sharing but did not like it.

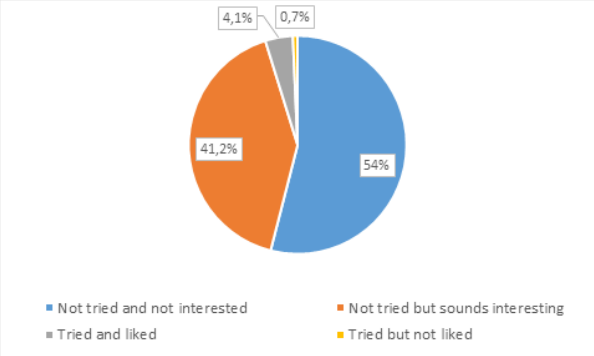


Figure FI26: Car sharing

Bicycle use is another important domain of private transportation. Figure FI27 reveals that "only" 39% of the respondents almost never cycle to work or to shops, i.e., around 61% cycle somewhat regularly to work and to shopping, with 10% usually cycling for these purposes all year long. While for many of these 39% it might be implausible to use a bike due to distances involved, the 61% indicate that it is possible for a large share of the respondents, highlighting the potential for improvements. In the study conducted in Lahti in 2019-2020, the results showed that in summer, 15% of respondent's main transport mode to the grocery store was bicycle or roller skates, etc. In winter, it was only 4%.

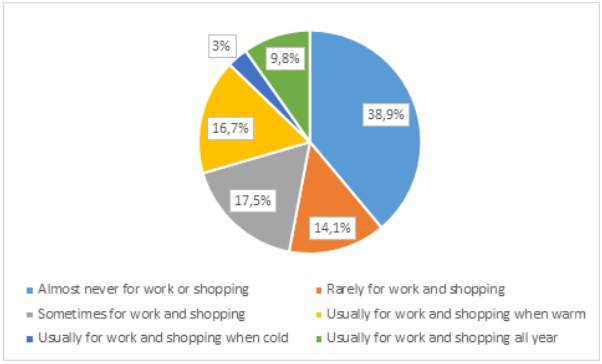


Figure FI27: Bicycle use

Electric bicycles might offer a possible option for many. Figure FI28 shows that 14% agree that they intend to purchase an electric bicycle within the next five years and another 16% are undecided. However, 69% disagree. Since only 1.5% own an electric bicycle, an uptake of this rate might offer a possibility to decrease distances driven by car and increase the usage of bicycles for work and shopping. In the ECHOES survey, 62% neither disagree nor agree that people in their municipality would support purchasing an electric bicycle and 30% agree that a growing number of people in their municipality will buy an electric bicycle within the next five years.

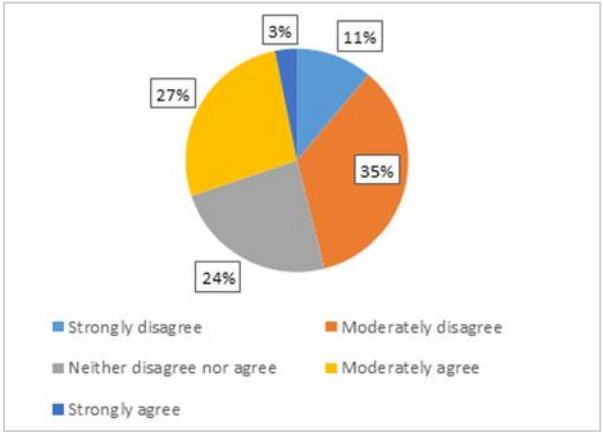


Figure FI28: Electric bicycle (Lahti)

According to the results, people see that some people would be buying more electric bicycles in the future, but not really seeing support from other people to do that. Strong opinion is that many do not see a need to buy an electric bicycle by themselves soon (see Figure FI29).

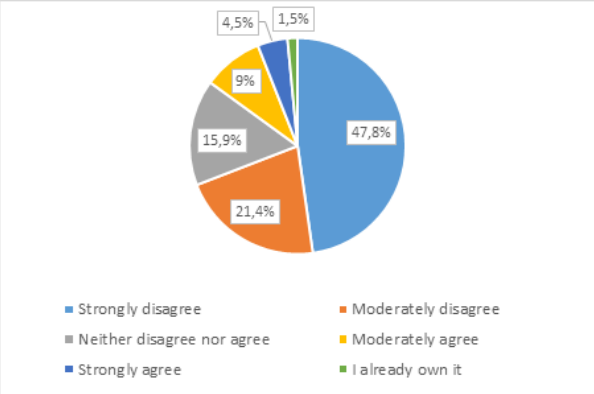


Figure FI29: Electric bicycle

A large part of energy-lifestyle is related decisions at made at home. The most common type of house among the respondents is a flat in an apartment house with more than 10 dwellings (42%) as 30% live in a single-family home (see Figure FI30).

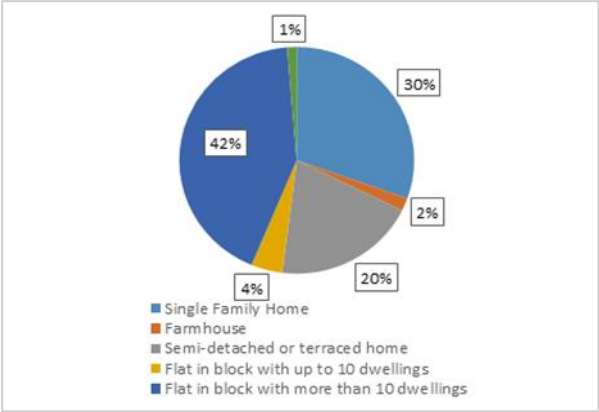


Figure FI30: Type of housing

54% are living in a household with more than 70 m^2 indoor living space. 57% of houses were built in 1961-2000. As shown in FI31, 48% moderately agree and 13% strongly agree that decreasing their energy consumption for heating and cooling their dwelling would benefit the energy transition.

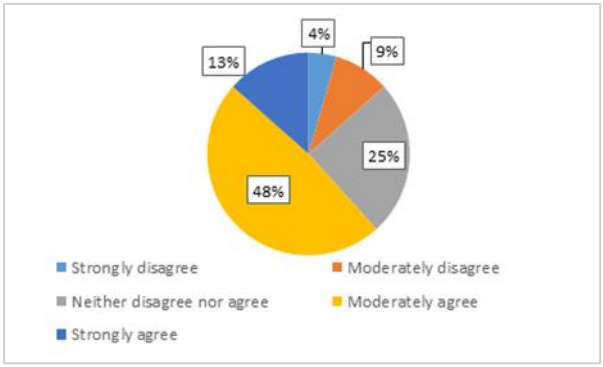


Figure FI31: Opinion of respondents whether they think that decreasing their energy consumption for heating and cooling of their dwelling would benefit the energy transition (Lahti)

42% moderately agree and 31% strongly agree that they feel a personal obligation to be energy efficient as demonstrated in FI32.

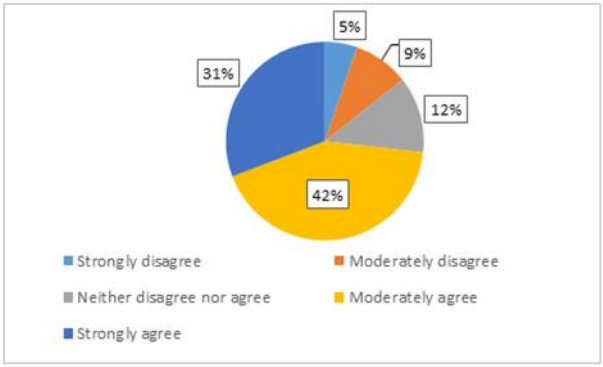


Figure FI32: The opinion of feeling a personal obligation to be energy efficient

48% moderately agree that they feel a personal obligation to decrease their current consumption for heating and cooling their dwelling (Figure FI33). These results show a wide acceptance in being energy efficient and decreasing the energy consumption of dwellings.

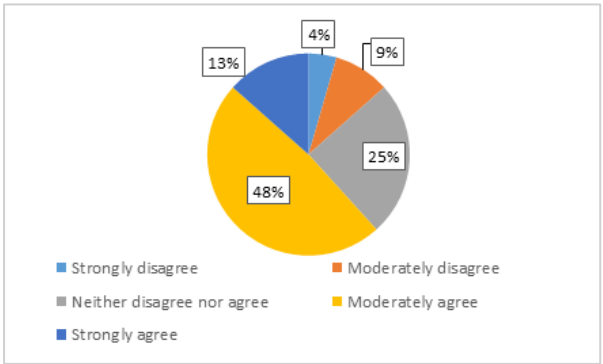


Figure FI33: Opinion of respondents whether they think that decreasing their energy consumption for heating and cooling of their dwelling would benefit the energy transition

Following figures (Figures FI34-FI37) present four important issues. Regarding heating, only 28% of the respondents have central heating for the whole dwelling and have 45% district heating for several houses. The remaining answers involve stoves, electric heaters or lack of awareness of the type of heating system. Regarding air conditioners, with 69%, the majority does not own one, and about 5% use it regularly or often. The savings potential seems rather small in this case. 46% think that their preferred room temperature setting compared to other people is about average and 31% think that it is slightly cooler. Many think that they are already living in cooler apartments than others.

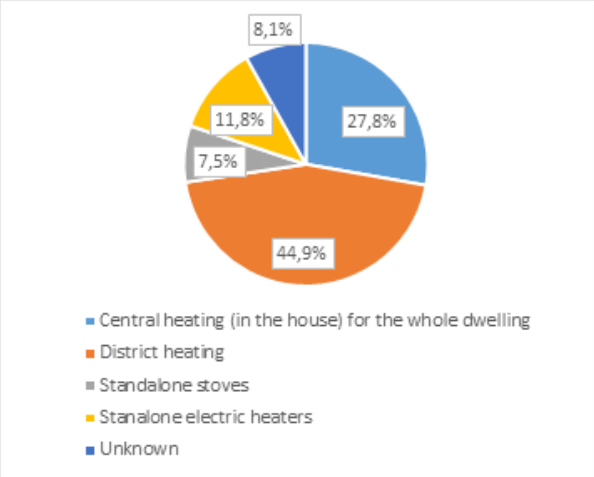


Figure FI34: Heating

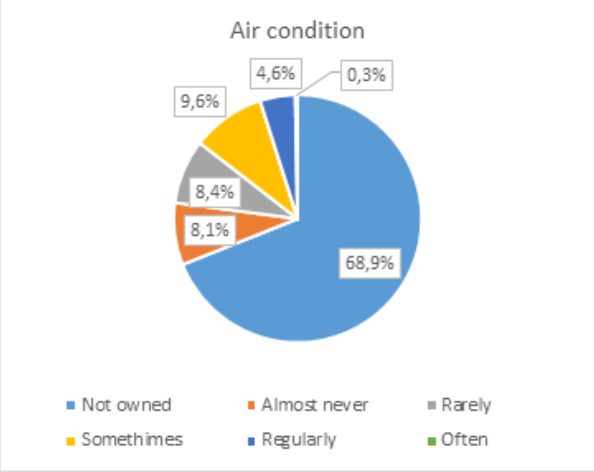


Figure FI35: Air condition use

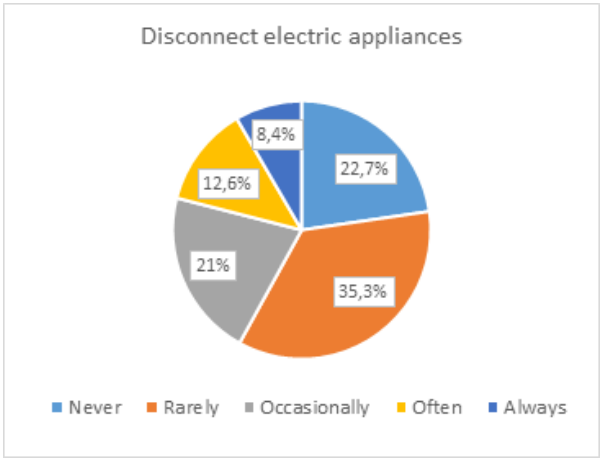


Figure FI36: Disconnect electric appliances

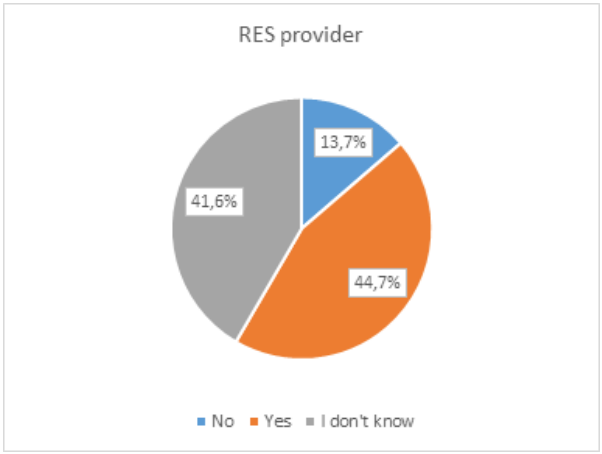


Figure FI37: Purchase electricity from green provider

In the specified study conducted in Lahti in 2016, respondents lived in detached houses. The most common heating system was electricity (76%) with the support of wood in approximately 80% of the houses, and/or air source heat pumps in half of the houses. Other primary heating fuels were oil in 8% of the houses, geothermal energy in 7% of the houses, and wood, pellets, or other.

In the ECHOES survey, 69% answered that energy efficiency renovations have not been made in their dwelling. 14% have had outside walls insulation renovation, 15% have had roof insulation renovation, 8% have had cellar ceiling insulations, 27% have had windows retrofitted and 14% have had top floor ceiling insulation. 30% do not know about their renovation. 46% answered that most (around 75%) of their light bulbs at home are

energy saving varieties. Many say that there have not been renovations so there is much potential for energy renovations. Many do not know about the renovation situation which shows the need for awareness raising of different renovation methods and their environmental and economic effects.

Considering respondents' diets, 39% eat meat in most meals and 37% eat meat in some meals as shown in Figure FI38.

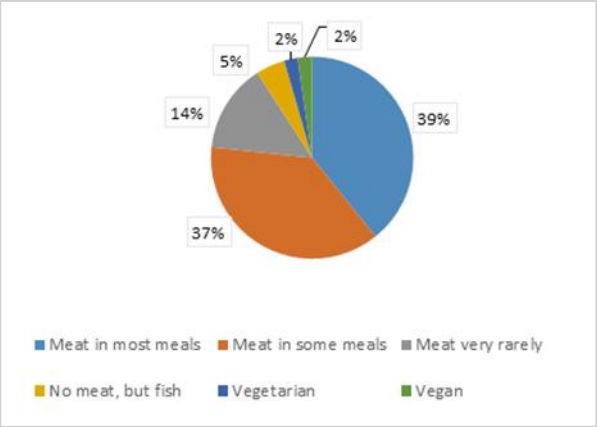


Figure FI38: Respondents' diets

There would be good potential to reduce the use of meat. However, we did not get answers through the survey about the opinions on meat eating.

Concerning the heating method of hot water (see Figure FI39), 24% answered that they do not know how hot water is provided in their home, therefore there is a need for awareness raising in the environmental effect of warm water heating and use. 31% answer it is provided by district heating and 30% with electricity. 91% have no bathtub so it is not common in Finland.

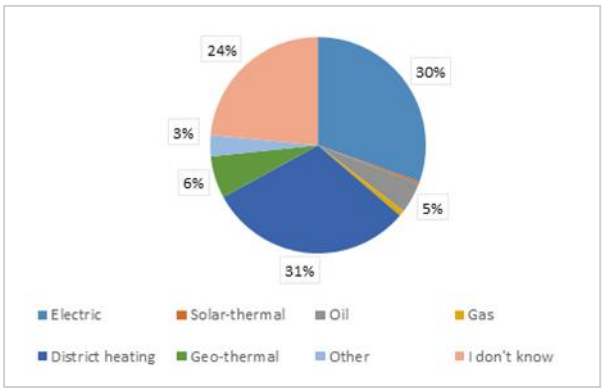


Figure FI39: Heating method of hot water

33% use little equipment and infrastructure and 30% use moderate amounts of equipment and infrastructure in their hobbies and leisure activities (see Figure FI40).

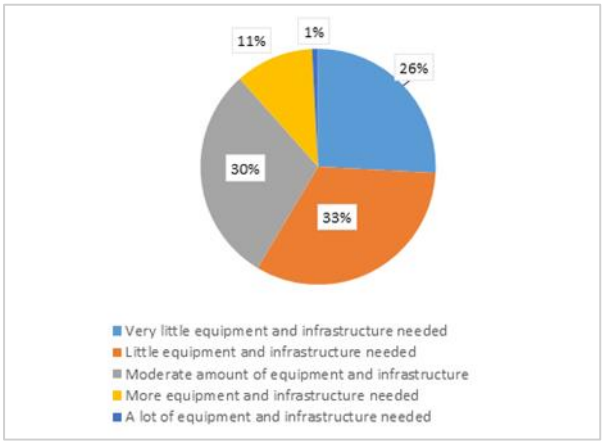


Figure FI40: Respondents' preferences in hobbies

Concerning fashion preferences, 40% answered that their preferences in fashion are at average level and 39% answered they wear clothes for a long time and use second-hand clothes as shown in Figure FI41.

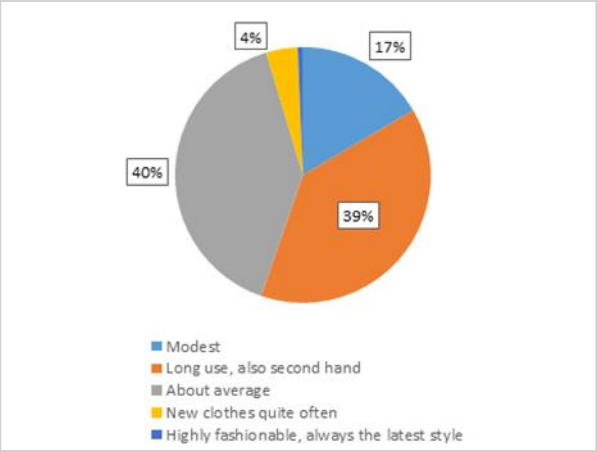


Figure FI41: Respondents' preferences in fashion

Little equipment is needed for the hobbies and fashion preferences are on average level for the respondents. It could be valuable to find out more precisely what people think that is the average level, and how it is compared to the sustainable level and if there would be potential to reduce the use of equipment and fashion finding out new possibilities.

65% answered that they use electronics for a long time and replace them only if they are broken. 40% answered that they use their private electronics on average. The same thing with electronics as with clothes and hobby equipment could be useful – to identify what is the thought average level and how it is compared to what would be the sustainable level on the climate perspective.

Only 21% often or always disconnect electric appliances when not in use, i.e., 79% frequently do not unplug appliances, including 23% that never do. This might offer a substantial and easy-to-implement opportunity for many households to save energy and money without loss of comfort. Lastly, when asked whether respondents purchase electricity from a provider with a particularly high share of renewable energy production, 45% answer Yes and 14% No, i.e., 42% do not know whether their electricity provider has a larger share of renewables. A certain proportion of customers might switch to a provider with a higher share of renewables when better informed.

In the specific study conducted in Lahti in 2016, most of the respondents put emphasis on price (55%) or locality (30%) when choosing an electricity contract. Only 6% of the respondents chose the electricity contract for its environmental friendliness. Most of the respondents turn off lights and computers when not needed. 95% of the respondents usually or always turn off lights when not needed. Approximately 70% of the respondents usually or always turn off the off the computer instead of putting it on standby when not in use.

Among the respondents in Finland, 43% answered that their relationship with the natural environment is on average level, and 34% on moderately close level (see Figure FI42).

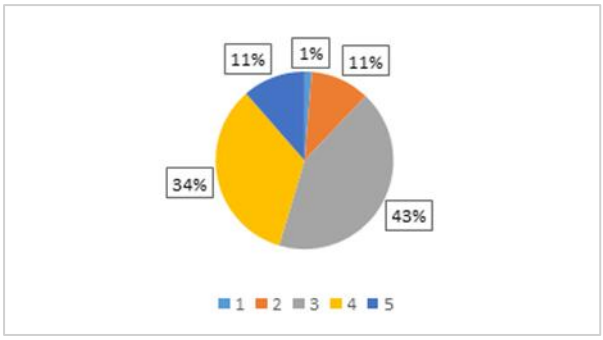


Figure FI42: Relationship with the natural environment on scale 1-5 with 5 being the closest to nature

33% moderately agree and 32% neither disagree nor agree that they behave in a more environmentally friendly way if most other people do as demonstrated in Figure FI42.

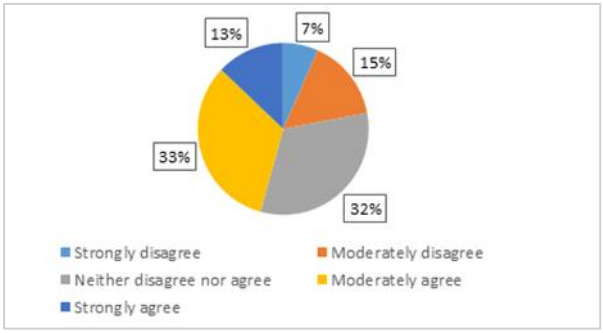


Figure FI43: Opinion of whether respondents behave more environmentally friendly if most other people do so

According to the results, people think that they are acting quite similarly in their relationship with the

nature compared to other people but if others would do more for the environment, then they would do, too.

To sum up, the public transport system is generally accepted, but still offers considerable room for improvement. Two other sources of potential savings are the numbers of people still mainly driving alone in their car, and a considerable but underutilized interest in car-sharing. Bicycle usage seems relatively high. The rare habit of disconnecting of appliances is a potential area for savings. Finally, many respondents are still under-informed about their electricity provider.

4.1.2.5 Interim Conclusion and Suggestions

In terms of age and education, the Finnish sample presents a relatively young and highly educated group with more than 80% living in cities. The results indicate a strong acceptance of human made climate change in our lifetime. Energy policies find a strong acceptance, with higher costs induced by policies seeming to be a significant barrier for acceptance. Renewable energy sources are considered as an influential factor both in an environmental and economic sense. The majority is aware of the importance of both the individual and the group in achieving changes. These attitudes are a solid basis for accepting the need for changes in human actions with a meaningful impact. However, this view is not supported to the same extend with active interest, with only 27% of the respondents considering a real investment in renewable energy.

It seems that more people are reacting positively than negatively to other people's actions, and rather feeling proud than angry about others' energy choices. In addition, the actions of people in their own municipality wake more feelings than the actions of people overall in Finland.

The results show a wide acceptance in being energy efficient and decreasing the energy consumption of dwellings. There is more support for using less energy than for favouring energy policies that support the energy transition. It might be easier to understand how to use less energy than what is meant with the energy reducing policies. The results indicated that people think that other people in their municipality are not as actively saving energy as people overall are saving energy in Finland. There should be encouragement campaigns also on the municipal level for energy saving.

The public transport system is in general accepted; however, most respondents are not convinced of its environmental benefits. This might be one of multiple factors why public transport continues to be underutilized by a large share of respondents. An uptake of public transport utilization could substantially decrease distances driven by car as a driver. Similarly, this could be achieved by a change in individuals' habits of driving alone. In a similar vein, there is a considerable potential in car-sharing, which, depending on the implementation, could also result in shorter distances driven, fewer cars, environmentally friendlier cars, etc. Increasing bicycle usage for work and shopping would not only decrease motorized driven distances and traffic, but also positively affect health and well-being.

Owning private cars is very common in Finland and it is normal to drive alone or just with one other passenger. Electric, hybrid or biogas cars are not yet common. Neither is it common to drive a motorbike or scooter. There would be much potential to decrease the trips taken by private cars if there are easy solutions to share the private cars, to have more passengers in a car and choose public transportation, bicycles or walking instead.

Increasing bicycle usage for work and shopping travels would not only decrease motorized driven kilometres and traffic, but also positively affect

health and well-being. However, bicycle usage is not yet so strong and there is strong disagreement about whether to buy own electric bicycles. Individuals might connect these changes in habits with unreasonable loss of comfort. According to the results, people see that some people would be buying more electric bicycles in the future, but not really seeing support from other people to do that. Strong opinion is that many do not see a need to buy an electric bicycle by themselves in the coming years.

Many respondents feel a personal obligation to support energy transition, but even more are intending to use energy in a way to support a renewable energy system. Many think that they are already living in cooler apartments than others. This awareness raising in what would be a suitable temperature in apartments could also be beneficial.

A large part of respondents would need awareness raising of the environmental effect of different heating fuels. This lack of information might prevent individuals from choosing or supporting the environmentally friendly method for heating and cooling of their dwellings and heating the water. Quite many also answer that there have not been renovations, therefore there is much potential for energy renovations. Many do not know about the renovation situation, which shows the need for awareness raising of different renovation methods and their environmental and economic effects.

The issue of disconnecting appliances concerns approximately 80% of respondents and is an energy and cost saving change that comes with no loss of comfort. Finally, 42% of respondents do not know if their electricity provider has a particularly large share of renewable energy sources, possibly preventing individuals from purchasing their electricity from a greener provider.

The respondents think that they are acting quite similarly in their relationship with nature compared to other people, but if others would do more for the environment, then they would, too.

There would be good potential to reduce the use of meat. However, more details on the respondents' opinions on changing their habits related to meat eating are missing from the survey questions.

Little equipment is needed for the hobbies and fashion preferences for the average respondent. It could be good to find out more precisely, what people think that is the average level and how it is compared to the sustainable level and if there would be potential to reduce the use of equipment and fashion and find out new possibilities. The same thing with electronics as with clothes and hobby equipment could be useful – to identify what is the estimated average level and how it is compared to what would be the sustainable level on the climate perspective.

Based on this assessment, the main policy conclusions are to incentivize citizens to shift from private car users to a more collective transport behaviour with increasing usage of public transportation, increasing cycling and walking, developing car sharing services and encouraging in sharing a car ride. Positive campaigning of environmental and health benefits of cycling is needed. All in all, acceptance of energy efficiency was wide, therefore awareness raising of environmental effects of heating fuels for dwellings and water consumption as well as methods for house renovations would be useful. Many see that if others are doing more, they are more motivated. In addition, pride in other people's environmental actions in their own municipality is seen as an effective motivator.

Based on this assessment, the main policy conclusion is to incentivize citizens to shift from private car users to a more collective transport behaviour with increasing usage of public transportation and car sharing services.

4.1.3 France

4.1.3.1 Demographics

The ECHOES database includes 604 respondents from France. Since there is only one city-specific respondent from Grenoble, the assessment of the ECHOES data is done on the country level.

Of all respondents from France, 51% are male and 57% live in an urban area with more than 10 000 inhabitants. The largest group of respondents are between 18 and 34 years old (35%), approximately 20% fall in each of the remaining three age categories (see Figure FR1).

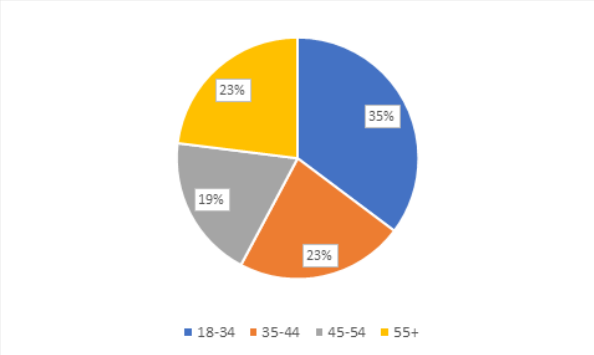


Figure FR1: Respondents by age

73% of the respondents are employed, around 15% are retired, 2%, students and 4%, unemployed. As indicated in Figure FR2, educational attainments in the sample are high, with 58% tertiary education, 20% A-levels (qualification for university) and 18% with a professional training in practical skills, only 3% attained up to secondary education.

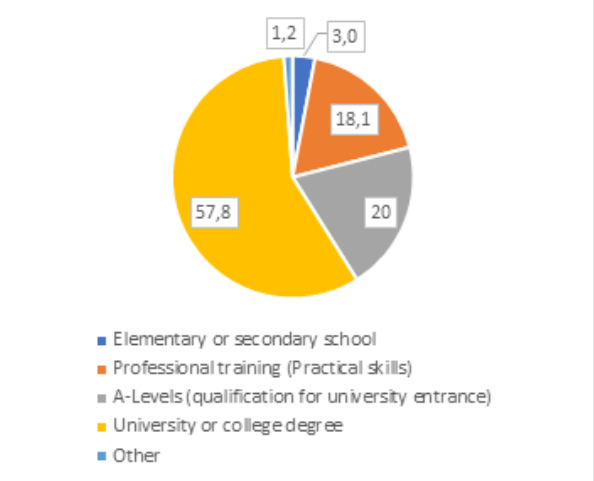


Figure FR2: Respondents by education level

Figure FR3 shows how respondents place themselves on a subjective social ladder, with 1 indicating being at the lowest level, and relatively speaking worst off, and 5 being on at the highest level, and best off. While the vast majority (66%) place themselves in the middle, in total, 84% place themselves in the middle or higher, only 2.5% feel they are socially worst off in the society. All in all, the sample presents a relatively young, highly educated group, living in both urban and rural areas and with a relatively high self-perceived social standing.

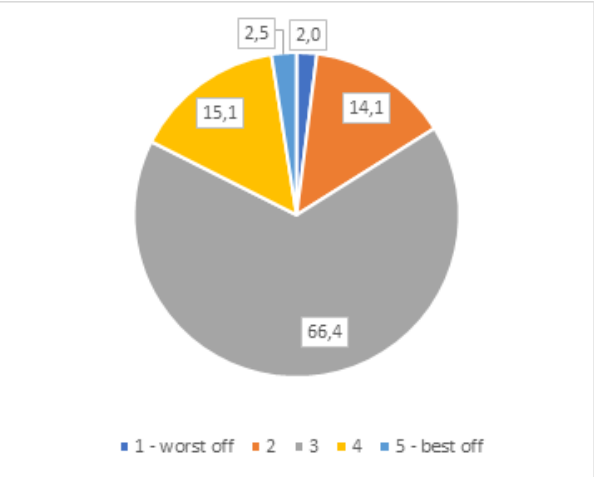


Figure FR3: Respondents by perceived social status

4.1.3.2 Assessment of climate change-related results with respect to themes and subthemes

Two questions directly relate to climate change. As Figure FR4 shows, 44% agree with the statement that the world's temperature has gradually been rising over the past 100 years, as most scientists state, and another 34% think it is likely. Only around 4% (rather) disagree and 18% are not sure.

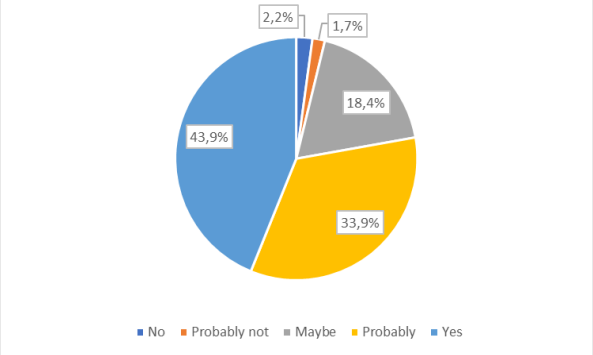


Figure FR4: Climate change

And when asked about the cause of climate change, assuming the temperature is rising, more than half the respondents (63%) think that climate change is mainly caused by human activities and only 8%, that it is mainly due to natural causes (Figure FR5). These results indicate a rather strong acceptance of human made climate change in our lifetime.

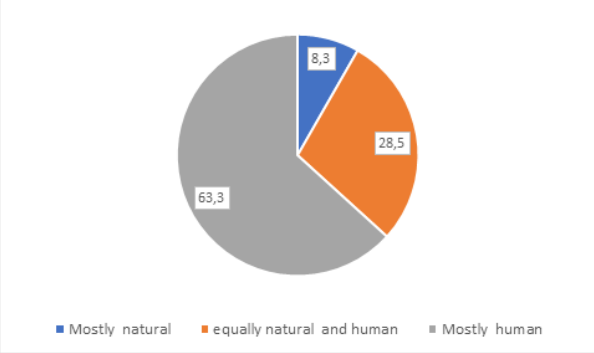


Figure FR5: Cause of climate change

4.1.3.3 Assessment of energy behaviour/attitude related results with respect to themes and subthemes

A considerable section of the ECHOES questions deals with respondents' energy behaviour and their attitudes towards energy related topics. 44% of the respondents strongly agree that the use of more renewable energy sources (RES) will benefit the environment and another 40% agree moderately (Figure FR6). Only around 3% think that using more RES will not benefit the environment.

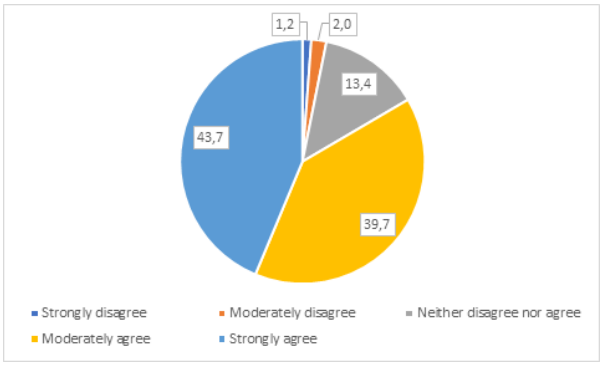


Figure FR6: Renewable energy sources benefit the environment

When stating that the use of more renewable energy sources will create new jobs, 42% agree moderately (Figure FR7). However, only 23% strongly agree and 27% are uncertain. This means that while the respondents are less certain about the creation of new jobs than the benefits for the environment, the majority still agrees with the statement.

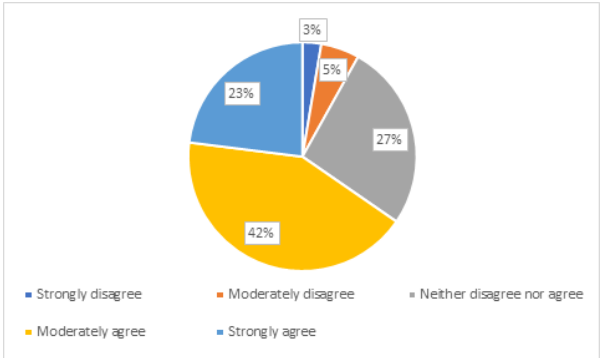


Figure FR7: Q32. Renewable energy sources create new jobs

Questions about energy policies depict somewhat less positive results. Figure FR8 shows the acceptance of energy policies that protect the environment but induce higher costs. 36% of the respondents agree or strongly agree with the statement, one third is undecided and approximately one third disagrees.

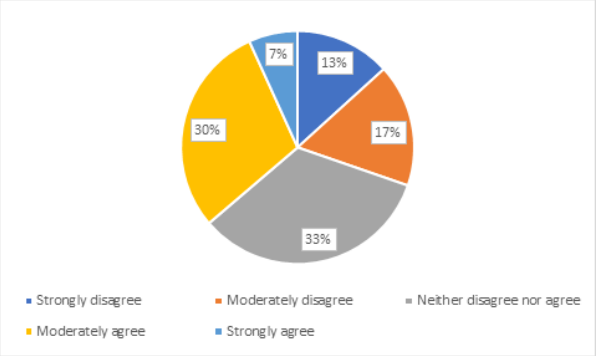


Figure FR8: Policies that protect the environment

Figure FR9 shows the acceptance of energy policies that create new jobs but induce higher costs. The distribution of the answers is slightly more positive that to Figure 4.86. 44% agree with the statement. This indicates that higher costs generally find acceptance, however, in this regard, the creation of new jobs finds more acceptance than the protection of the environment.

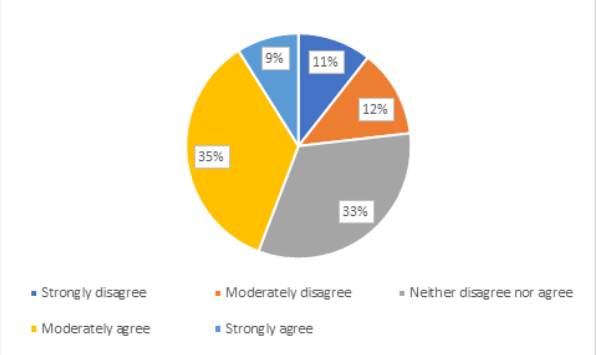


Figure FR9: Policies that create new jobs

These attitudes toward energy topics seem to translate to real action in an expected manner. Respondents were asked whether they were interested in the possibility of a real investment in renewable energy. If so, their email address was to be forwarded to respected companies that offer community-based investments in green power. Further, their email would be used to send them investment opportunities, while respondents could withdraw their confirmation to receive such offers at any time. The results above would suggest that less than half of the respondents might be interested; 37% expressed interested in the possibility of a real investment in renewable energy. To sum up, the sample shows a relatively strong acceptance of the benefits of renewable energy sources and of higher costs induced by energy policies. These attitudes are supported by a relatively strong interest in a real investment in renewable energy.

4.1.3.4 Assessment of lifestyle-related results with respect to themes, subthemes, and focal areas

A central part of the ECHOES database sheds light on lifestyle-related topics and gives valuable insights into energy-related every-day actions and opinions. Figure FR10 reveals that 50% of the respondents agree that each individual can do much to support the energy transition.

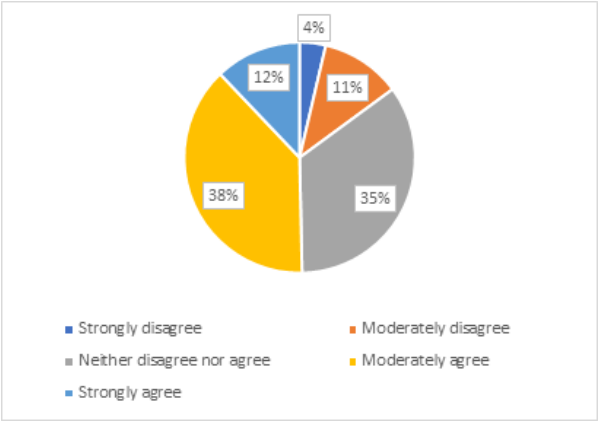


Figure FR10: I can do a lot to support the energy transition.

Further, 67% agree that people can act together to achieve the energy transition, pointing towards the importance of the collective (see Figure FR11).

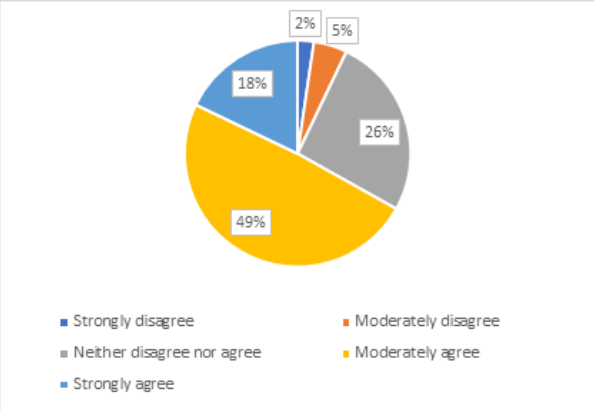


Figure FR11: We as people can act together to achieve the energy transition.

Public and private transport play an important role in the energy-life of individuals. Following figures display various public transportation (PT) related results. As shown in Figure FR12, only 36% of the respondents are satisfied with the local public transportation system while around 26% are dissatisfied. However, this indicator is especially dependent on location and might vary highly within a country.

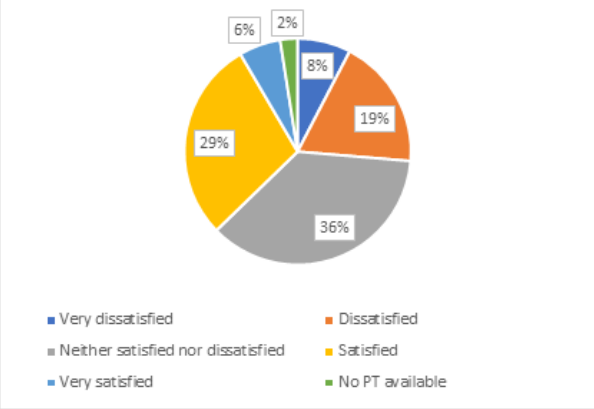


Figure FR12: Satisfaction level of respondents on current public transportation system

Only 22% agree that the local public transportation system is environmentally friendly, 46% are uncertain and 30% disagree as shown in Figure FR13.

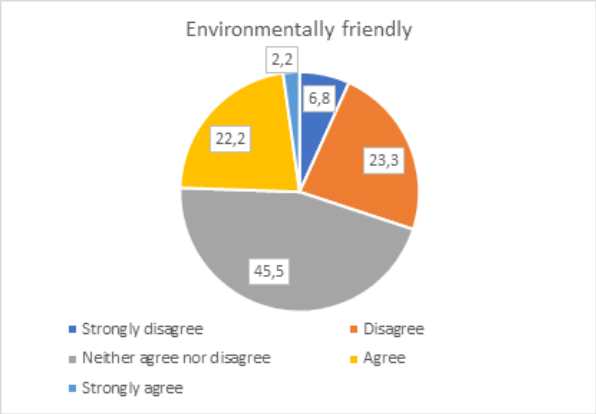


Figure FR13: The public transportation system in my area to be environmentally friendly

As demonstrated in figure FR14, looking at a specific number of trips using public transportation, public transportation does not find the highest acceptance and may be underutilized for that reason. 66% of the respondents rarely use public transport on a weekly basis, even though this indicator includes travels to work or for shopping. Only 5% use it more than 12 times per week. These are likely to be individuals that commute using public transportation.

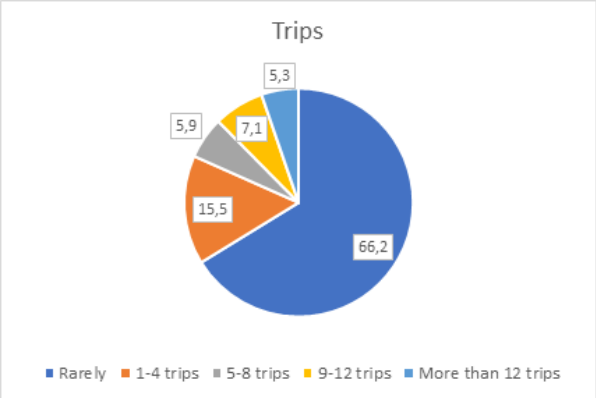


Figure FR14: Trips per week by using public transportation on average

Lastly, the most popular type of public transport seems to be bus, with 27%, followed by train, with 16% and underground, with 19%. However, a large share, 58% of the respondents, do not use any of these routinely (see Figure FR15). Underground transportation in France is relevant in several cities, but not in Grenoble.

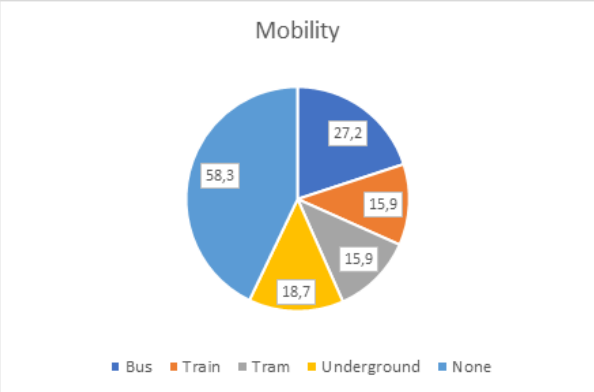


Figure FR15: Type(s) of public transportation use as a part of routine mobility

Regarding private transportation, only 11% do not drive any distance with a car as a driver per year, even though this indicator includes driving to work, etc. Most respondents drive only a limited distance per year, with almost one quarter driving between 1 to 5 thousand kilometres per year. The exact distribution is illustrated in Figure FR16.

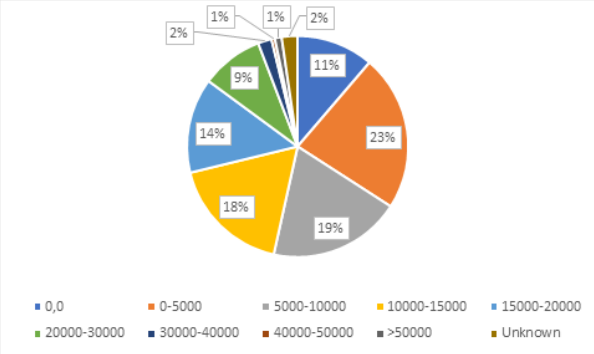


Figure FR16: Kilometres per year

As Figure FR17 shows, driving alone in one's car is a popular choice, one reason might be that this includes commuting. 57% drive alone very often or almost always, and another 20% half of the time. Only 10% almost never drive alone in their car. These results reveal a reasonable possibility for energy saving potential in private transportation.

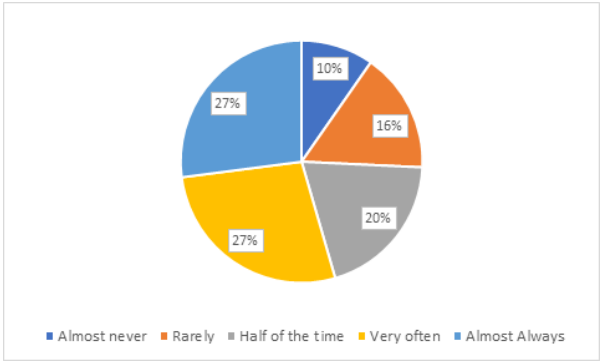


Figure FR17: Driving alone

This potential is supported by Figure FR18, which indicates that 74% of the respondents have never tried car-sharing, but a total of 28% are interested 22% have tried it and liked it and only 4% have tried it but did not like it, which might indicate an already relatively high level of car-sharing.

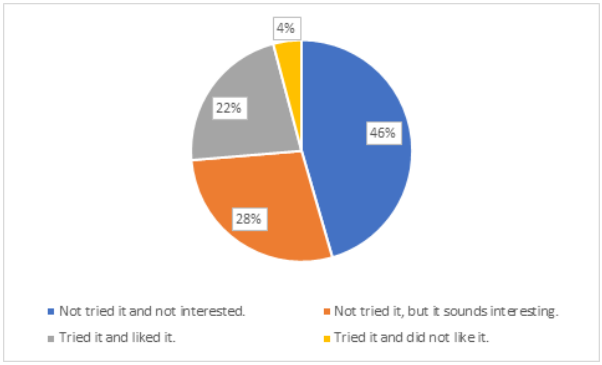


Figure FR18: Car sharing

Bicycle use is another important domain of private transportation. Figure FR19 reveals that 75% of the respondents almost never cycle for work or shopping. This in turn means that only 25% cycle somewhat regularly for work and shopping, with 8% usually cycling for these purposes all year long. While for some of this 75%, it might be implausible to cycle due to distance, for many others, it might be possible. Overall, bicycle usage seems relatively limited and offers space for improvement.

Figure FR19: Bicycle use

Electric bicycles might offer an acceptable option for many. Figure 4.49 shows that 17% agree that they intend to purchase an electric bicycle within the next five years and another 23% are undecided. However, 58% disagree. Since only 2% own an electric bicycle, an uptake of this rate might offer a possibility to decrease distance driven by car and increase the usage of bicycles for work and shopping.

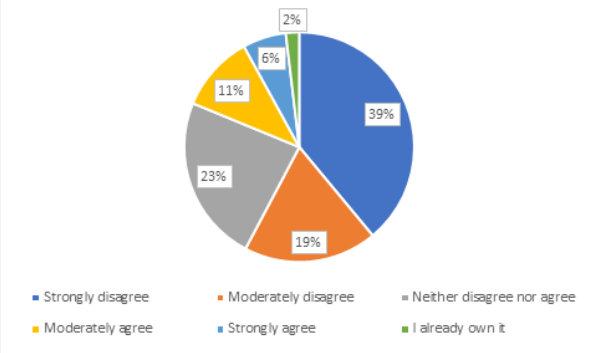


Figure FR20: Electric bicycle

A large part of energy-lifestyle is related to decisions at home. Following figures present four important issues. Regarding heating, 51% of the respondents have a central heating for the whole dwelling and only 9% district heating to multiple houses. 26% use standalone electric heater(s). The remaining answers consist of stoves or the respondents do not know their heating system (see Figure FR21).

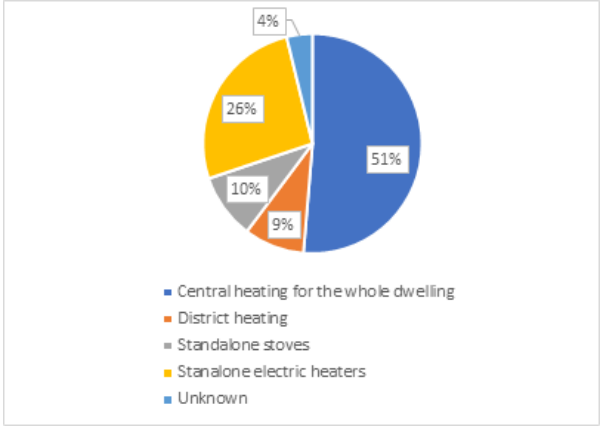


Figure FR21: Heating

Regarding air conditioning, 78%, the majority, does not own an air conditioner and about 5% use it regularly or often. The savings potential seems rather small in this case (see Figure FR22).

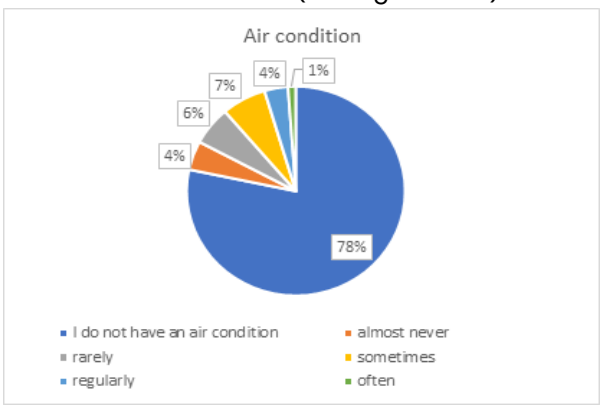


Figure FR22: Air condition use

54% often or always disconnect electric appliances when not in use, i.e., 46% do not do this frequently, including 13% that never do (see Figure FR23). This might offer an acceptable and easy opportunity to implement to save energy and money without loss of comfort for many households.

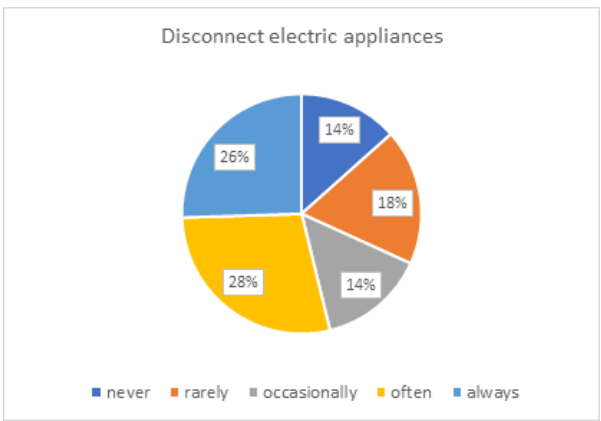


Figure FR23: Disconnect electric appliances

Lastly, when asked whether respondents purchase electricity from a provider with a particularly high share of renewable energy production, only 15% answer Yes and 33% No. This means that 53% do not know whether their electricity provider has a larger share of renewables (see Figure FR24). A certain proportion of customers might switch to a provider with a higher share of renewables when better informed.

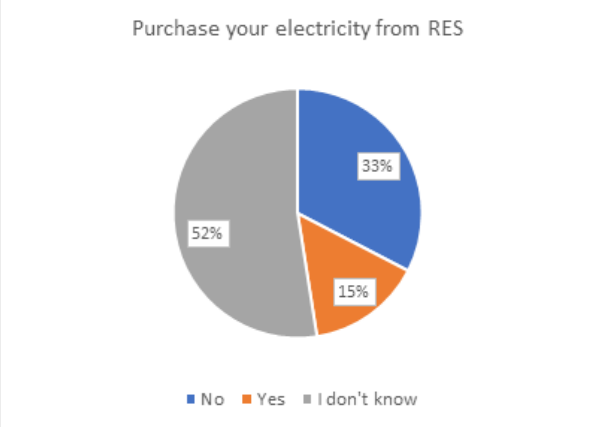


Figure FR24: Purchase electricity from green provider

To sum up, the public transport system finds rather limited acceptance and offers considerable room for improvement. Other sources of potential savings lie in the fact that many continue to mainly drive alone in their car and a considerable but underutilized interest in car-sharing. Bicycle usage seems rather low. Disconnecting appliances is a reasonable issue to build upon. Finally, many respondents are still under-informed about their electricity provider and only a few state to have a provider with a higher share of renewables.

4.1.3.5 Interim Conclusion and Suggestions

In terms of age and education, the French sample presents a relatively young and highly educated group with more than 50% living in cities. The results indicate a rather strong acceptance of human made climate change in our lifetime. Energy policies find relatively strong acceptance and higher costs seem not to be a significant barrier. Renewable energy sources are considered as an influential factor both in an environmental and economic sense. Half of the respondents are aware of the importance of the effect of the individual, and two thirds, of the group in achieving changes. These attitudes are a solid basis for accepting the need and the meaningful impact of changes in human actions. This reasoning is supported as expected by an actual interest of 37% of the respondents in a real investment in renewable energy.

The public transport system does not find the highest level of acceptance and most respondents are not convinced of its environmental benefits. This might be among the multiple factors explaining why public transport continues to be underutilized by a large share of respondents. An uptake of public transport utilization could decrease distances driven by car as a driver substantially. Similarly, this could be achieved by a change in individuals' habits of driving alone. In a similar vein, there is a considerable potential in car-sharing, which, depending on the implementation, could also result in less distances driven, less cars, environmentally friendlier cars, etc. Increasing bicycle usage for work and shopping travels would not only decrease motorized driven distances and traffic, but also positively affect health and well-being. Bicycle usage is indeed relatively smaller. Individuals might connect these changes in habits with unreasonable loss of comfort. The issue of disconnecting appliances concerns approximately 46% of respondents, demonstrating a significant opportunity for energy saving. Finally, 53% of respondents do not know if their electricity provider has a particularly large share of renewable energy sources, which might prevent individuals from purchasing their electricity from a greener provider. Based on this assessment, the main policy conclusion is to incentivize citizens to shift from private car users to a more collective transport behaviour with increasing usage of public transportation and car

sharing services. However, it seems that the local public transport options should be made more attractive.

4.1.4 Greece with a focus on Dafni Network and Skopelos

4.1.4.1 Demographics

The ECHOES database includes 604 respondents from Greece. Due to the very limited number of region-specific respondents, the assessment of the ECHOES data is done on the country level.

Of all respondents from Greece, 50% are male and 87% live in an urban area with more than 10 000 inhabitants. The largest group of respondents are between 18 and 34 years old (35%), approximately 20% fall in each of the remaining three age categories (see Figure GR1).

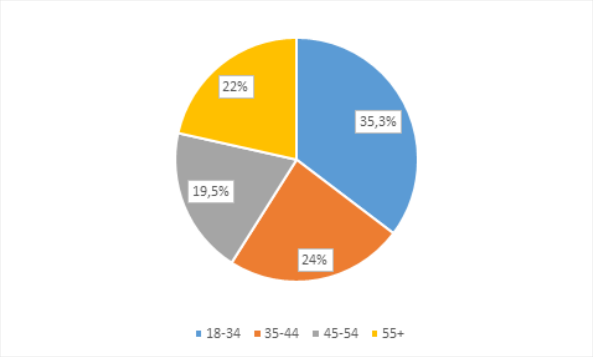


Figure GR1: Respondents by age

62% of the respondents are employed, around 11% are retired, 5% students and 16% unemployed. As indicated in Figure GR2, educational attainments in the sample are extremely high with 61% tertiary education, 19% A-levels (qualification for university) and 7% with a professional training in practical skills, 9% attained up to secondary education.

Figure GR3 shows how respondents place themselves on a subjective social ladder, with 1 indicating being at the lowest level and relatively speaking worst off and 5 being at the highest level and best off. While the majority (61%) place themselves in the middle, in total, 78% place themselves in the middle or higher and only 5% feel they are socially the worst off in the society. All in all, the sample presents a relatively young, highly educated group, living mainly in urban areas and with an average to rather strong self-perceived social standing.

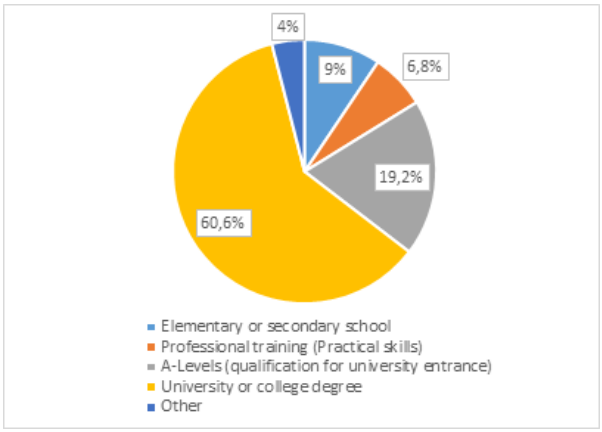


Figure GR2: Respondents by education level

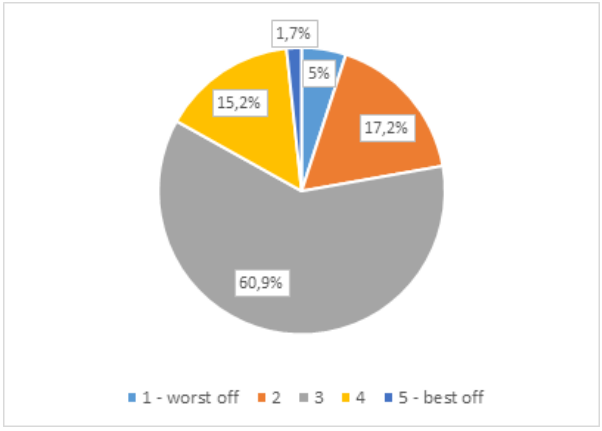


Figure GR3: Respondents by perceived social status

The highest percentage of the respondents is full-time employed, while unemployed is the second most popular response with 16%, similar to the national rate. The high unemployment rate should be considered as people might be less willing to pay for energy transition measures.

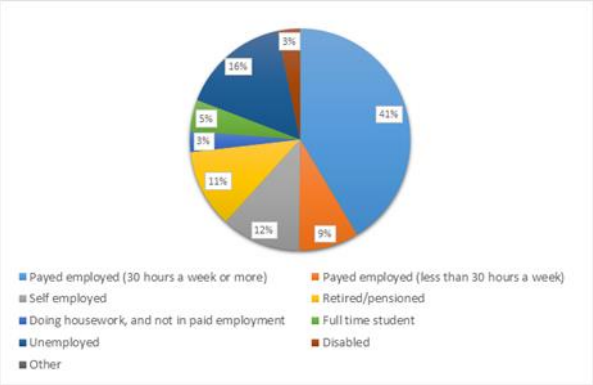


Figure GR4: Type of employment

The vast majority of the respondents in Greece (87%) live in a city or a town. Also, 36% live in the same address for more than 20 years and 22% for 10-20 years. In Greece, according to ECHOES data, a higher percentage of people live for more than 10 years in the same address (58% compared to 53% in total ECHOES responses). That can be explained by the higher than EU average house ownership and that young people leave their parents' house at a later age. That also explains the fact that in 54% of the Greek households there are 3 or 4 people compared to 43% in the total ECHOES data.

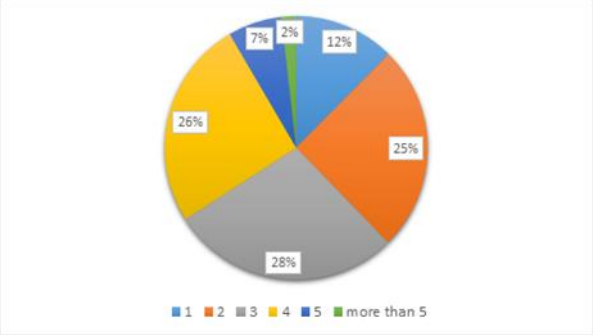


Figure GR5: Number of people living in a household

Respectively Greek households with 1 or 2 people account for 37% compared to 48% of the total data sample. Furthermore, in 44% of the houses there are no children and in 49% lives one or two children (Figure GR5).

4.1.4.2 Assessment of climate change-related results with respect to themes and subthemes

When it comes to global warming, the majority of the respondents i.e., 54% is certain that the phenomenon of global warming is truly happening (Figure GR6) which is 10% more than the ECHOES data and another 28% considers it as the most probable case (6% less than in ECHOES data). That means that the measurement in Greece shows a higher certainty that global warming is happening, among the respondents, as compared to ECHOES average data. Regarding the cause of temperature rising, 68% of Greek respondents believe that it is mainly happening by human activities, 26% temperature rise is due to equally by human activity and natural causes and 6% that temperature rise is due to only natural causes (Figure GR7). The respective percentages in total ECHOES data are 55%, 37% and 8%. Although these results indicate a strong acceptance of human made climate change in our lifetime, there is a clear difference in the Greek sample that 13% people believe that the world's temperature is rising mainly because of human activities. That might be important as such a belief could make it easier to trigger climate friendly behaviours.

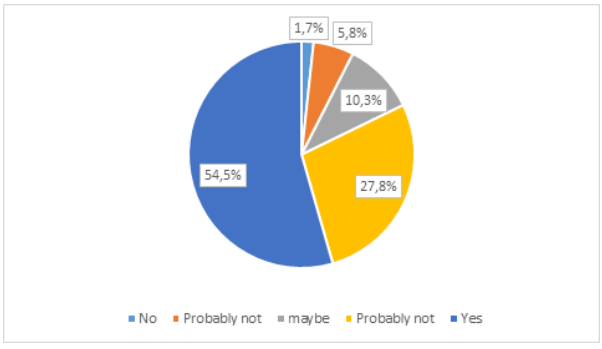


Figure GR6: Global temperature increase

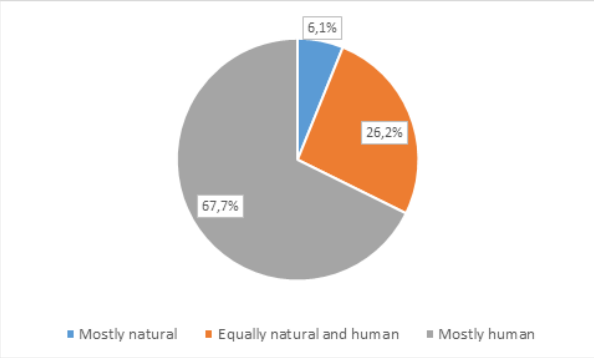


Figure GR7: Cause of climate change

However, when it comes to donating to fight climate change 70% do not want to donate, 19% would donate 1 euro and the rest would donate 2 (3%), 3 (3%), 4 (1%) or 5 (4%) Euros.

As a first remark we could argue that although there is a high level of understanding of climate change and the responsibility of anthropogenic activities, respondents do not seem willing to implement actions that would cost them any money.

4.1.4.3 Assessment of energy behaviour/attitude related results with respect to themes and subthemes

A considerable part of the ECHOES questions deals with respondents' energy behaviour and their attitudes towards energy related topics. A considerable part of the ECHOES questions deals with respondents' energy behaviour and their attitudes towards energy related topics. There is a positive feeling among the majority of the respondents when other people, part of the municipality, country or the EU save energy. Among the respondents, 43% strongly agree and 33% moderately agree that they feel proud when people save energy (Figure GR8).

It is also possible to identify a non-negligible difference in the percentages compared to the general data where only 28% feel very proud while about the same percentage feel relatively proud. When asked about the negative feeling of being angry to people that do not save energy the respondents are presented more moderate. The percentage of strongly agreeing drops to 32% and is shared by the remaining replies, bringing their percentages closer to those of the general ECHOES sample where there is a much smaller decrease, between the two questions, in the two positive responses (4% overall).

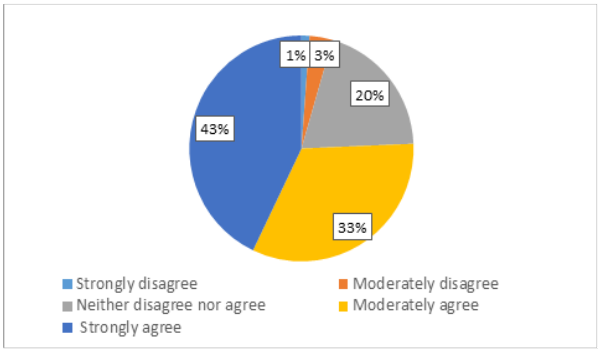


Figure GR8: Feeling proud when others save energy

In the answers to the question if renewables will benefit the environment, there seems to be a contradiction in the responses compared to the previous views already mentioned. Here only 24% of the Greek sample strongly agree, another 29% neither agree nor disagree and 11% moderately disagree, in contrast to the general ECHOES data where 50% strongly agree that renewable energy sources will benefit the environment, 32% moderately agrees, 13% neither agree nor disagree and only 3% moderately disagree. This unexpected shift might be linked to the social acceptance issues that the renewable energy sources are facing in Greece, the NIMBY effect and the belief that renewable energy sources installation and particularly wind energy is taking place without transparency and harming the environment.

24% of the respondents strongly agree that the use of more renewable energy sources (RES) will benefit the environment and another 33% agree moderately (Figure GR9). Around 14% think that using more RES will not benefit the environment and 29% are uncertain.

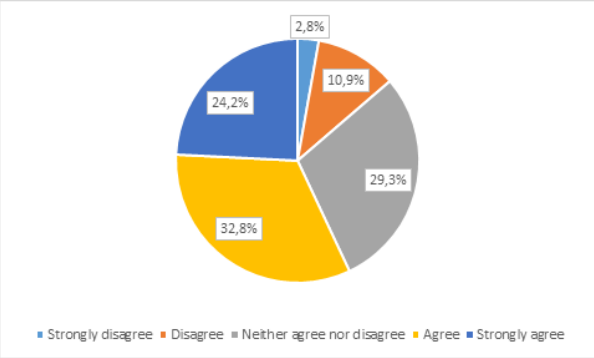


Figure GR9: Renewable energy sources benefit the environment

When stating that the use of more renewable energy sources will create new jobs, 33% agree strongly and another 33% agree moderately (Figure GR10). 29% are uncertain. This means that the respondents are slightly more certain about the creation of new jobs than the benefits for the environment. In total, the respondents agree with the statements, despite much uncertainty.

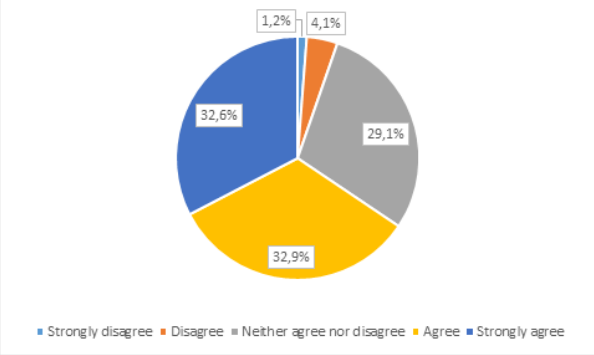


Figure GR10: Renewable energy sources create new jobs

Questions about energy policies depict similar results. Figure GR11 shows the acceptance of energy policies that protect the environment but induce higher costs. 51% of the respondents agree or strongly agree with the statement, one third is undecided and 18% disagree.

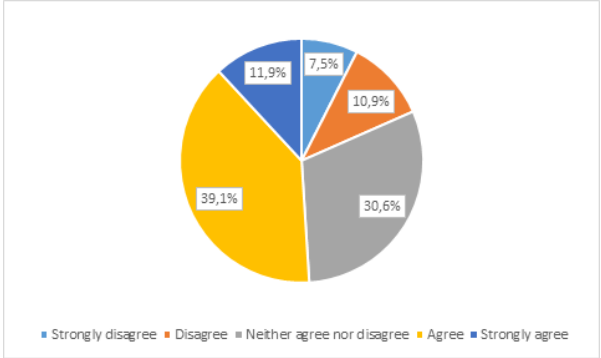


Figure GR11: Support for policies that protect the environment

Figure GR12 shows the acceptance of energy policies that create new jobs but induce higher costs. The distribution of the answers is slightly more positive similar to Figure 4.58. 58% (strongly) agree with the statement. This indicates that higher costs generally find acceptance, however, in this regard, the creation of new jobs finds slightly more acceptance than the protection of the environment. That can be related to the fact that energy transition in Greece will affect the traditional jobs mainly in carbon intensive areas, like lignite mining fields.

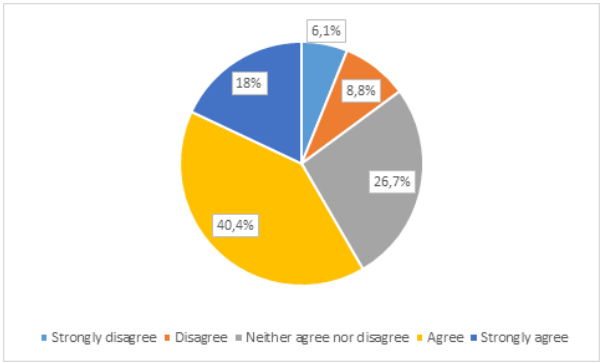


Figure GR12: Policies that create new jobs

In personal energy behaviour and attitudes, we can identify a very clear difference from feeling obliged to support energy transition policies (76% strongly or moderately agrees) to intending to use energy in ways that help the transition (69% strongly or moderately agrees) and to accepting such policies if it means bearing an increased cost (51% strongly or moderately agrees).

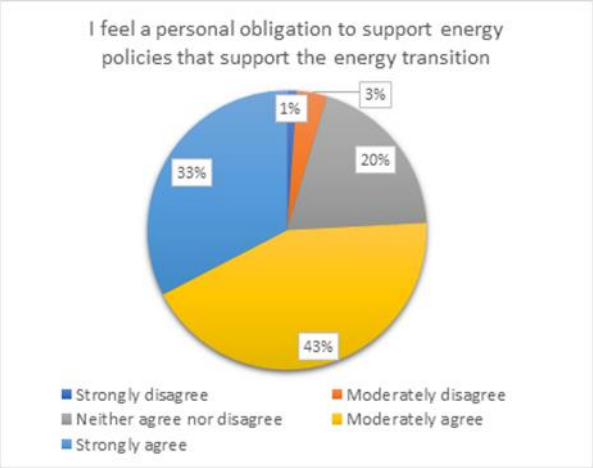


Figure GR13: Personal obligation to support energy transition

Also, the acceptance of higher costs is slightly wider (58%) if it is linked with the creation of new jobs.

Furthermore, 69% are interested in the possibility of investing in renewables through companies that offer community-based investments in green power.

These attitudes toward energy topics seem to translate into real action in an unexpectedly positive manner. Respondents were asked whether they were interested in the possibility of a real investment in renewable energy. If so, their email address was to be forwarded to respected companies that offer community-based investments in green power. Further, their email would be used to send them investment opportunities, while respondents could withdraw their confirmation to receive such offers at any time. The results above would suggest that around half of the respondents might be interested in such an opportunity. However, the results show that, in fact, 69% are interested. To sum up, the sample shows a moderately strong acceptance of the benefits of renewable energy sources and of higher costs induced by energy policies. These attitudes are enhanced by a very strong interest in a real investment in renewable energy.

To sum up, the sample shows a moderately strong acceptance of the benefits of renewable energy sources. However, this acceptance, although steel the majority, is reduced when higher costs are induced by energy policies. Moreover, these attitudes are excelled by a very strong interest in a real investment in renewable energy. It is clear that people are less willing to bear the cost towards the energy transition but are much more open in being part of it by investing and therefore in the possibility of making a profit.

4.1.4.4 Assessment of lifestyle-related results with respect to themes, subthemes, and focal areas

A central part of the ECHOES database sheds light on lifestyle-related topics and gives valuable insights into energy-related every-day actions and opinions. Figure GR14 reveals that 65% of the respondents (strongly) agree that each individual can do much to support the energy transition. Further, 67% (strongly) agree that people can act together to achieve the energy transition, revealing an equal importance of the individual and the collective (Figure GR15).

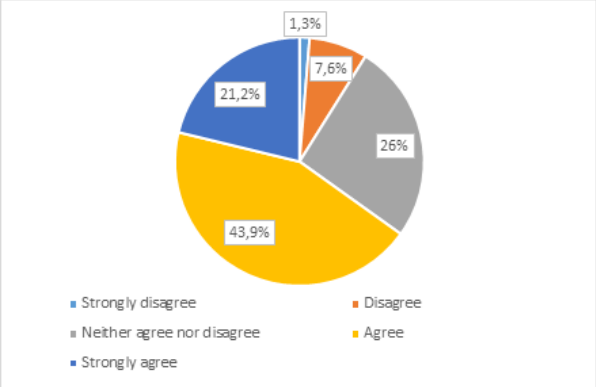


Figure GR14: "I can do a lot to support the energy transition."

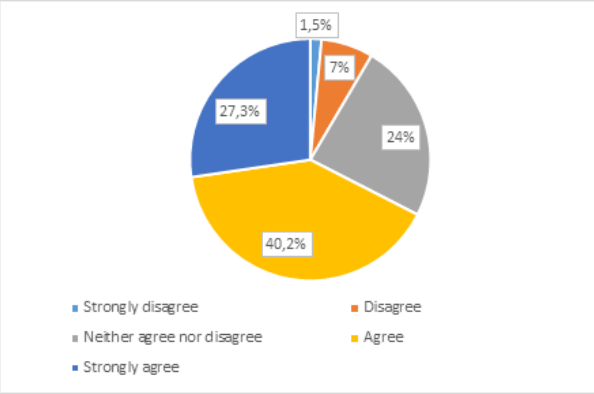


Figure GR15: "We as people can act together to achieve the energy transition."

Public and private transport play an important role in the energy-life of individuals. Figures GR16 to GR19 display various public transportation (PT) related results. Only 20% of the respondents are (very) satisfied with the local public transportation system. Around 45% are (very) dissatisfied (Figure GR16). The negative public perception could be attributed to the generally old public transport system of the cities. Furthermore, in smaller places i.e., islands the public transport is usually even less adequate. Only 10% (strongly) agree that the public transportation system in their area is environmentally friendly. 30% are uncertain and a majority of 60% (strongly) disagrees (Figure GR17).

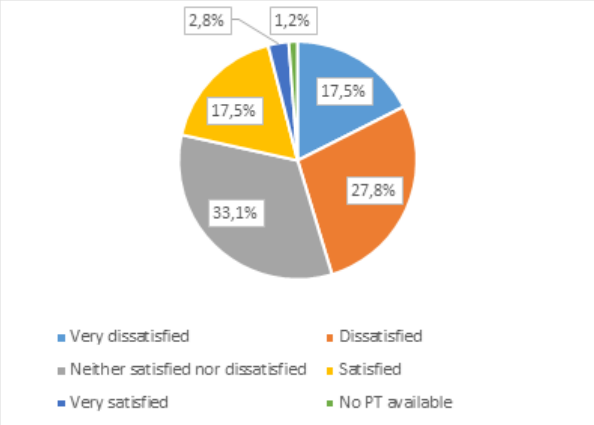


Figure GR16: Satisfaction with the public transportation system

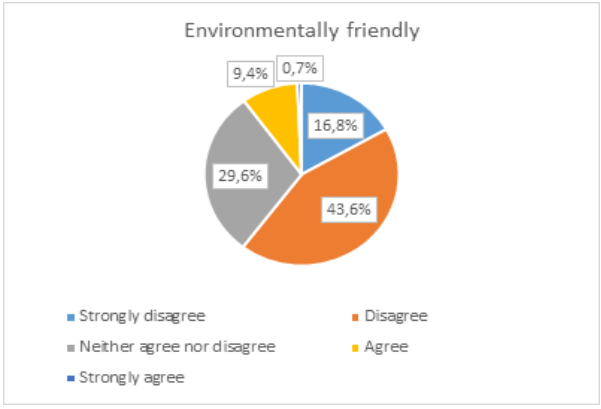


Figure GR17: Perception on whether the public transportation system is environmentally friendly

Regarding the specific number of trips using public transportation, public transportation is not well accepted, but nevertheless seems relatively well utilized. 44% of the respondents rarely use public transport on a weekly basis, even though this indicator includes travels to work or for shopping. 11% use it more than 12 times per week. These are likely to be individuals that commute using public transportation. 24% use it 1-4 times per week. Lastly, the most popular type of public transport is clearly bus, with 63%, followed by underground with 32% and train with 22%. Only a smaller share, 18%, of the respondents do not use any of these routinely (Figures GR 18-19). Underground transportation in Greece is only relevant in Athens, but not in Skopelos or the DAFNI Islands.

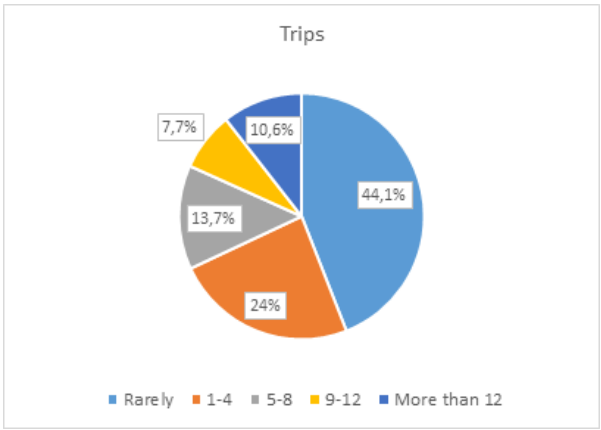


Figure GR18: Trips per week by using public transportation on average

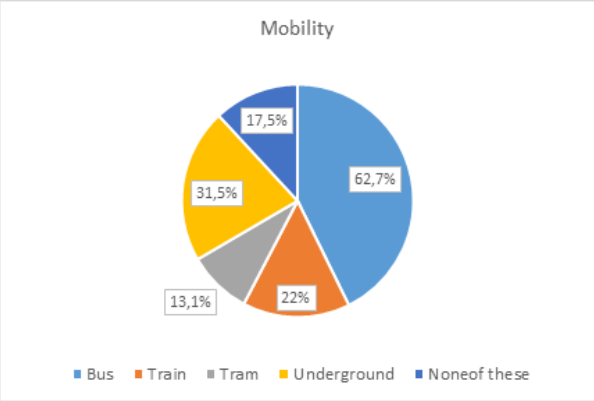


Figure GR19: Type(s) of public transportation use as a part of routine mobility

Regarding private transportation, only 14% do not drive any kilometres with a car as a driver per year, even though this indicator includes driving to work, etc. Most respondents drive only a limited amount of kms per year, with almost one quarter driving between 5 to 10 thousand kilometres per year. The exact distribution is illustrated in Figure GR20.

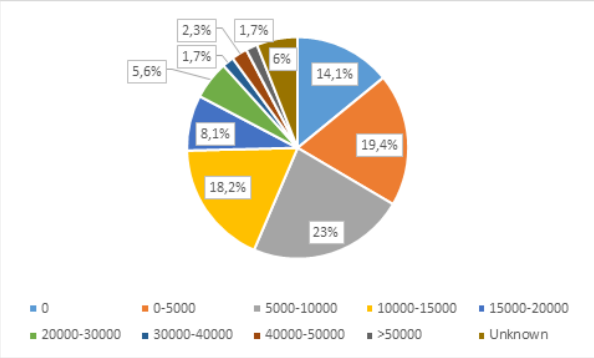


Figure GR20: Kilometres per year with private transportation

As Figure GR21 shows, driving alone in one's car is a rather popular choice, one reason might be that this includes commuting. 41% drive alone very often or almost always and another 24% half of the time. However, 35% almost never or rarely drive alone in their car. These results still reveal a reasonable possibility for energy saving potential in private transportation.

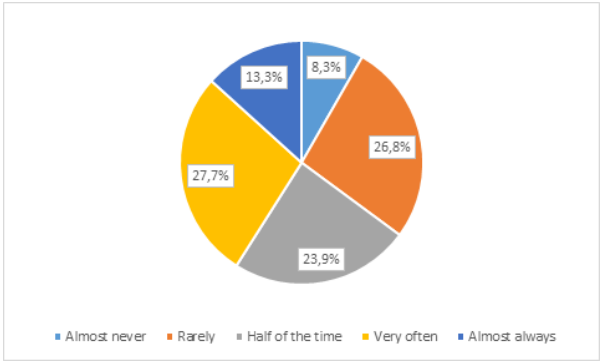


Figure GR21: Frequency of driving alone

This potential is supported by Figure GR22, which indicates that 92% of the respondents have never tried car-sharing, but a total of 53% are interested in the possibility. 7% have tried it and liked it and only 0.7% have tried it but did not like it, which might indicate an already relatively high level of car-sharing.

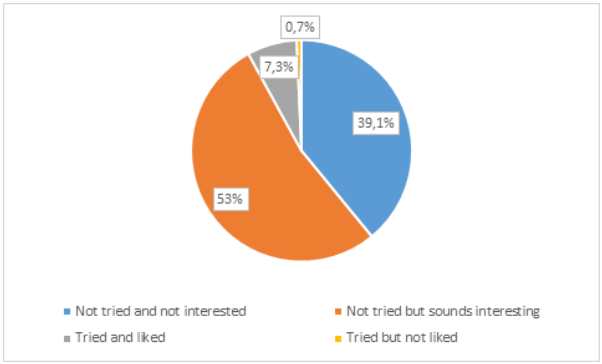


Figure GR22: Car sharing

Bicycle use is another important domain of private transportation. Figure GR23 reveals that 64% of the respondents almost never use their bicycle to go to work or to do shopping. This in turn means that only 36% use their bicycle somewhat regularly for work and shopping, with only 4% usually using a bicycle for work and shopping all year long. While for many of these 64% it might be implausible to use a bicycle due to larger distances, for many it might be possible. Overall, bicycle usage seems moderate and offers lots of space for improvement.

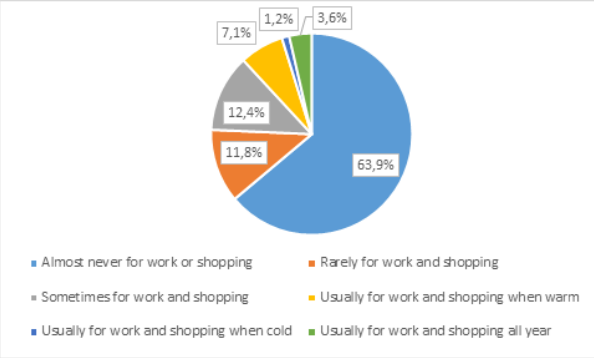


Figure GR23: Bicycle use

Electric bicycles might offer an acceptable option for many. Figure GR24 shows that 21% strongly agree that they intend to purchase an electric bicycle within the next five years and another 31% are undecided. This means 27% strongly disagree. Since only 2% own an electric bicycle, an uptake of this rate might offer a possibility to decrease distances driven by car and increase the usage of bicycles for work and shopping travels. Around 40% of the Greek respondents believe that they would have the support of the others if they purchased an electric bicycle and that such bicycles will be more popular the next 5 years in their municipality, country and the EU. Regarding the personal views 24% strongly and 18% moderately agree in feeling obliged to buy an e-bicycle (10% more than the average of all respondents in the ECHOES survey) moreover only 8% strongly and 13% moderately disagrees compared to 26% and 17% in ECHOES data. In the same direction, it appears that buying an electric bicycle would make very (18%) and mainly (33%) proud of the majority of the respondents compared to only 8% and 19% in the total ECHOES data. It is clear that there is a positive link between lifestyle and electric bicycle use. However, this positive association may come from the general low use of bicycles in everyday life in Greece. Also, 40% (strongly and moderately agrees) that they intend to buy an electric bicycle in the next 5 years (26% being the average of all respondents in the ECHOES survey) and 2% already own one.

Where there seems to be a higher difference if compared with total ECHOES data is that more respondents are positive that people will buy e-bicycles as soon as the current obstacles will be dealt with. This could be explained as incentives for the purchase of electric bicycles have only recently been introduced and electro mobility in general is not yet widely spread in the country. It seems that actions related with electric bicycles would appeal to a considerable proportion of the population. However, a lifestyle change should take place as the majority does not have bicycle use as a regular habit.

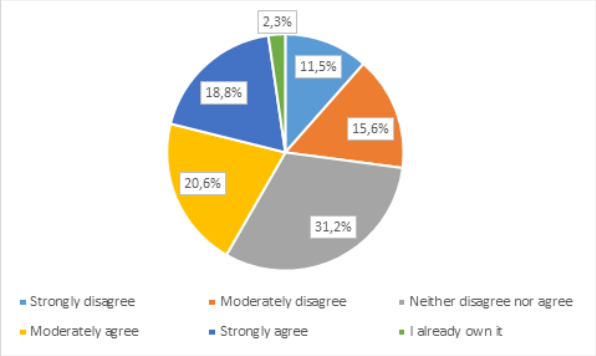


Figure GR24: Electric bicycle

A large part of energy-lifestyle is related to decisions at the own home. An important amount in energy consumption comes from dwellings and so their characteristics as well as the everyday use has a critical role in climate friendly lifestyles. Following figures present four important issues. Regarding heating, 54% of the respondents have central heating for the whole dwelling and 19% district heating to multiple houses. 16% use standalone electric heater(s) (Figure GR25). The remaining answers consist of stoves, or the respondents do not know their heating system. Only a few small cities in the lignite areas of Western Macedonia and Megalopoli that account for a small population percentage actually have district heating. Also, 16% of the houses are heated with standalone electric heaters because many houses especially in the southern parts of Greece where the weather is warmer have no other types of heating.

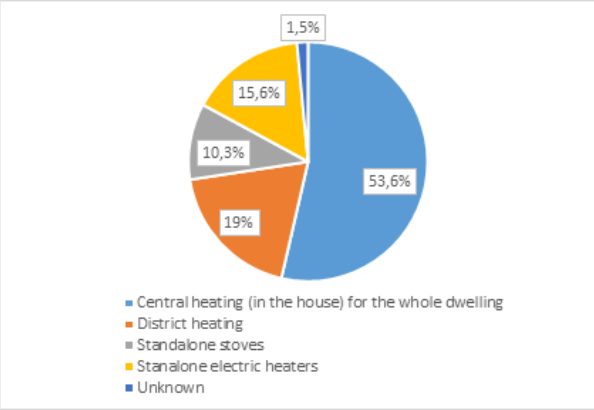


Figure GR25: Heating

Regarding air conditioning, only 19% do not own an air conditioner and about 50% use it sometimes. While the savings potential seems rather large in this case, a change in this regard might be difficult due to the climate in this region (Figure GR26).

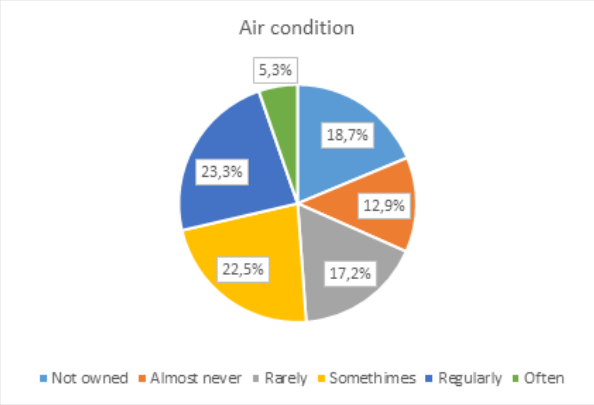


Figure GR26: Frequency of air conditioner use

Only 36% often or always disconnect electric appliances when not in use. This means that 64% do not frequently unplug appliances including 17% that never do. This might offer an acceptable and easy-to-implement opportunity for many households to save energy and money without loss of comfort. In addition, remote switching on and off critical appliances in the houses by the grid operator, does not seem like an action that many people are ready to support. Both the personal questions and the questions relevant with the feeling that respondents have about the others do not present high positive percentages (mainly around 30%). Yet, the positive percentages get slightly higher when offered an annual discount for allowing the grid operator to interfere with the house appliances (15% would definitely and 27% would probably allow it). Lastly, when asked whether respondents purchase electricity from a provider with a particularly high share of renewable energy production, only 24% answer Yes and 27%, No. This means that 50% do not know whether their electricity provider has a larger share of renewables. A certain proportion of customers might switch to a provider with a higher share of renewables when better informed.

To sum up, the public transport system finds only small acceptance and offers considerable room for improvement, even though it does seem relatively well utilized in comparison to the acceptance levels. Two other sources of potential savings lie in the fact that many still mainly drive alone in their car, and a considerable but underutilized interest in car-sharing. Bicycle usage seems moderate. Disconnecting appliances is a reasonable issue to build upon. Finally, many respondents are still under-informed about their electricity provider and only a few states to have a provider with a higher share of renewables.

4.1.4.5 Interim Conclusion and Suggestions

In terms of age and education, the Greek sample presents a relatively young and highly educated group with more than 87% living in cities. The results indicate a strong acceptance of a human made climate change in our lifetime. Energy policies find only a moderately strong acceptance and higher costs seem to be at least a barrier to consider. Renewable energy sources are considered as a relatively influential factor both in an environmental and economic sense. Two thirds of the respondents are aware of the importance of the individual and also two thirds of the group in achieving changes. These attitudes are a relatively sound basis for accepting the need and the meaningful impact of changes in human actions. However, this reasoning is unexpectedly exceeded by an actual interest of 69% of the

respondents in a real investment in renewable energy.

The public transport system does not find a high level of acceptance and most respondents are not convinced of its environmental benefits. However, in comparison, public transport seems relatively well utilized by a large share of respondents. Nevertheless, an uptake of public transport utilization could decrease distances driven by car as driver substantially. Similarly, this could be achieved by a change in individuals' habits of driving alone. In a similar vein, there is a considerable potential in car-sharing, which, depending on the implementation, could also result in less kilometres driven, less cars, environmentally friendlier cars, etc. Increasing bicycle usage for work and shopping travels would not only decrease motorized driven distances and traffic, but also positively affect health and well-being. Bicycle usage is indeed rather weak. Individuals might connect these changes in habits with unreasonable loss of comfort. The issue of disconnecting appliances concerns approximately 64% of respondents and is an energy and cost saving change that comes with no loss of comfort. Finally, 50% of respondents do not know if their electricity provider has a particularly large share of renewable energy sources. This lack of information might prevent individuals from purchasing their electricity from a greener provider.

The extended use of A/C seems to be rather difficult to be reduced due to the warm climate, however an energy and cost saving measure that has great potential is the disconnection of appliances, even remotely by the electricity provider if incentives were introduced. The introduction of heat pumps and energy efficiency upgrades in buildings could also be considered as parallel measures to be implemented.

Finally, informing consumers about the energy mix of electricity suppliers and their ability to switch suppliers would have a positive impact. Based on this assessment, the areas on which policies should focus is to make public transport more attractive and promote bicycle use among commuters. Furthermore, to better inform about the potential environmental benefits of specific action such as the choice of a greener energy provider. Lastly, to include individuals in the energy transition of their areas by giving them the possibility to invest in it, possibly by promoting participation in energy communities.

Based on this assessment, the main policy conclusion is to make public transport more attractive and inform about potential environmental benefits. The strong interest in real investment in renewables is an important factor to consider as well.

4.1.5 Ireland with a focus on Dublin

4.1.5.1 Demographics

The ECHOES database includes 624 respondents from Ireland. Due to the small number of city specific respondents, the assessment of the ECHOES data is done on the country level.

Of all respondents from Ireland, 50% are male and 64% live in an urban area, namely a town or city with more than 10 000 inhabitants. Most of the respondents are between 18 and 34 years old (35%), approximately 20% fall in each of the remaining three age categories (see Figure IR1).

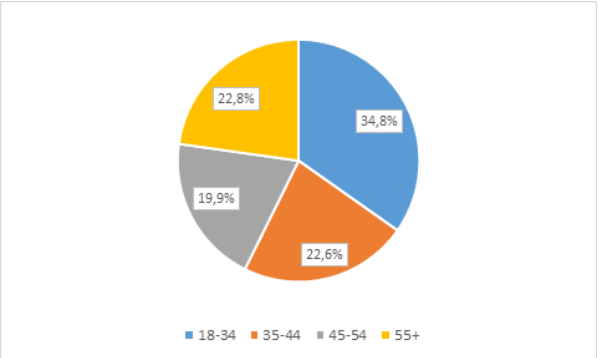


Figure IR1: Respondents by age

72% of the respondents are employed, around 11% are retired, 4% students and 4% unemployed. For Dublin, the figures show a higher rate of employment. A total 77% of the respondents were in paid employment (including either full-time, part-time or self-employment), approximately 9% were retired or pensioned, 5% students and 6% unemployed. As indicated in Figure IR2, educational attainments in the sample are very high with 57% tertiary education, 13% A-levels (qualification for university) and 9% with a professional training in practical skills. However, 16% attained up to secondary education.

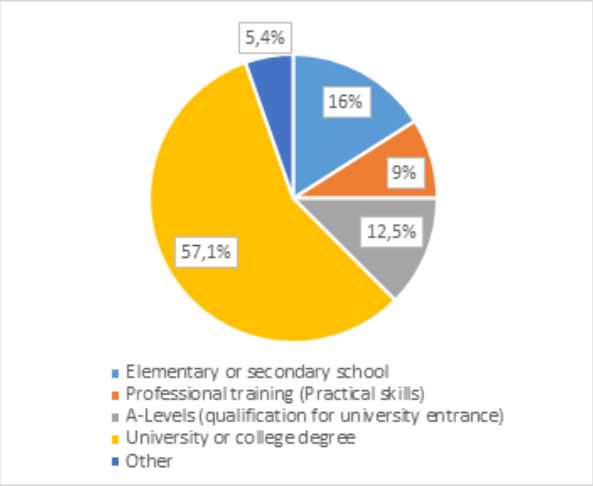


Figure IR2: Respondents by education level (Ireland)

For Dublin, the educational attainments are even higher, with 65% tertiary education, 12% A-levels (qualification for university entrance) and 3.3% with a professional training in practical skills. A further 14% attained up to elementary or secondary education (Figure IR3).

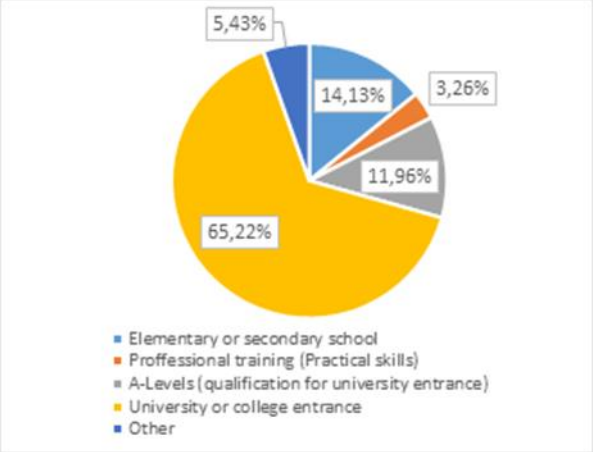


Figure IR3: Respondents by education level (Dublin)

Figure IR4 further shows how respondents place themselves on a subjective social ladder, with 1 indicating being at the lowest level and relatively speaking worst off and 5 being at the highest level and best off. While the vast majority (60%) place themselves in the middle, in total, 84% place themselves in the middle or higher and only 3% feel they are socially worst off in the society. All in all, the sample presents a relatively young, highly educated group from cities as well as less populated areas with a solid self-perceived social standing. The results for Dublin are similar.

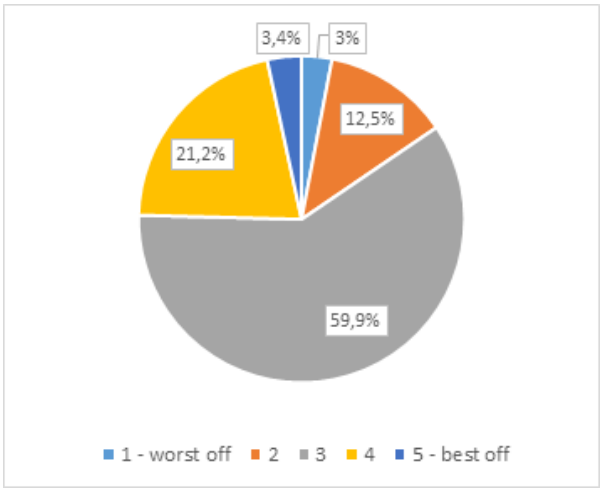


Figure IR4: Respondents by perceived social status

4.1.5.2 Assessment of climate change-related results with respect to themes and subthemes

Two questions directly relate to climate change. As Figure 4.71 shows, most respondents (82%) agree with the statement that the world's temperature has gradually been rising over the past 100 years, as most scientists state. Only around 5% (rather) disagree and 13% are not sure (Figure IR5).

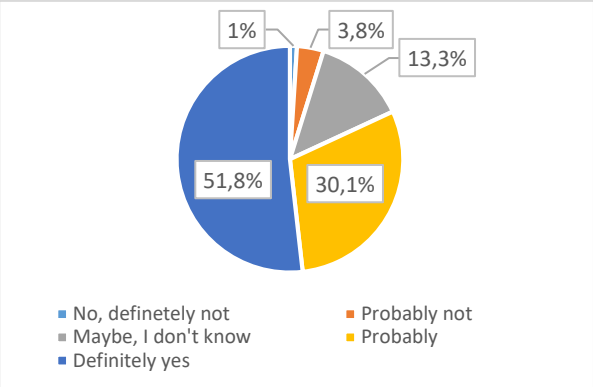


Figure IR5: Belief in climate change (Ireland)

The results for Dublin demonstrate higher (86%) belief in temperature rise (Figure IR6).

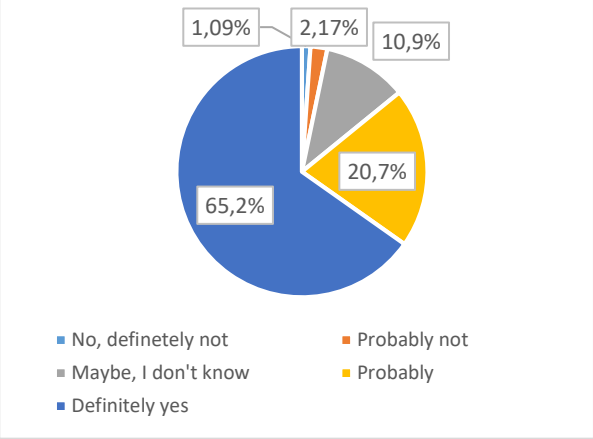


Figure IR6: Belief in climate change (Dublin)

And when asked what the cause of climate change is, assuming the temperature is rising, more than half of the respondents (63%) think that climate change is mainly caused by human activities and only 7%, that it is mainly due to natural causes (Figure IR7).

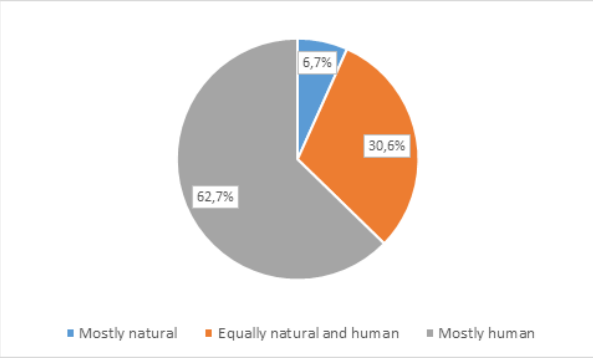


Figure IR7: Q34. Cause of climate change (Ireland)

For Dublin, these figures are 69% and 3%, respectively (Figure IR8).

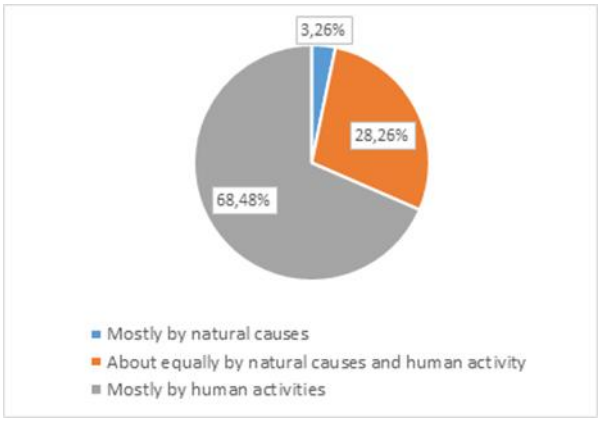


Figure IR8: Cause of climate change (Dublin)

These results indicate a strong acceptance of a human made climate change in our lifetime.

4.1.5.3 Assessment of energy behaviour/attitude related results with respect to themes and subthemes

A considerable part of the ECHOES questions deals with respondents' energy behaviour and their attitudes towards energy related topics. 60% of the respondents strongly agree that the use of more renewable energy sources (RES) will benefit the environment and another 30% agree moderately (Figure IR9). Only around 3% think that using more RES will not benefit the environment.

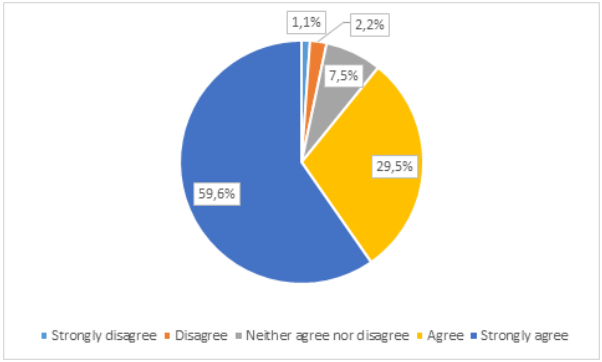


Figure IR9: Renewable energy sources benefit the environment

For the case of Dublin, a higher percentage of respondents believe that RES benefits the environment (Figure IR10).

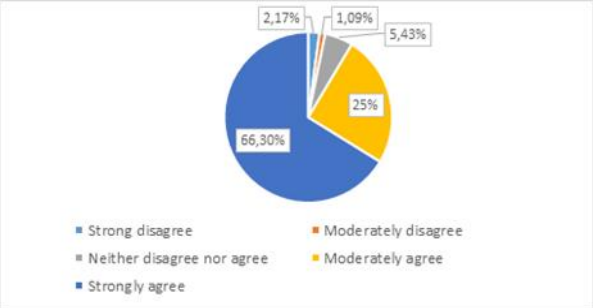


Figure IR10: Renewable energy sources benefit the environment (Dublin)

When stating whether the use of more renewable energy sources will create new jobs, 40% agree moderately (Figure IR11). However, only 22% strongly agree and 32% are uncertain. This means that while the respondents are less certain about the creation of new jobs than the benefits for the environment, the majority nevertheless agrees with the statement.

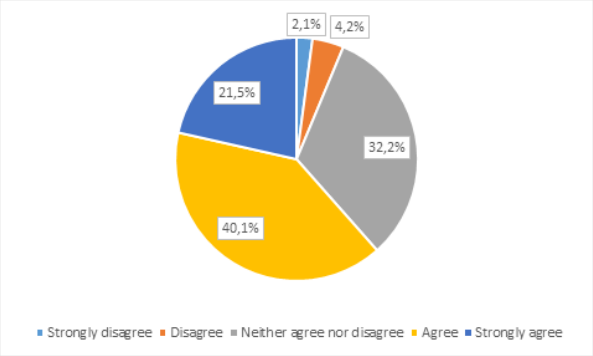


Figure IR11: Renewable energy sources create new jobs

Similar to other questions, the respondents in Dublin demonstrate a higher belief that use of more renewable energy sources will create new jobs (Figure IR12).

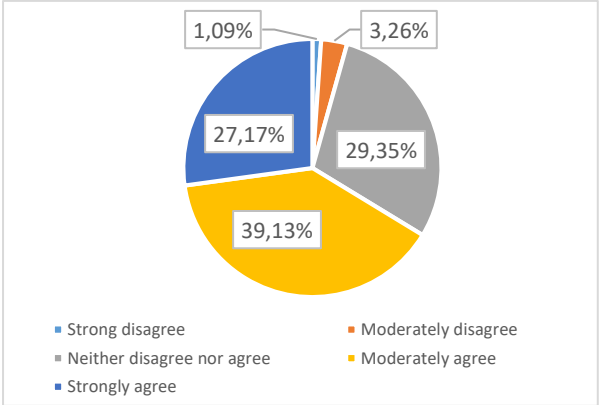


Figure: IR12: Renewable energy sources create new jobs (Dublin)

Questions about energy policies depict somewhat similar results. Figure IR13 shows the acceptance of energy policies that protect the environment but induce higher costs. More than half the respondents agree or strongly agree with the statement, 25% is undecided and 20% disagree.

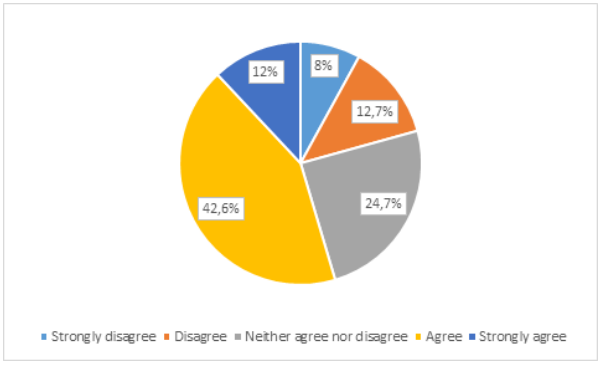


Figure IR13: Acceptance for policies that protect the environment but induce higher costs (Ireland)

In the case of Dublin, the support rate is much higher, at 70% (Figure IR14).

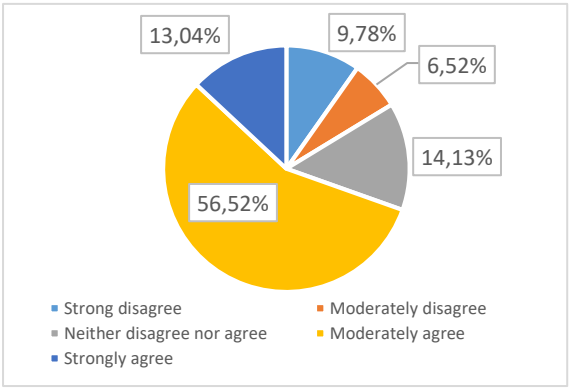


Figure IR14: Acceptance for policies that protect the environment but induce higher costs (Ireland)

Figure IR15 shows the acceptance of energy policies that create new jobs but induce higher costs. The distribution of the answers is almost the same as in Figure 4.75, again slightly more than half of the respondents (strongly) agrees with the statement. At a higher rate as compared to the Ireland sample, 69% of the respondents from Dublin agree that they would accept energy policies that create new jobs even though these induce higher costs. This indicates that higher costs generally find acceptance, however, whether energy policies protect the environment or create new jobs seems of equal importance.

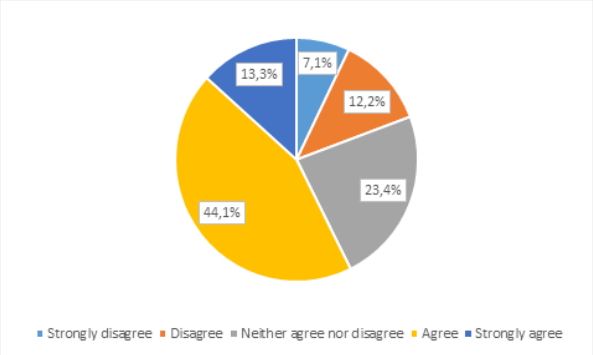


Figure IR15: Acceptance for policies that create new jobs but induce higher costs (Ireland)

These attitudes toward energy topics seems to translate to real actions in a consistent way. Respondents were asked whether they were interested in the possibility of a real investment in renewable energy. If so, their email address was to be forwarded to respected companies that offer community-based investments in green power. Further, their email would be used to send them investment opportunities, while respondents could withdraw their confirmation to receive such offers at any time. The results above would suggest that again approximately half of the respondents might be interested in such an opportunity. Indeed, the results show that for Ireland, 51% are interested in the possibility of a real investment in renewable energy, and for Dublin, this rate is around 75%. To sum up, the sample shows a strong acceptance of the benefits of renewable energy sources and of higher costs induced by energy policies. These attitudes are underlined by an equally strong interest in a real investment in renewable energy.

4.1.5.4 Assessment of lifestyle-related results with respect to themes, subthemes, and focal areas

A central part of the ECHOES database sheds light on lifestyle-related topics and gives valuable insights into energy-related every-day actions and opinions. Figure IR16 reveals that 67.5% of the respondents agree that each individual can do much to support the energy transition.

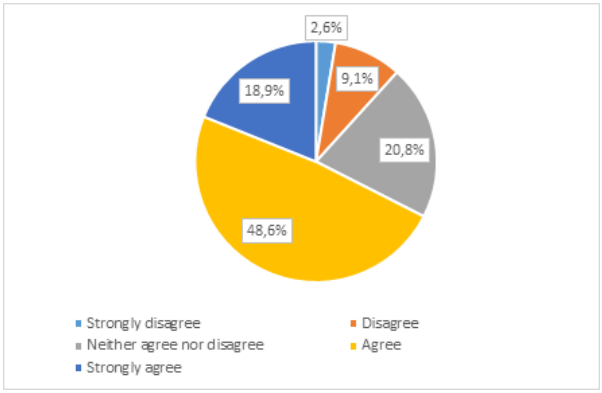


Figure IR16: "I can do a lot to support the energy transition" (Ireland)

Further, 72.6% agree that people can act together to achieve the energy transition (Figure IR17).

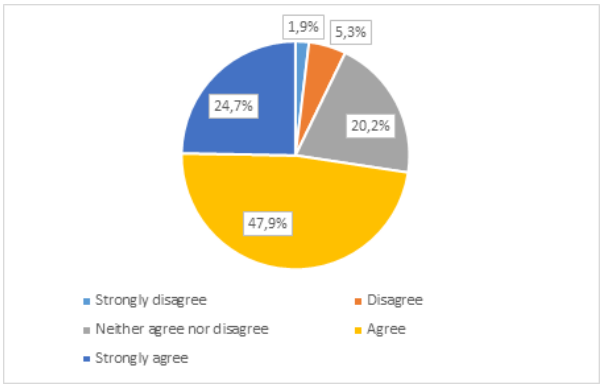


Figure IR17: "We as people can act together to achieve the energy transition" (Ireland)

For the case with Dublin, 69.6% of the respondents agree that each individual can do much to support the energy transition.

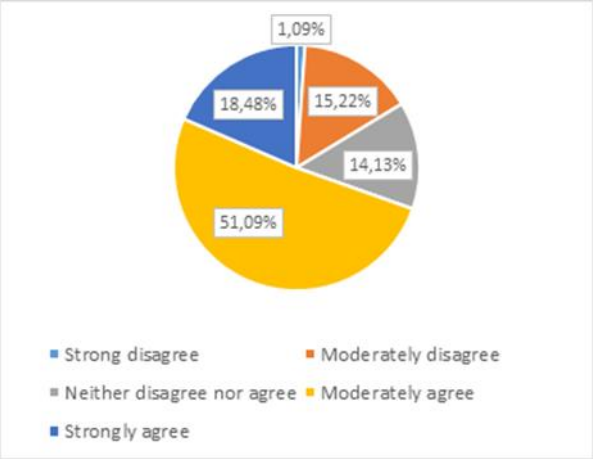


Figure IR18: "I can do a lot to support the energy transition" (Dublin)

When it comes to collective contribution to energy transition, 79.3% of the respondents from Dublin agree that people can act together to achieve the energy transition (Figure IR19).

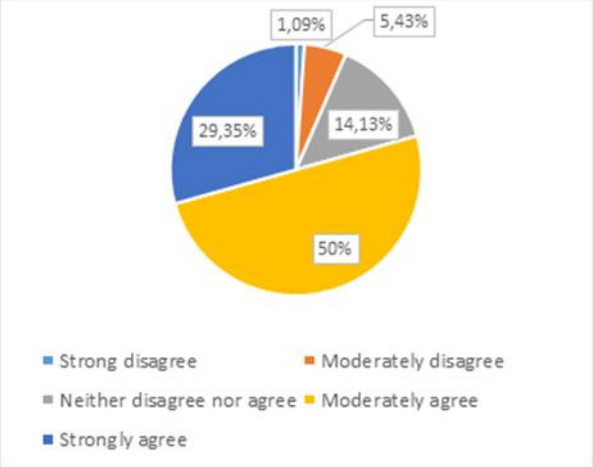


Figure IR19: "We as people can act together to achieve the energy transition" (Dublin)

Public and private transport play an important role in the energy-life of individuals. Figures IR20 to IR25 displays various public transportation (PT) related results. 35% are satisfied with the local public transportation system. Around 39% are dissatisfied.

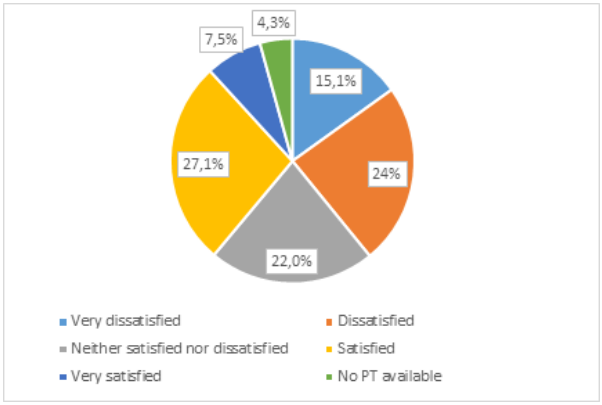


Figure IR20: Satisfaction with the public transportation system

The level of satisfaction with the public transportation in Dublin is at a higher rate, 56% (Figure IR21).

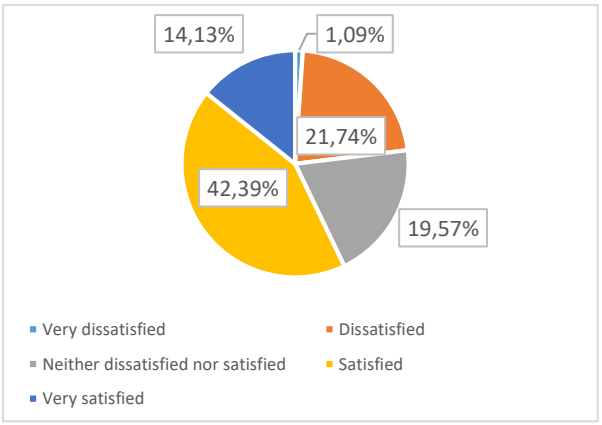


Figure IR21: Satisfaction level of respondents on current public transportation system (Ireland)

Only 14% agree that the public transportation system in their area is environmentally friendly. 34% are uncertain and a majority of 52% disagree (Figure IR22).

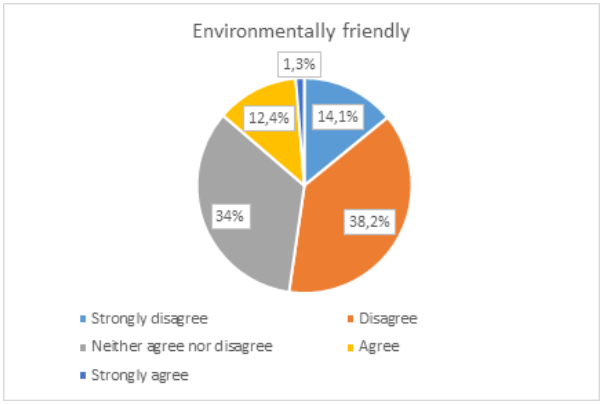


Figure IR22. Perception on whether the public transportation system is environmentally friendly

The results for Dublin are similar, although with a slightly higher level of agreement that the public transportation is environmentally friendly.

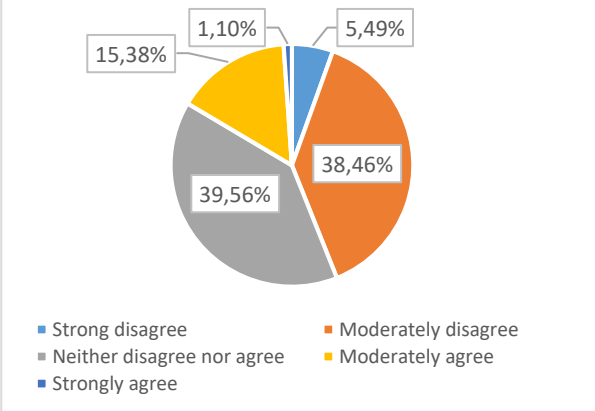


Figure IR23: Perception on whether the public transportation system is environmentally friendly (Dublin)

Looking at the specific number of trips using public transportation, it is obvious that public transportation seems to be only moderately regarded and thus may be partly underutilized. 60% of the respondents rarely use public transport on a weekly basis, even though this indicator includes travels to work or for shopping. Only 3% use it more than 12 times per week. Nevertheless, for 23% use is 1-4 times per week (Figure IR 24).

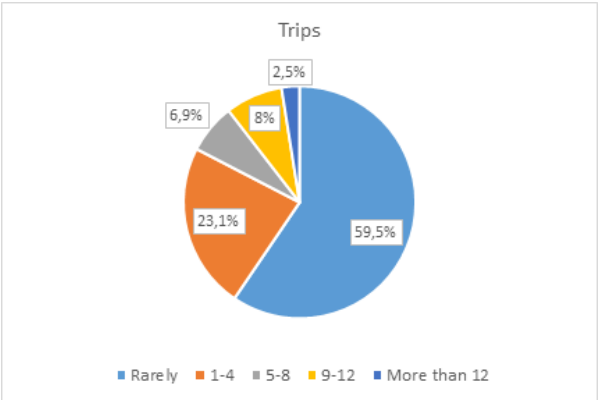


Figure IR24: Trips per week by using public transportation (Ireland)

Lastly, the most popular type of public transport seems to be by bus with 45%, followed by train with 22% and tram with 14%. However, 47% of the respondents do not use any of these routinely. Underground transportation in Ireland is not relevant.

Lastly, the most popular type of public transport seems to be by bus with 72%, followed by tram (36%) and train (22%). However, 21% of the respondents do not use any of these routinely (Figure IR25).

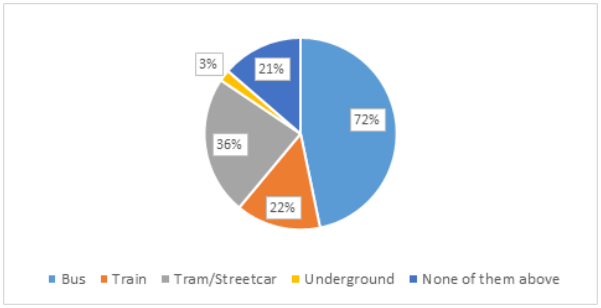


Figure IR25: Type(s) of public transportation used as a part of routine mobility

Regarding private transportation, 15% does not drive any distance with a car as a driver per year, even though this indicator includes driving to work, etc. One fifth of the respondents drive between 5 to 10 thousand kilometres per year and another 18%, 10 to 15 thousand kilometres. The exact distribution is illustrated in Figure IR26

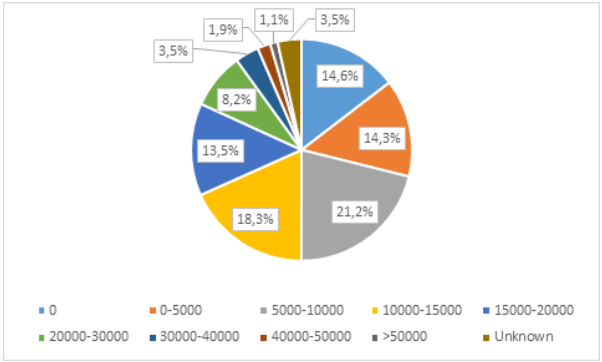


Figure IR26: Kilometres per year by private vehicles (Ireland)

30% of the respondents in Dublin City do not drive any kilometre with a car as a driver per year. This figure is double the country-wide figure of 15% and may be explained by wider availability of public transport for this subgroup residing within the boundaries of Ireland's Capital City. A further 39% of respondents are driving between 5 to 10

thousand kilometres per year, and another 11% of respondents reported driving 10 to 15 thousand kilometres (Figure IR27).

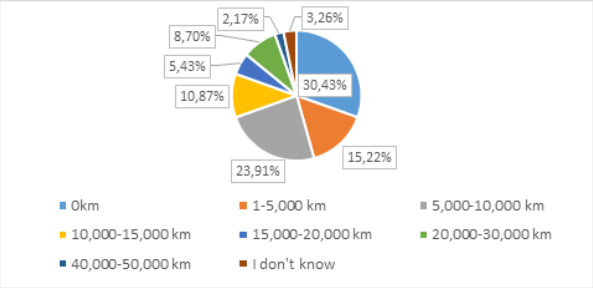


Figure IR27: Kilometres per year by private vehicles (Ireland)

As Figure IR28 shows, driving alone in one's car is a popular choice, one reason might be that this includes commuting. 56% drive alone very often or almost always and another 21%, half of the time. Only 8% almost never drive alone in their car. The results for Dublin are similar. These results reveal a substantial energy saving potential in private transportation.

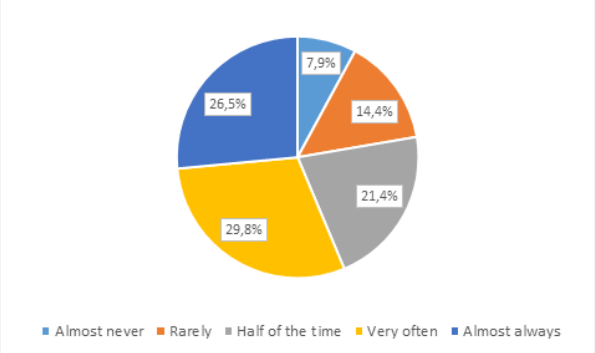


Figure IR28: Frequency of driving alone

This potential is supported by Figure IR29, which indicates that 89% of the respondents have never tried car-sharing, but a total of 46% is interested in the possibility. Only 3% have tried but did not like car-sharing.

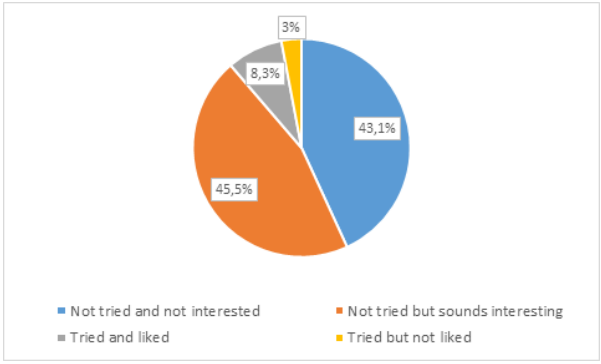


Figure IR29: Car sharing (Ireland)

For Dublin, that 81% of the respondents have never tried car-sharing, but a total of 42% expressed interest in the possibility. A further 3% have tried it but did not like car-sharing.

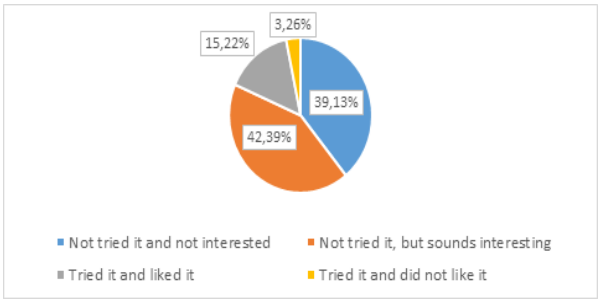


Figure IR30: Car sharing (Dublin)

Bicycle use is another important domain of private transportation. IR31 reveals that 79% of the respondents almost never use their bicycle to go to work or to do shopping. This in turn means that only around 21% use their bicycle somewhat regularly for work and shopping, with 5% usually using a bicycle for work and shopping all year long.

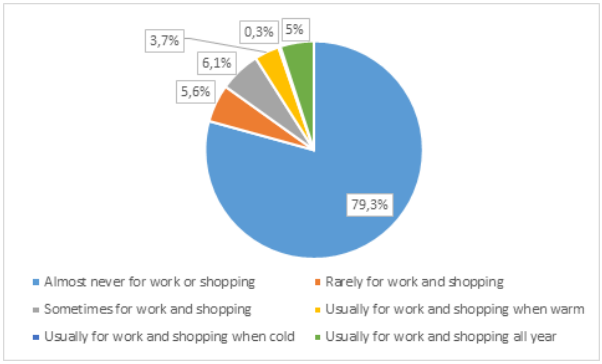


Figure IR31: Bicycle use (Ireland)

For Dublin, Figure IR32 reveals that 64% of the respondents almost never use their bicycle to go

to work or to do shopping. This in turn means that only around 21% use their bicycle somewhat regularly for work and shopping, with 11% stating that they 'usually' use a bicycle for work and shopping all year long.

Figure IR32: Bicycle use (Dublin)

Hence, bicycle usage offers large saving potentials in private transportation.

Electric bicycles might offer an acceptable option for many. However, Figure IR33 shows that only 12% agree that they intend to purchase an electric bicycle within the next five years and 24% are undecided. For Dublin, these figures are 21% 15%, respectively. In both cases, only around 5% own an electric bicycle, an uptake of this rate might offer a possibility to decrease distances driven by car and increase the usage of bicycles for work and shopping travels.

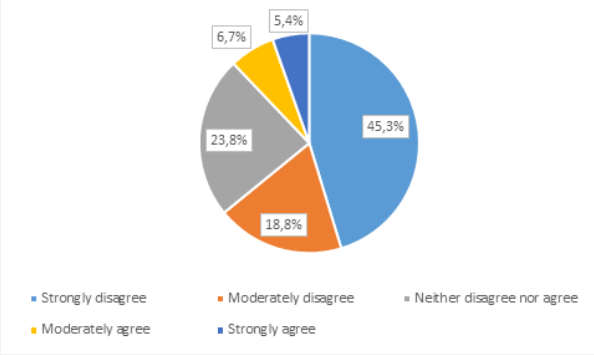


Figure IR33: Electric bicycle

A large part of energy-lifestyle is related to decisions at the own home. Regarding heating, 82% of the respondents have a central heating for the whole dwelling and only 1.3% district heating to multiple houses. The remaining answers consist of stoves, electric heaters or the respondents do not know their heating system. In the case of Dublin, 71% of the respondents have a central heating for the whole dwelling such as oil or gas heating. The remaining answers consist of district heating (1%) stoves (7%), electric heaters (18%) or the respondents do not know their heating system (3%) (Figure IR34).

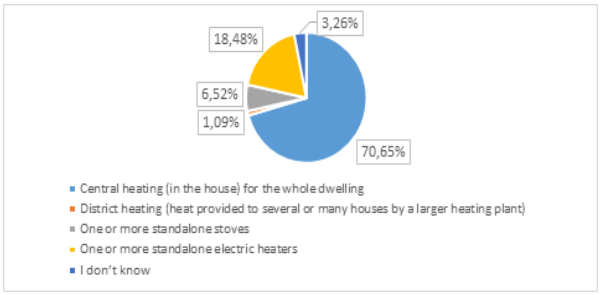


Figure IR34: Heating types (Ireland)

Regarding air conditioning, the results are similar for Ireland and Dublin, with 93%, the vast majority does not own an air conditioner and only about 1% use it regularly or often. The savings potential is very small in this case (Figure IR35).

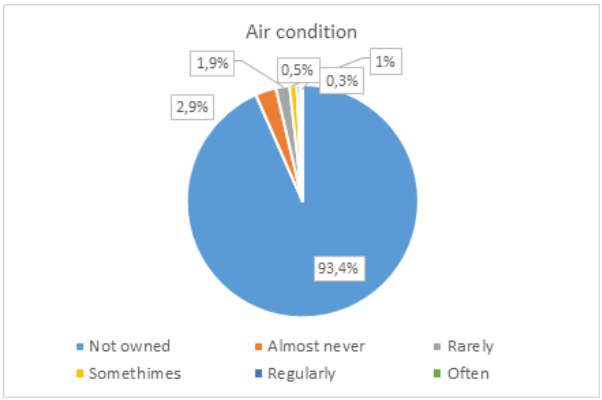


Figure IR35: Air conditioner use

Approximately 49% often or always disconnect electric appliances when not in use. This means that 51% do not frequently unplug appliances including 15% that never do it. This might offer an acceptable and easy to implement opportunity for many households to save energy and money without loss of comfort (Figure IR37).

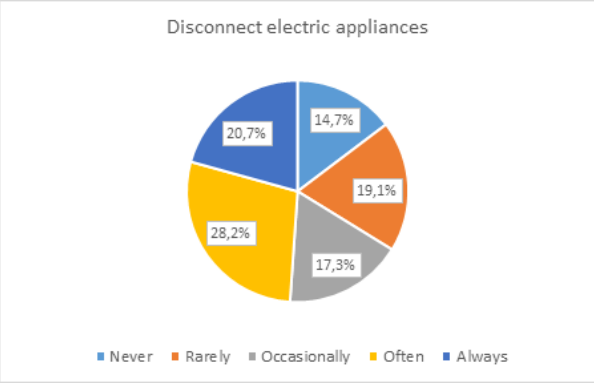


Figure IR37: Disconnect electric appliances

Lastly, when asked whether respondents purchase electricity from a provider with a particularly high share of renewable energy production, 26% answer with Yes and 11% with No. This means that 63% do not know whether their electricity provider has a larger share of renewables (Figure IR38). A certain share of customers might switch to a provider with a higher share of renewables when they are better informed.

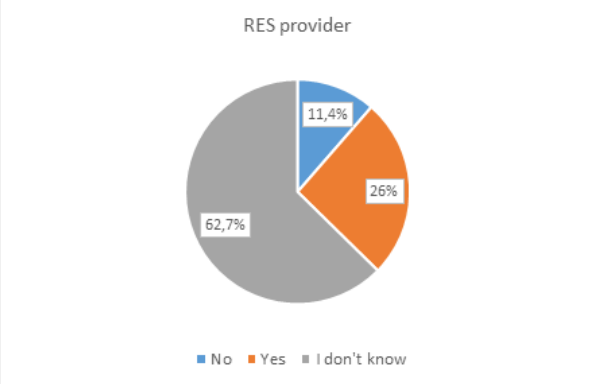


Figure IR38: Purchase electricity from green provider

To sum up, the public transport system is only moderately accepted and offers room for improvement. Its environmental benefits are not well accepted. Other sources of potential savings lie in the fact that many nevertheless mainly drive alone in their car and a considerable but underutilized interest in car-sharing. A lack of bicycle usage and the relatively rare disconnecting of appliances are reasonable issues to build upon. Finally, many respondents are still under-informed about their electricity provider.

4.1.5.5 Interim Conclusion and Suggestions

In terms of age and education, the Irish sample presents a relatively young and highly educated group with more than 60% living in cities. The results indicate a strong acceptance of human made climate change in our lifetime. Energy policies find a relatively strong acceptance and higher costs seem not to be a significant barrier. Renewable energy sources are considered as an influential factor both in an environmental and economic sense. The majority is aware of the importance of both the individual and the group in achieving changes. These attitudes are a solid basis for accepting the need and the meaningful impact of changes in human actions. This reasoning is supported by an actual interest of 51% of the respondents in a real investment in renewable energy.

The public transport system and its environmental benefits are in general rather weakly accepted, and thus, potentially underutilized by a large share of respondents. An uptake of public transport utilization could decrease distances driven by car as a driver substantially. Similarly, this could be achieved by a change in individuals' habits of driving alone. In a similar vein, there is a considerable potential in car-sharing, which, depending on the implementation, could also result in less kilometres driven, less cars, environmentally friendlier cars, etc. Increasing bicycle usage for work and shopping travels would not only decrease motorized driven distances and traffic, but also positively affect health and well-being. Individuals might connect these changes in habits with unreasonable loss of comfort. The issue of disconnecting appliances concerns approximately 51% of respondents and is an energy and cost saving change that comes with no loss of comfort. Finally, 63% of respondents do not know if their electricity provider has a particularly large share of renewable energy sources. This lack of information might prevent

individuals from purchasing their electricity from a greener provider.

Based on this assessment, the main policy conclusion is to incentivize citizens to shift from private car users to a more collective transport behaviour with increasing usage of public transportation and car sharing services. One main barrier might be an unattractive public transport system and a lack of believe in its environmental benefits.

Additional Concluding Reflections

While Dublin City Council's (DCC) Climate Change Action Plan is focused on DCC's operations and service delivery, DCC does not have direct responsibility for energy generation and supply, and public transport networks. However, engaging with citizens is necessary for climate action, the challenge is in the methods used to engage citizens.

Historically, Irish local authorities engaged with citizens on planning and policy issues through public consultation, which in Ireland can include public notice in a newspaper to inform the public of consultation and make the document available online or in public buildings such as libraries. Action on climate change demands an evolution in this approach.

DCC recognizes the role it must play in increasing citizen awareness and participation in addressing climate change and its solutions, and the unique position that local government holds in interacting with its citizens.

Where DCC would like to build capacity and strengthen engagement with citizens through CAMPAIGNERS is primarily in our areas of responsibility – active travel (walking, cycling, SUMP), energy awareness (reducing use), resource management (water, food waste, general waste), and adaptation (soft, green and blue measures) the latter two being areas not explicitly considered in the ECHOES survey but are of significant importance in climate action for Dublin.

4.1.6 Italy with a focus on Milano

4.1.6.1 Demographics

The ECHOES database includes 602 respondents from Italy. Due to the small number of city specific respondents, the assessment of the ECHOES data is done on the country level. However, the analysis for Milan is based on the "Citizen and Climate Change"[2] report published by Milan Municipality in 2020. The report illustrates the result of an online questionnaire that has been prepared to detect citizen's knowledge, concern, behaviours and ideas on climate change, and conducted with 7551 respondents. The survey was the first step of the participatory process adopted by the Municipality to discuss and refine with citizens and stakeholders the proposals for the territory contained in the Air and Climate Plan (PAC). The PAC is the city's strategic development tool – adopted in 2020 – that addresses the issue of adaptation to climate change on the urban scale. It defines Milan's objectives and adaptation measures integrating them with mitigation and air quality measures.

Of all respondents from Italy, 50% are male and 77% live in an urban area, namely a town or city with more than 10 000 inhabitants. Most of the respondents are between 18 and 34 years old (35%), approximately 20% fall in each of the remaining three age categories (see Figure IT1).

[2] Milan Municipality (2020) *Report Cittadini e cambiamenti climatici: un'analisi esplorativa*. https://www.comune.milano.it/documents/20126/12628 7263/05102020_Cittadini+e+cambiamenti+climatici_un%27indagine+esplorativa.pdf/c89cdaa0-41dd-fadb-b0d0-06cecfd7da9b?t=1602067034807

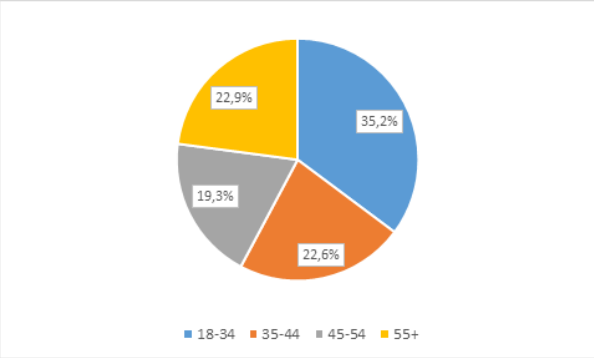


Figure IT1: Respondents by age

70% of the respondents are employed, around 6% are retired, 2% students and 12% unemployed. As indicated in Figure IT2, educational attainments in the sample are high with 40% tertiary education, 48% A-levels (qualification for university) and 5% with a professional training in practical skills. Only 7% attained up to secondary education.

Figure IT3 further shows how respondents place themselves on a subjective social ladder, with 1 indicating being at the lowest level and relatively speaking worst off and 5 being at the highest level and best off. While the vast majority (65%) places themselves in the middle, in total, 78% place themselves in the middle or higher and only 6% feel they are socially worst off in the society. All in all, the sample presents a relatively young, highly educated group mainly from cities with a solid self-perceived social standing.

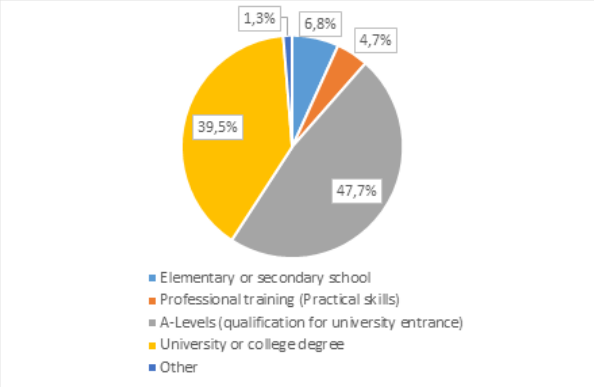


Figure IT2: Respondents by education level

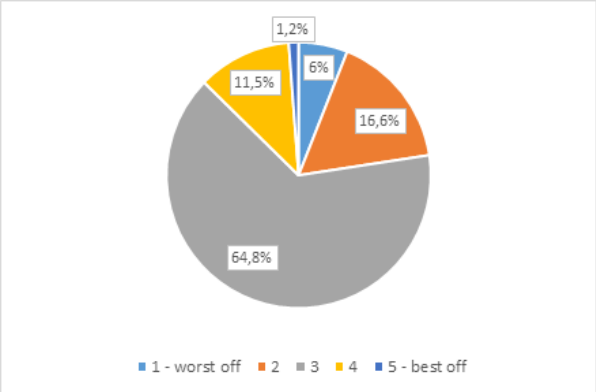


Figure IT3: Respondents by perceived social status

For the Milano sample, 56% of the respondents are female. Most of the respondents are 55 years old or older (40.3%), and the participation rate in the questionnaire increases with the increasing age (see Figure IT4).

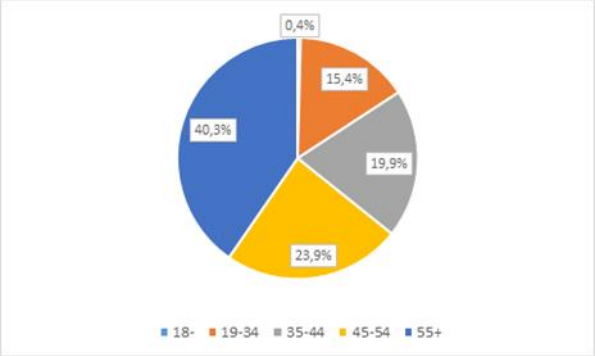


Figure IT4: Respondents by age (city level)

Only 2.7% of the respondents are unemployed, and 3.8% are students. 52.1% of all respondents fall in the last three categories namely, 17.2% are retired, 21,1% work in a highly specialised job, and the remaining 13,8% work in an executive position (see Figure IT5).

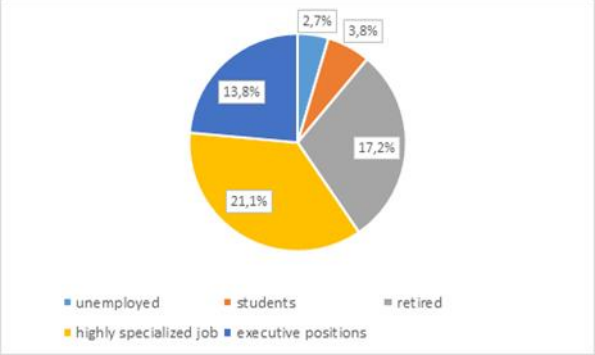


Figure IT5: Respondents by employment types

In Figure IT6, educational attainments in the sample are high with 65% tertiary education, 32% secondary education and only 2% with primary education.

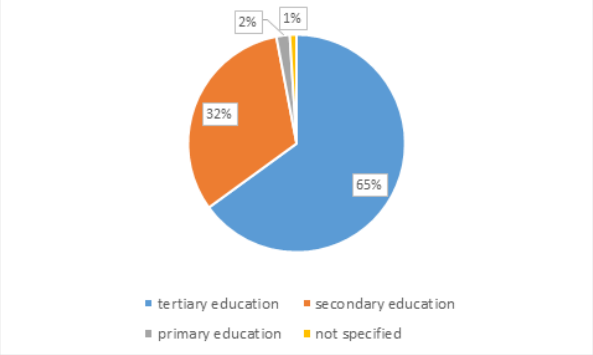


Figure IT6: Respondents by education level

4.1.6.2 Assessment of climate change-related results with respect to themes and subthemes

Two questions directly relate to climate change. As Figure IT7 shows, most respondents (53%) agree with the statement that the world's temperature has gradually been rising over the past 100 years as most scientists state. Only around 3% (rather) disagree and 14% are not sure.

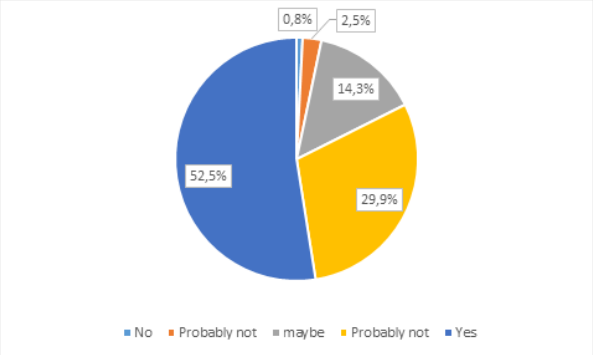


Figure IT7: Climate change

And when asked what the cause of climate change is, assuming the temperature is rising, more than half of the respondents (58%) think that climate change is mainly caused by human activities and only 7% think that it is mainly due to natural causes (Figure IT8). These results indicate a strong acceptance of a human made climate change in our lifetime.

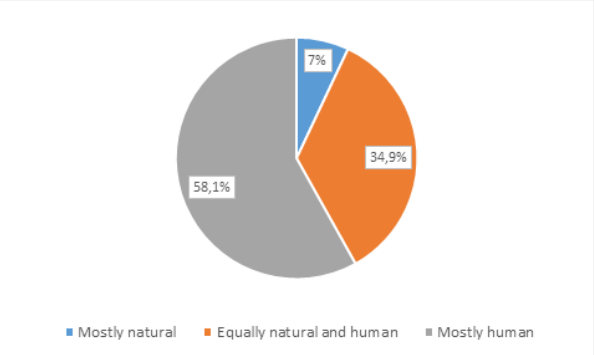


Figure IT8: Cause of climate change

According to the results of the *Citizen and Climate Change* questionnaire, most respondents from Milano acknowledge that the climate is changing (71,4% strongly agree, 24,7% agree). Only the remaining 3,9% disagree or are not sure (see Figure IT9).

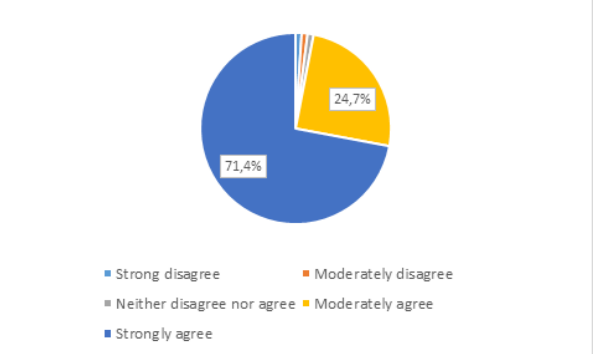


Figure IT9: Climate change (city level)

When asked what the cause of climate change is, assuming the temperature is rising, more than half of the respondents think that climate change is mainly caused by human activities (46,2% strongly agree and 39% agree), 7,8% are not sure, and the remaining 7% think that it is mainly due to other causes (see Figure IT10).

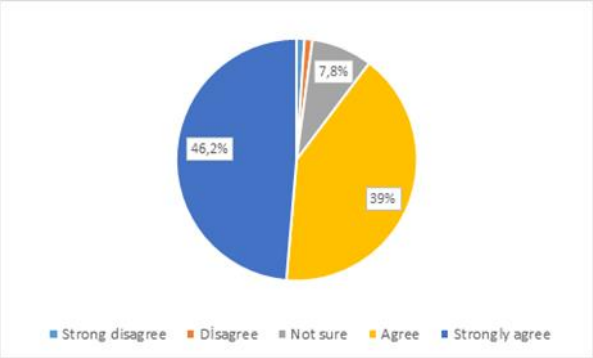


Figure IT10: Greenhouse effect is a phenomenon caused by human societies

4.1.6.3 Assessment of energy behaviour/attitude related results with respect to themes and subthemes

A considerable part of the ECHOES questions deals with respondents' energy behaviour and their attitudes towards energy related topics. 56% of the respondents strongly agree that the use of more renewable energy sources (RES) will benefit the environment and another 30% agree moderately (Figure IT11). Only around 3% do not think that using more RES benefits the environment.

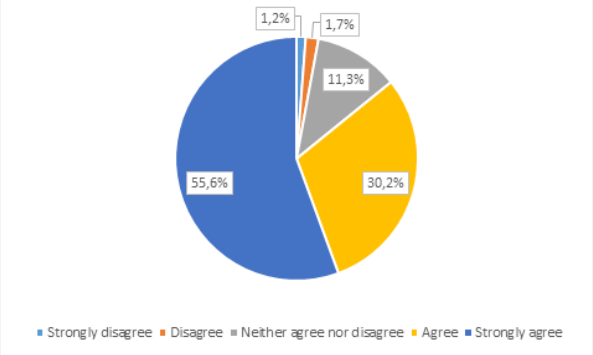


Figure IT11: Renewable energy sources benefit the environment

When stating that the use of more renewable energy sources will create new jobs, 39% agree moderately (Figure IT12). However, only 25% strongly agree and 31% are uncertain. This means that while the respondents are less certain about the creation of new jobs than the benefits for the environment, the majority nevertheless agrees with the statement.

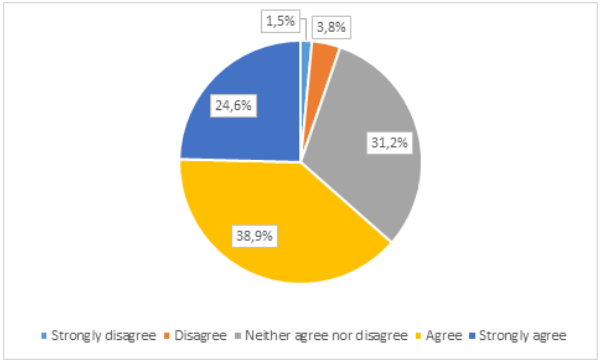


Figure IT12: Renewable energy sources create new jobs

Questions about energy policies depict somewhat similar results. Figure IT13 shows the acceptance of energy policies that protect the environment but induce higher costs. Almost half of the respondents agree or strongly agree with the statement, one third is undecided and 18% disagree.

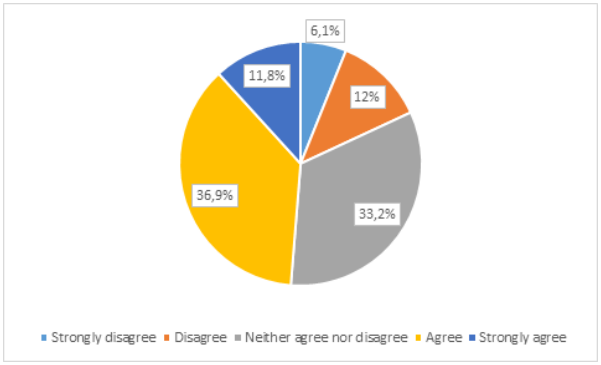


Figure IT13: Policies that protect the environment

Figure IT14 shows the acceptance of energy policies that create new jobs but induce higher costs. The distribution of the answers is similar as in Figure IT13, slightly more than half of the respondents (strongly) agrees with the statement. This indicates that higher costs generally find acceptance, however, whether energy policies protect the environment or create new jobs seems of equal importance.

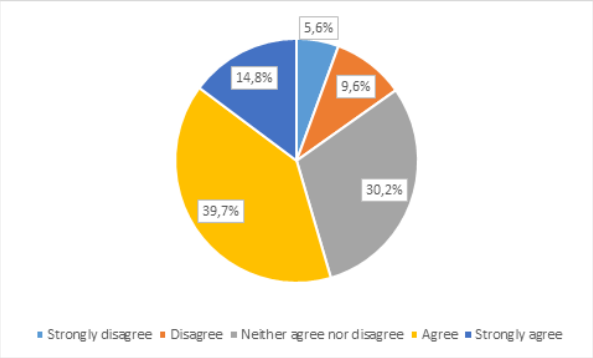


Figure IT14: Policies that create new jobs

These attitudes toward energy topics seem to translate to real actions in a positive way. Respondents were asked whether they were interested in the possibility of a real investment in renewable energy. If so, their email address was to be forwarded to respected companies that offer community-based investments in green power. Further, their email would be used to send them investment opportunities, while respondents could withdraw their confirmation to receive such offers at any time. The results above would suggest that approximately half of the respondents might be interested in such an opportunity. The results show that even 60% are interested in the possibility of a real investment in renewable energy. To sum up, the sample shows a relatively strong acceptance of the benefits of renewable energy sources and of higher costs induced by energy policies. These attitudes are underlined by a high interest in a real investment in renewable energy.

For the case of Milano, 32.4% of the respondents declare to use renewable energy sources (26.5% always and 5.9% only sometimes). 29.5% declare to not use it yet, but with the intention of using it in the future. 20.2% of the respondents are likely to use energy from renewable sources but there are technical and/or administrative constraints that prevent them from doing so. 2.4% do not want to use this kind of resources and, finally, 15.5% declare to have no sufficient knowledge on the issue (see Figure IT15).

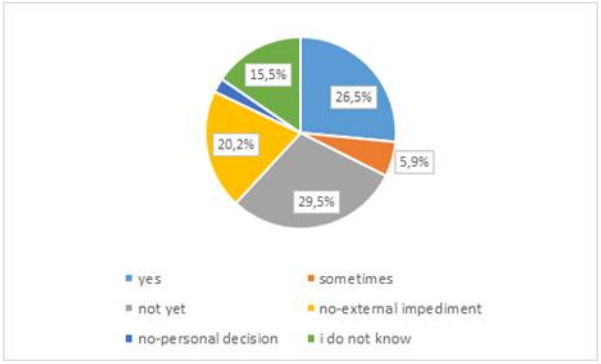


Figure IT15: Energy behaviour

Then, respondents were asked about the main obstacles to undertaking environmentally friendly and sustainable measures related to the households. The majority of the respondents (36.4%) think that these interventions are too expensive. 18.1% state that the adoption of a sustainable lifestyle (and RES) is not possible in their accommodation. Over 16% declare that it is a time-consuming process. 10.8% do not want to change personal habits. 5.2% are not convinced. Finally, 4.6% do not know how to undertake these measures and changes (see Figure IT16).

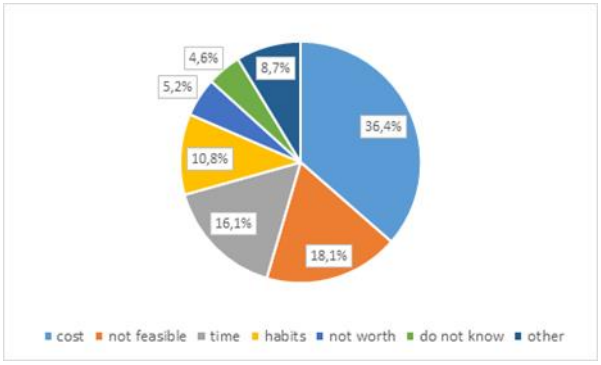


Figure IT16: Obstacle to environmentally friendly lifestyle

4.1.6.4 Assessment of lifestyle-related results with respect to themes, subthemes, and focal areas

A central part of the ECHOES database sheds light on lifestyle-related topics and gives valuable insights into energy-related every-day actions and opinions. Figure IT17 reveals that 59% of the respondents (strongly) agree that each individual

can do much to support the energy transition. Further, 76% (strongly) agree that people can act together to achieve the energy transition (see Figure IT18).

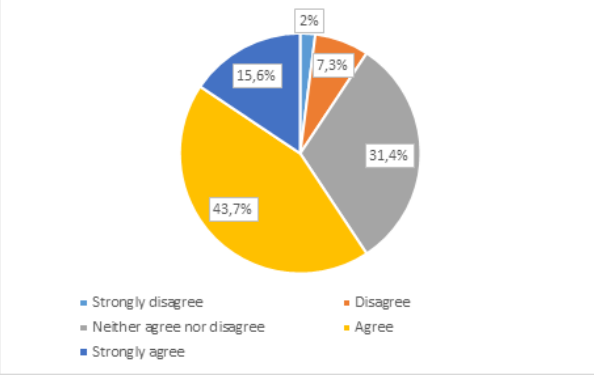


Figure IT17: I can do a lot to support the energy transition.

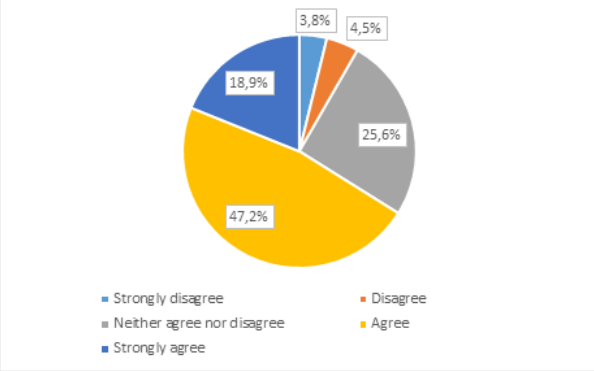


Figure IT18: We as people can act together to achieve the energy transition.

For the case of Milano, more than 85% of the respondents agree that individual action helps to reduce the impact on climate change (45.5% strongly agree, while 43% agree) in Figure IT19.

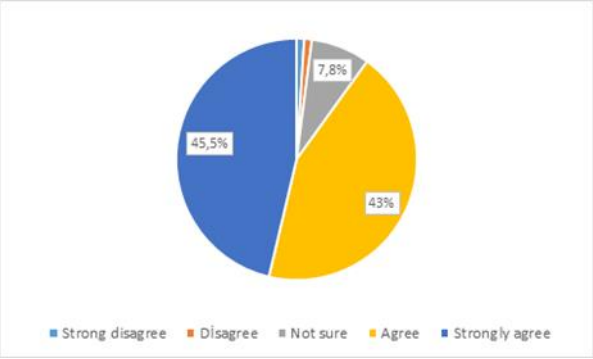


Figure IT19: I can do a lot to support the energy transition (city level)

Public and private transport play an important role in the energy-life of individuals. Between Figures (IT20-IT23) displays various public transportation (PT) related results. Only 23% are (very) satisfied with the public transportation system in their area. Around 44% are (very) dissatisfied. Only 18% (strongly) agree that the public transportation system in their area is environmentally friendly. 36% are uncertain and a majority of 57% (strongly) disagrees.

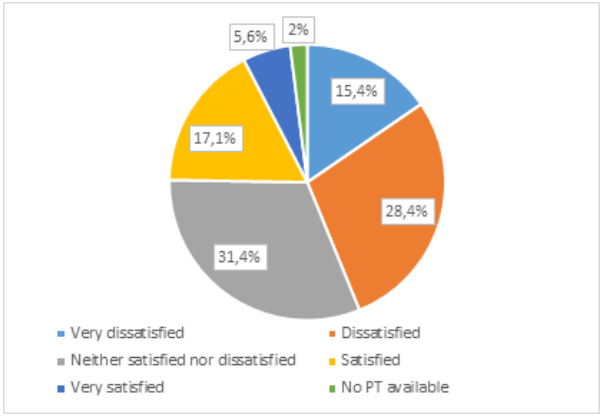


Figure IT20: Satisfaction level of respondents on current public transportation system

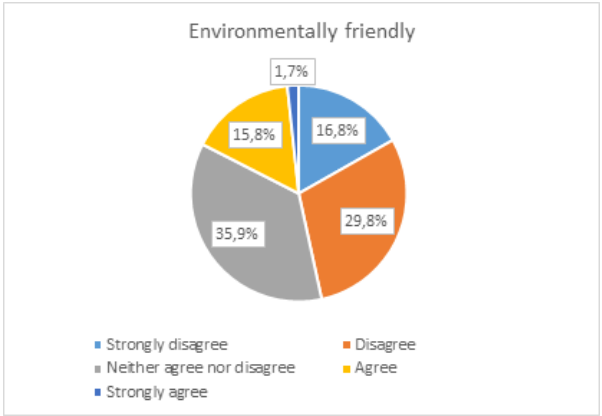


Figure IT21: The public transportation system in my area to be environmentally friendly

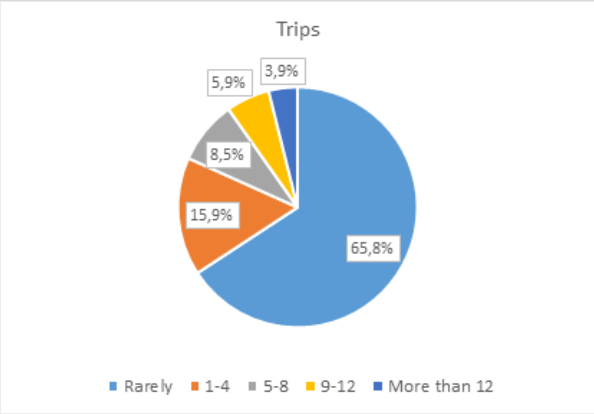


Figure IT22: Trips per week by using public transportation on average

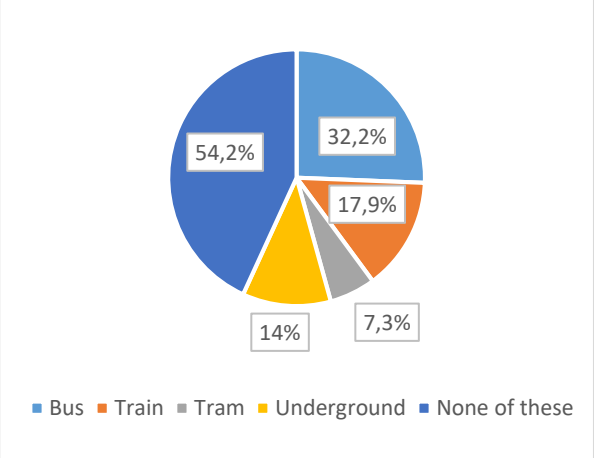


Figure IT23: Type(s) of public transportation use as a part of routine mobility

Looking at a specific number of trips using public transportation, it is obvious that public transportation seems to be only weakly regarded and thus may be partly underutilized. 66% of the respondents rarely use public transport on a weekly basis, even though this indicator includes travels to work or for shopping. Only 4% use it more than 12 times per week. Nevertheless, 16% use is 1-4 times per week. Lastly, the most popular type of public transport seems to be by bus with 32%, followed by train with 18% and underground with 14%. However, 54% of the respondents do not use any of these routinely. Underground transportation in Italy is relevant in several cities, including Milan.

Regarding private transportation, only 7% do not drive any kilometre with a car as a driver per year, even though this indicator includes driving to work, etc. One fourth of the respondents are driving between 5 to 10 thousand kilometres per year and another 19% 10 to 15 thousand kilometres. The exact distribution is illustrated in Figure IT24.

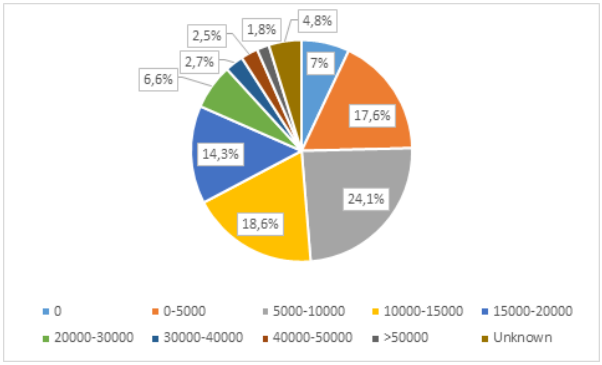


Figure IT24: Kilometres per year

As Figure IT25 shows, driving alone in one's car is a popular choice, one reason might be that this includes commuting. 46% drive alone very often or almost always and another 25% half of the time. Only 9% almost never drive alone in their car. These results reveal a substantial energy saving potential in private transportation.

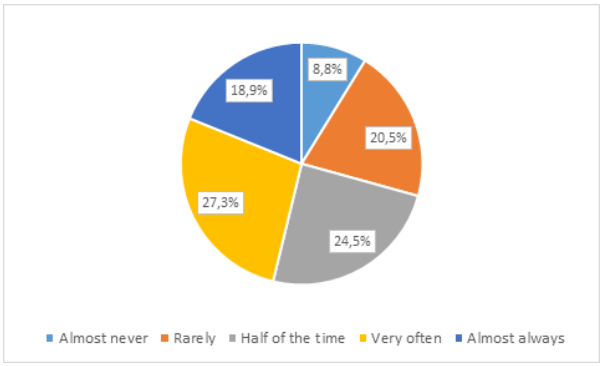


Figure IT25: Driving alone

This potential is supported by Figure IT26, which indicates that 84% of the respondents have never tried car-sharing, but a total of 40% is interested in the possibility. Only 2,5% have tried but did not like car-sharing.

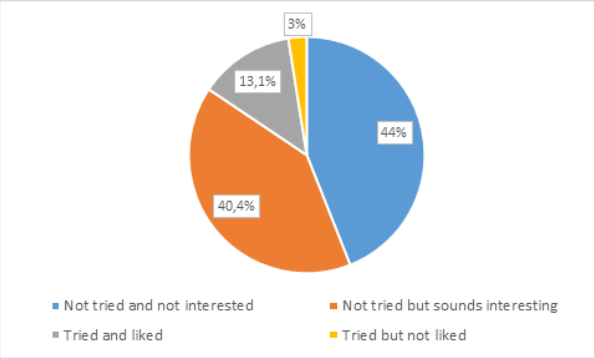


Figure IT26: Car sharing

Bicycle use is another important domain of private transportation. Figure IT27 reveals that 70% of the respondents almost never use their bicycle to go to work or to do shopping. This in turn means that only around 20% use their bicycle somewhat regularly for work and shopping, with 9% usually using a bicycle for work and shopping all year long. While for many of these 70% it might be implausible to use a bicycle due to larger distances, bicycle usage offers large saving potentials in private transportation.

Figure IT27: Bicycle use

Electric bicycles might offer an acceptable option for many. Indeed, Figure IT28 shows that 39% agree that they intend to purchase an electric bicycle within the next five years and 31% are undecided. 30% (strongly) disagree. Since only 1% own an electric bicycle, an uptake of this rate might offer a possibility to decrease distances driven by car and increase the usage of bicycles for work and shopping travels.

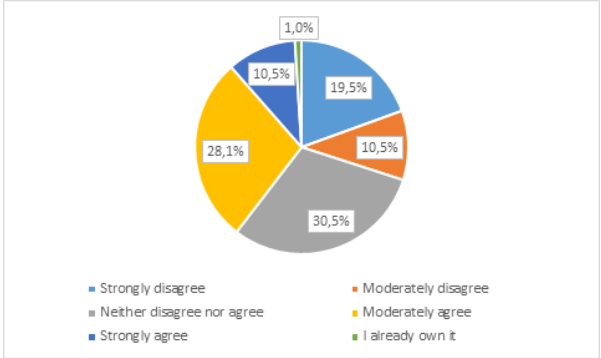


Figure IT28: Electric bicycle

For the case of Milano, results of the "Citizen and Climate Change" report demonstrate that the vast majority of the respondents (69%) report walking or cycling for their daily commute when the commute takes less than 20 minutes (see Figure IT29).

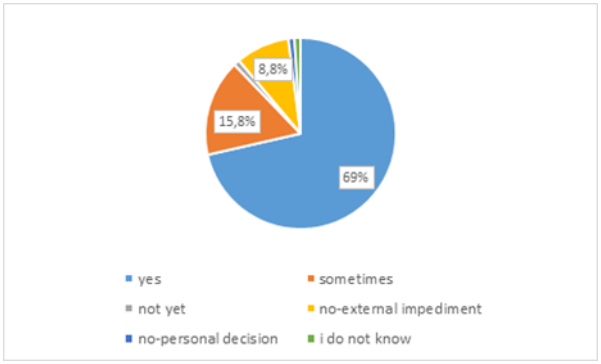


Figure IT29: Daily commute habits (city level)

In contrast to the national assessment, most respondents use public transportation for daily travel (20.5% metro, 11.1% tram, 9.7% bus, and 4.1% train), shown in Figure IT30.

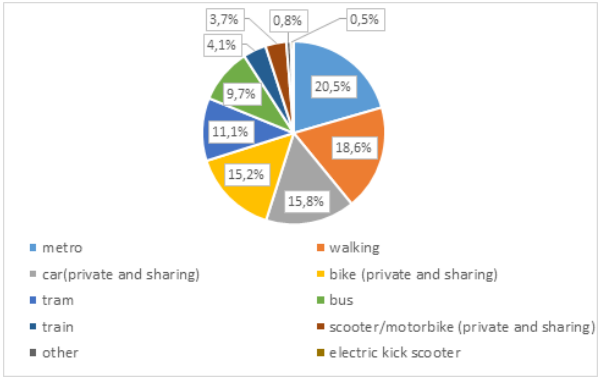


Figure IT30: Transportation habits (city level)

Moreover, most of the respondents declare to use environmentally friendly transportation (18.6% walk, 15.2% use bicycles and 0.5% use electric kick scooter). 15.8% use cars, both private cars and car-sharing, and 3.7% use scooters or motorbikes.

Regarding mobility, 27.2% of the respondents think that the municipal administration should improve cycle and pedestrian paths to help citizens tackle the effects of climate change. To give citizens a proper alternative to the use of private cars, 25.9% think that it should improve the public transport network, while 6.2% suggest enhancing sharing services. Others propose the introduction of incentives for cycling to work (11.9%) or preventing the possibility of residents parking on a second car (3.9%). 10.5% think that the Municipality should implement an awareness-raising communication campaign to engage citizens in the environmental-friendly mobility transition (see Figure IT31).

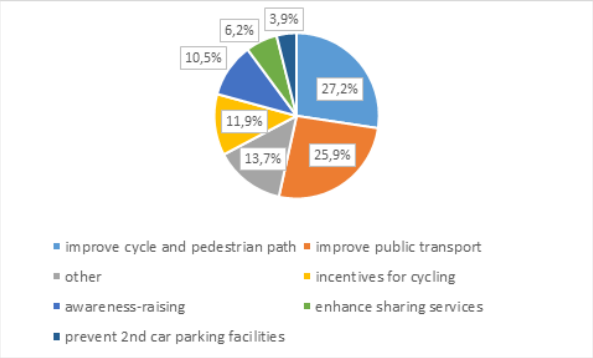


Figure IT31: Citizen's suggestions for the Municipality

A large part of energy-lifestyle is related to decisions at the own home. Figures IT32-IT35 present four important issues. Regarding heating, 62% of the respondents have a central heating for the whole dwelling and only 6% district heating to several houses. The remaining answers consist of stoves, electric heaters or the respondents do not know their heating system. Regarding air conditioning 39% do not own an air conditioner and around 35% use it sometimes to often. There seems to be moderate savings potential in this case.

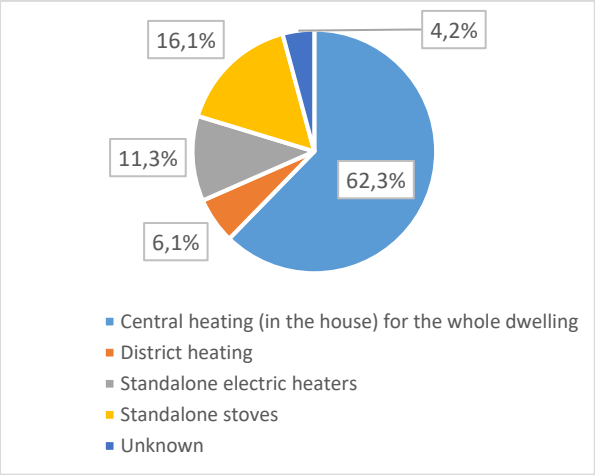


Figure IT32: Heating

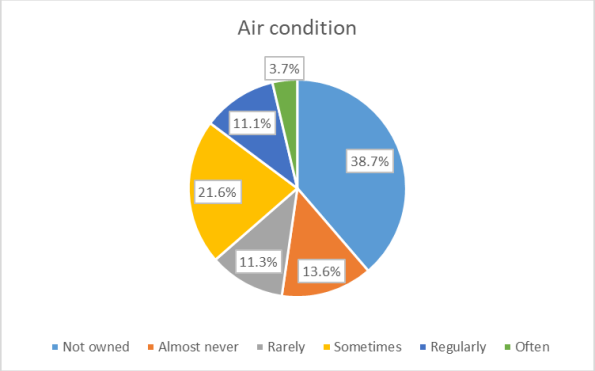


Figure IT33: Air condition use

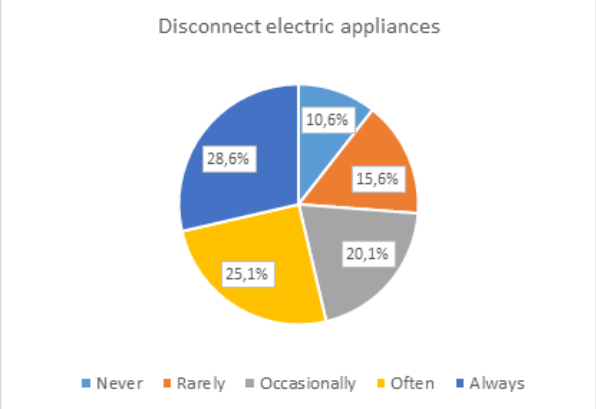


Figure IT34: Disconnect electric appliances

Approximately 54% often or always disconnect electric appliances when not in use. This means that 46% do not frequently unplug appliances including 11% that never do. This might offer a reasonable and easy to implement opportunity for many households to save energy and money without loss of comfort. Lastly, when asked whether respondents purchase electricity from a

provider with a particularly high share of renewable energy production, 23% answer with Yes and 19% with No. This means that 58% do not know whether their electricity provider has a larger share of renewables. A certain share of customers might switch to a provider with a higher share of renewables when they are better informed.

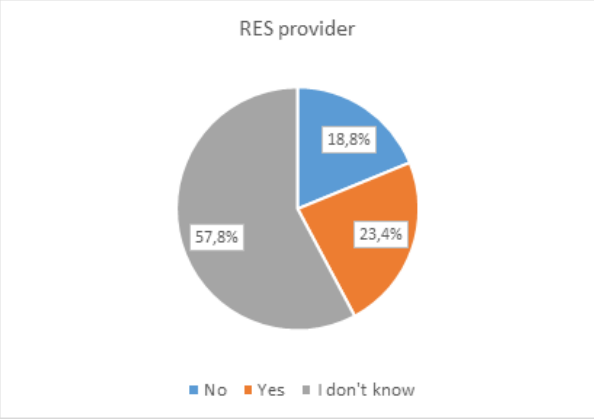


Figure IT35: Purchase electricity from green provider

To sum up, the public transport system is only weakly accepted and offers room for improvement. Its environmental benefits are not well accepted. Other sources of potential savings lie in the fact that many nevertheless mainly drive alone in their car and a considerable but underutilized interest in car-sharing. A lack of bicycle usage and a somewhat rare disconnecting of appliances are reasonable issues to build upon. Finally, many respondents are still under-informed about their electricity provider.

4.1.6.5 Interim Conclusion and Suggestions

In terms of age and education, the Italian sample presents a relatively young and highly educated group with more than 77% living in cities. The results indicate a strong acceptance of anthropogenic climate change in our lifetime. Energy policies find a relatively strong acceptance and higher costs seem not to be a significant barrier. Renewable energy sources are considered as an influential factor both in an environmental and economic sense. The majority is aware of the importance of both the individual and especially the group in achieving changes. These attitudes are a solid basis for accepting the need and the meaningful impact of changes in human actions. This reasoning is strongly supported by an actual interest of 60% of the respondents in a real investment in renewable energy.

The public transport system and its environmental benefits are in general weakly accepted, and thus, potentially underutilized by a large share of respondents. An uptake of public transport utilization could decrease distances driven by car as driver substantially. Similarly, this could be achieved by a change in individuals' habits of driving alone. In a similar vein, there is a considerable potential in car-sharing, which, depending on the implementation, could also result in less distances driven, less cars, environmentally friendlier cars, etc. Increasing bicycle usage for work and shopping travels would not only decrease motorized driven kilometres and traffic, but also positively affect health and well-being. Individuals might connect these changes in habits with unreasonable loss of comfort. The issue of disconnecting appliances concerns approximately 46% of respondents and is an energy and cost saving change that comes with no loss of comfort. Finally, 58% of respondents do not know if their electricity provider has a particularly large share of renewable energy sources. This lack of information might prevent individuals from purchasing their electricity from a greener provider.

Based on this assessment, the main policy conclusion is to incentivize citizens to shift from private car users to a more collective transport behaviour with increasing usage of public transportation and car sharing services. One main barrier might be an unattractive public transport system and a lack of belief in its environmental benefits. The strong interest in real investments in renewables should be considered as well.

4.1.7 Lithuania with a focus on Vilnius

4.1.7.1 Demographics

The ECHOES database includes 601 respondents from Lithuania. 22% of the Lithuanian respondents in the ECHOES survey are from Vilnius – capital of Lithuania. Thus, the assessment is done on both city- and country-levels.

55.1% of all respondents from Lithuania are male and 71% live in an urban area, namely a town or city with more than 10 000 inhabitants. Among respondents from Vilnius, the percentage of male respondents is slightly higher (57.4%) and 93% of them live in an urban area.

While at a country level most of the respondents are between 18 and 34 years old (34%) and approximately 20% fall in each of the remaining three age categories, distribution by age in Vilnius city is slightly different – almost 30% respondents fall in both 18 to 34 and 35 to 49 years categories, and about 20% fall in 50 to 65 and more than 65 years categories (see Figures LT1 and LT2).

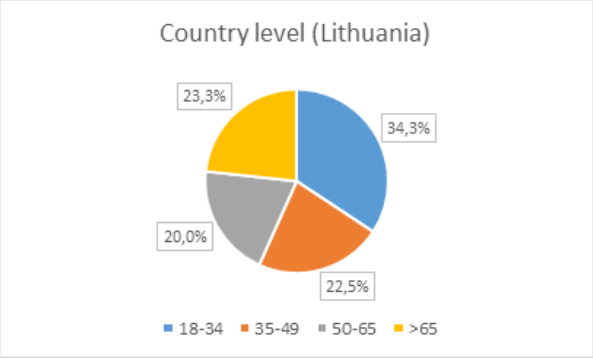


Figure LT1: Respondents by age

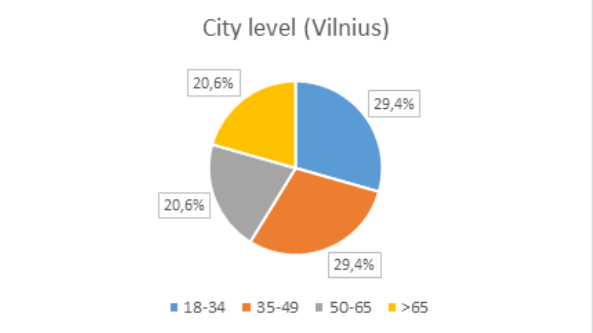


Figure LT2: Respondents by age

78% of the respondents are employed (country level), this indicator is higher in Vilnius context (85%). The share of the retired respondents is higher at the country level by approximately 2% (9% compared to 7% in Vilnius) as well as students (4% compared to 2%) and unemployed respondents (4% compared to 2%).

Educational attainments in the sample are high at the national level - 75% of respondents have university or college degrees. This is higher in Vilnius (more than 83% of respondents) (see Figures LT3 and LT4). A-levels (qualification for university entrance) have 10% of respondents at a country level and more than 7% at a city level. The situation is reversed in the practical skills topic – less than 4% of respondents from Vilnius have professional training, while at a country level this number is higher than 7%. Less than 6% of respondents obtained up to secondary education both on national and at a city level.

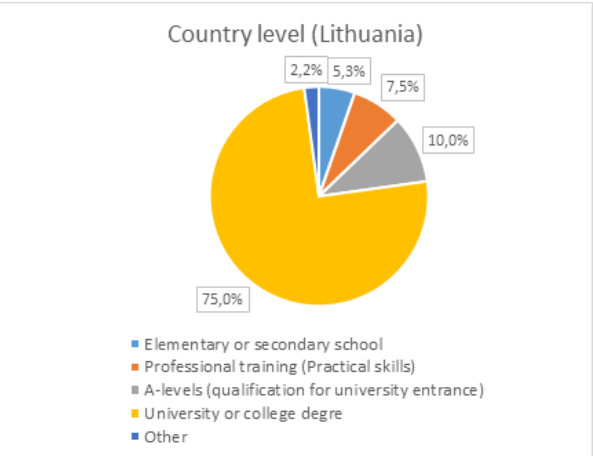


Figure LT3: Respondents by education level

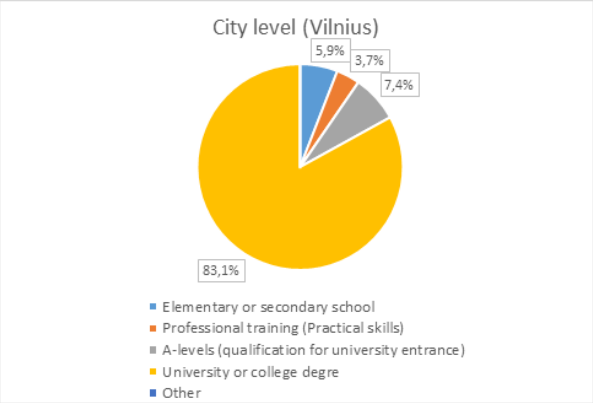


Figure LT4: Respondents by education level

Figures LT5 and LT6 show how respondents place themselves at a subjective social ladder, with 1 indicating being at the lowest level and relatively speaking worst off and 5 being at the highest level and best off. While the vast majority places themselves in the middle (62% at a country level and almost 65% at a city level), difference between country level and Vilnius social status in total is quite big – 80% place themselves in the middle or higher at the country level, and more than 88% do so at the city level. 2.5% at the country level feel they are socially worst off in the society, among respondents from Vilnius only 1.5% feel so.

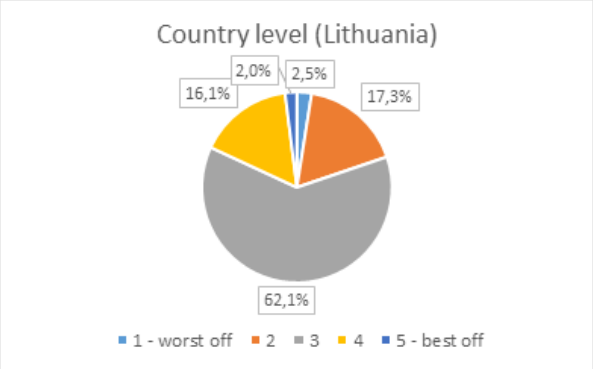


Figure LT5: Respondents by perceived social status

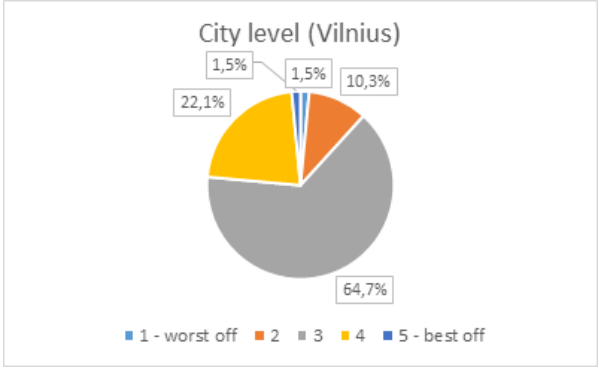


Figure LT6: Respondents by perceived social status

4.1.7.2 Assessment of climate change-related results with respect to themes and subthemes

There are two questions directly related to climate change in the ECHOES database. As Figures LT7 and LT8 show, at the national level only 32% confidently agree with the statement that the world's temperature has gradually been rising over the past 100 years as most scientists state, and another 34% think it is probably true. These numbers are higher at the city level – more than 35% of respondents from Vilnius agree with this statement and almost 35% think it is probably true. The number of disagreeing respondents is lower at the city level, compared to the country level (4% compared to 5% of strongly disagreeing respondents and 5% compared to 8% of probably disagreeing respondents). The proportion of respondents who are not sure about this topic is quite similar – about 20% of the respondents on both levels.

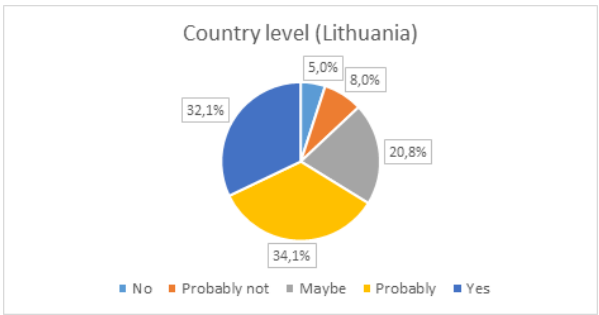


Figure LT7: Climate change

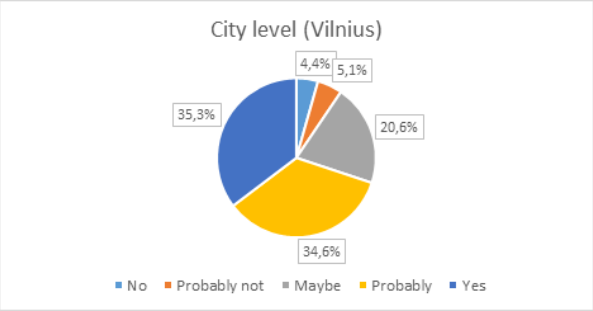


Figure LT8: Climate change

Among the respondents who believe climate change is happening, more than a half (as seen at Figures LT9 and LT10) think it is caused equally by natural causes and human activity (53% at the country-level and 60% at the city-level). About 30% of respondents from Vilnius think the cause is mainly human activities. When all respondents from Lithuania are considered, the percentage of respondents who believe that climate change is caused mainly by human activities is at a higher 39.4%. Overall belief that climate change is caused by natural causes is lower at the country level (7%) compared to the city level assessment (9%).

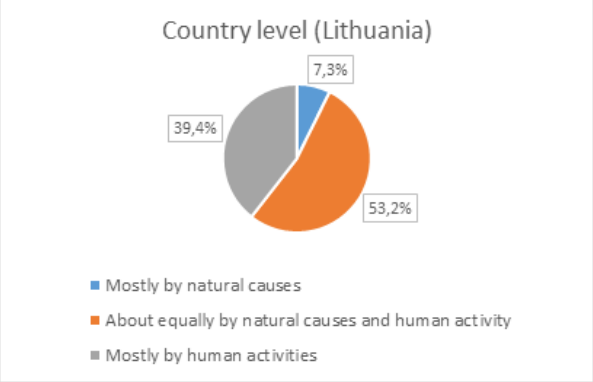


Figure LT9: Cause of climate change

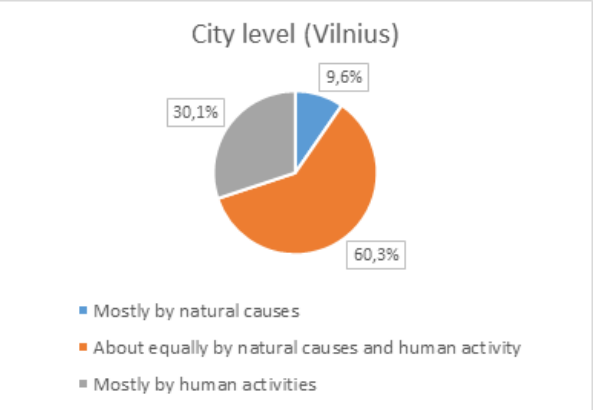


Figure LT10: Cause of climate change

4.1.7.3 Assessment of energy behaviour/attitude related results with respect to themes and subthemes

A considerable part of the ECHOES survey deals with the respondents' energy behaviour and their attitudes towards energy related topics. The opinion, that the use of more renewable energy sources (RES) will benefit the environment is stronger among respondents from Vilnius compared to the country level assessment (almost 85% of respondents moderately or strongly agree with this statement at the city level, while at the country level this number is only 77.5%). The proportion of disagreeing respondents is almost the same – around 7% both county and city level (see Figures LT11 and LT12).

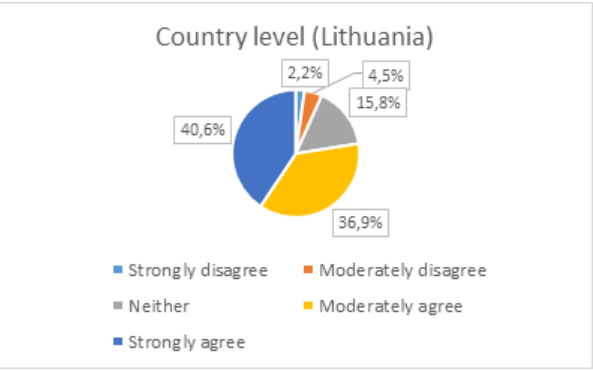


Figure LT11: Renewable energy sources benefit the environment

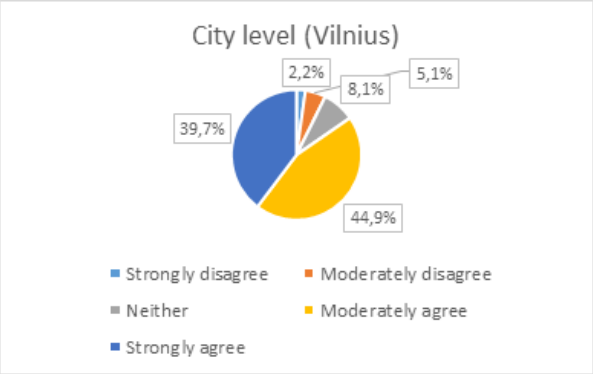


Figure LT12: Renewable energy sources benefit the environment

When asked if the use of more renewable energy sources would create new jobs, 46% of respondents at the country level is uncertain, the proportion at the city level is slightly lower – 41% (see Figures LT13 and LT14). Among those who moderately and strongly agree with this statement the proportion is higher at the city level (about 46% compared to almost 41%). This means that the respondents at the country level are considerably less certain about the creation of new jobs while benefiting for the environment with the use of more renewable energy sources, the situation seems more optimistic for respondents from Vilnius.

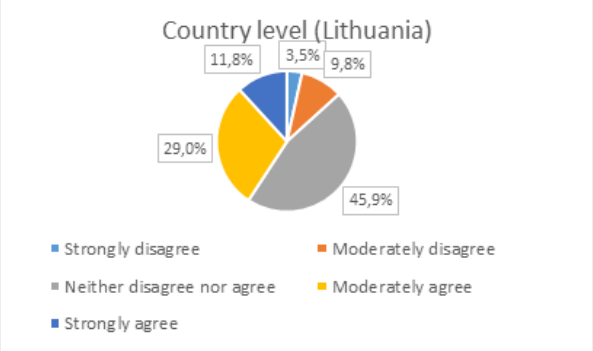


Figure LT13: Renewable energy sources create new jobs

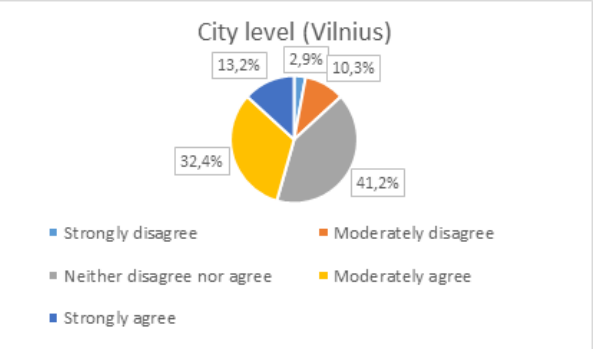


Figure LT14: Renewable energy sources create new jobs

Questions about energy policies depict slightly different results. Figures LT15 and LT16 show the acceptance of energy policies that protect the environment but induce higher costs. Less than half of the respondents agree or strongly agree with the statement, the proportion is bigger at the city level (44% compared to 42.5%), about a third are undecided and more than 26% moderately or strongly disagree on both levels of assessment.

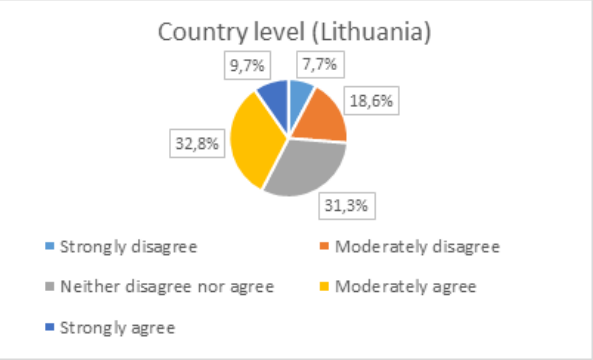


Figure LT15: Policies that protect the environment

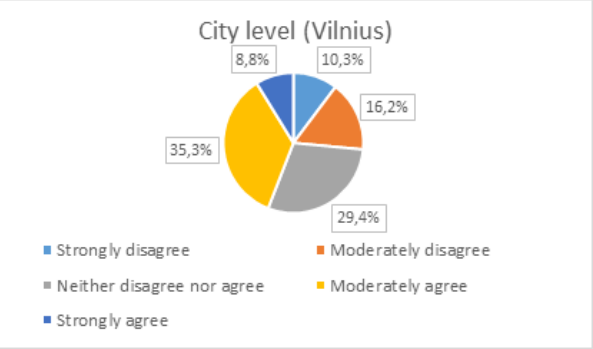


Figure LT16: Policies that protect the environment

Figures LT17 and LT18 show the acceptance of energy policies that would create new jobs but induce higher costs. About half of the respondents (namely 49% at the country level and 46% at the

city level) agree with this statement. This indicates that higher costs generally find acceptance, especially in the country level context, even though there is considerable uncertainty. Further, while policies that create new jobs despite higher costs find stronger acceptance, the use of more renewable energy sources is not necessarily strongly believed to create new jobs.

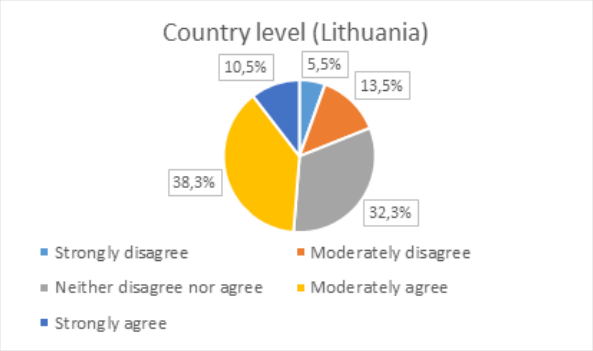


Figure LT17: Policies that create new jobs

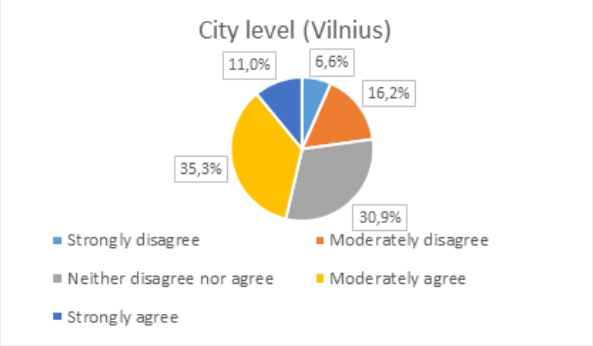


Figure LT18: Policies that create new jobs

These partly mixed attitudes toward energy topics seem to translate to real actions in a relatively positive way. Respondents were asked whether they were interested in the possibility of a real investment in renewable energy. If so, their email address was to be forwarded to respected companies that offer community-based investments in green power. Further, their email would be used to send them investment opportunities, while respondents could withdraw their confirmation to receive such offers at any time. The results above would suggest that likely less than half of the respondents might be interested in such an opportunity. The results show that 39% are interested in the possibility of a real investment in renewable energy. To sum up, the sample shows a moderately strong acceptance of the benefits of renewable energy sources and of higher costs induced by energy policies.

4.1.7.4 Assessment of lifestyle-related results with respect to themes, subthemes, and focal areas

A central part of the ECHOES database sheds light on lifestyle-related topics and gives valuable insights into energy-related every-day actions and opinions. Figures LT19 - 22 shows that on both assessment levels, only about 39% of the respondents agree that each individual can do much to support the energy transition. However, the share of respondents who think that together people can support energy transition is significantly bigger - 57% - 58% on both country- and city-level. The overall results are pointing towards the importance of collective actions.

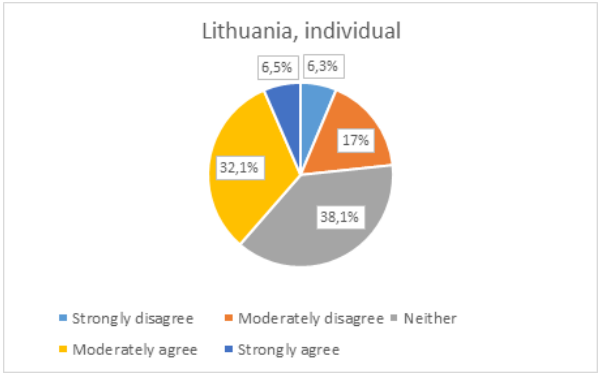


Figure LT19: I can do a lot to support the energy transition.

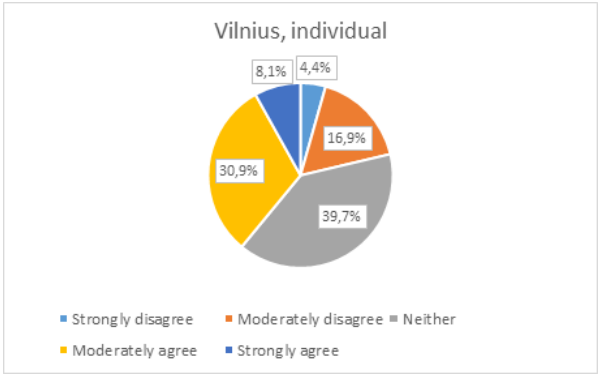


Figure LT20: I can do a lot to support the energy transition.

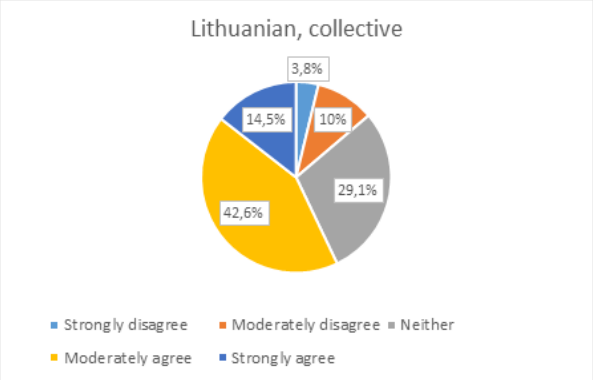


Figure LT21: We as people can act together to achieve the energy transition.

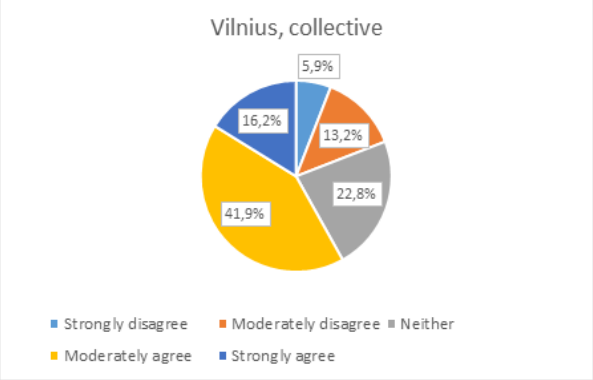


Figure LT22: We as people can act together to achieve the energy transition.

Even 73% of respondents from Vilnius feel a personal obligation to be energy efficient and more than 49% of them would behave more environmentally friendly if most other people do it. At a country level assessment, the share of respondents who feel personal obligation is 4% lower, but the share of people who behave more environmentally based on other people's behaviour is almost 4% higher. These results indicate that people in Vilnius are more aware of environmental issues and feel the need to contribute personally, while the overall situation in Lithuania is less positive and people are more likely to act as the majority acts.

Decreasing energy consumption for heating and cooling the dwellings is one of the ECHOES database topics within the energy transition theme. At a country level, the biggest share of respondents agree that the energy transition could be done through consumption decrease for heating and cooling of their dwellings (almost 19%). About 20% of respondents on both assessment levels (21% at the country- and 20% at the city level) agree that other people support them in decreasing their energy consumption this way and feel an obligation to do so. However, at a city level the belief in support is slightly lower while the feeling of obligation is slightly stronger. Probably because of this support and obligations felt mismatch, respondents from Vilnius express higher satisfaction if they decreased energy consumption for heating and cooling their dwelling by 10% over the next year – more than 19% answered they would feel mostly or very proud. Among all the respondents the share of mostly and very proud is lower (about 17%). 15% of all respondents agree that the growing number of residents have decreased their energy consumption for heating and cooling their dwellings. Among Vilnius respondents, this belief is lower –13% agreed with the statement.

The option of allowing the grid operator to remotely switch on and off non-critical appliances in homes is another topic assigned to the energy transition theme. This topic is mainly relatable to respondents from Vilnius – the biggest share of respondents from Vilnius (17%) answered they strongly and moderately agree allowing the grid operator to remotely switch on and off non-critical appliances would benefit the energy transition. 15% feel a personal obligation to allow the grid operator to remotely switch on and off non-critical appliances in their homes and they would allow it if offered an annual discount. Among all respondents this share is lower, less than 14%. About 20% of respondents on both national and city level stated that they would feel proud of doing so, at the Vilnius city level the part of proud respondents is almost 1.5% higher. These results show that Vilnius residents are more likely to allow grid operators to perform such actions as they believe it is an important part of the energy

transition in comparison to the same question in the national context.

Buying electric bicycles seems the least important aspect for energy transition for respondents on both assessment levels – only 11% of all respondents from Vilnius agree that buying electric bicycles would benefit the energy transition topic and the same share would feel proud to do so. Less than 3% intend to buy (strongly agree) or already have the electric bicycle. The share among respondents at the country level is 2% bigger on all the topics discussed above, which shows that at the country level people see slightly bigger potential for electric bicycle use, presumably because of the larger distances and issues related to regular bicycles for everyday commute.

Mobility-related lifestyles – also an important part of the energy-lifestyles of individuals. Figure 5.164 displays various public transportation related results. Almost 45% of the respondents from Vilnius are (very) satisfied with the public transportation system in their area, which is almost 7% higher than the result at the country level. About 3% of all respondents from Lithuania also stated that they have no public transportation in their area, while among Vilnius citizens there were no such answers. Dissatisfaction level is about 17% at both levels of the assessment.

Despite the recently significantly updated public transportation fleet and trolleybuses in Vilnius, none of the respondents from Vilnius strongly agreed that the public transportation in their area is environmentally friendly and only about 18% moderately agreed with the statement. The biggest share of the respondents neither agree nor disagree (46%), 35% (strongly) disagree. The overall situation at the country level assessment is more opinionated – less unsure respondents and more agreeing or disagreeing (e.g., almost 2% of all respondents from Lithuania strongly agreed that public transportation in their area is environmentally friendly).

The indicator of number of trips by public transportation is very illustrative – more than half (53%) of respondents from Vilnius rarely use public transportation (even though this indicator includes travels to work or for shopping), another 16% make 1 – 2 trips per week, other shares are the smaller the more trips per week the respondent makes. However, there are more representative surveys for mobility modal split in Vilnius and that dataset would show a more sustainable picture (more than 20% of citizens use public transportation on a daily basis). Country-wide the situation with public transportation usage is even worse (68% of respondents rarely use public transportation, other options for answering this question showed results 4% lower than at the city level on average). This clearly illustrates the city – and nation-wide public transportation system gaps and lack of public transportation-oriented behaviour among Lithuanian citizens.

The question regarding which type(s) of public transportation the respondents use as part of their routine mobility is not suitable for Lithuania as there are no underground, tram or 'streetcar' services at all. In Lithuania, car sharing, bicycle and scooter sharing systems are widely developed in the biggest cities, however it is not clear whether these can be perceived as street cars. The same question remains with trolleybus usage in Vilnius and the second-largest Lithuanian city, there is a question whether respondents using this mode indicated it as a bus or did not indicate it all. Thus, the results of this indicator are questionable as some of the respondents chose officially non-existing public transportation types. When answering this question, the respondents were allowed to select multiple answers. Accordingly, the most popular type of public transportation seems to be busses (79% at the city- and 73% at the country-level assessment), the train is in second place (about 18%). This result illustrates the overall situation – road network and road PT services are much more developed and adjusted to daily mobility than the

rail network and PT services on this network. see Figures LT23 – 30.

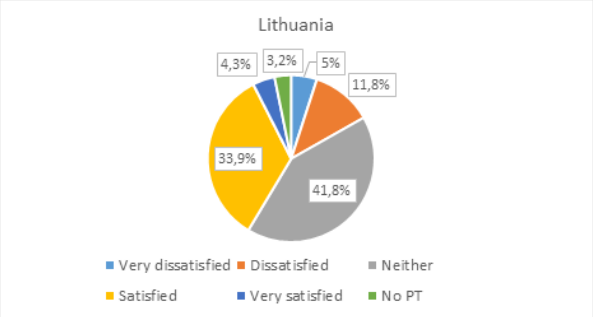


Figure LT23: Satisfaction level of respondents on current public transportation system

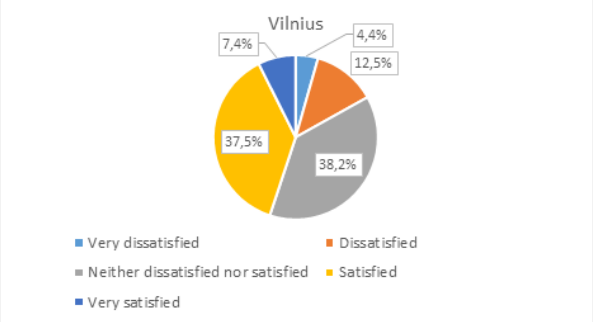


Figure LT24: Satisfaction level of respondents on current public transportation system

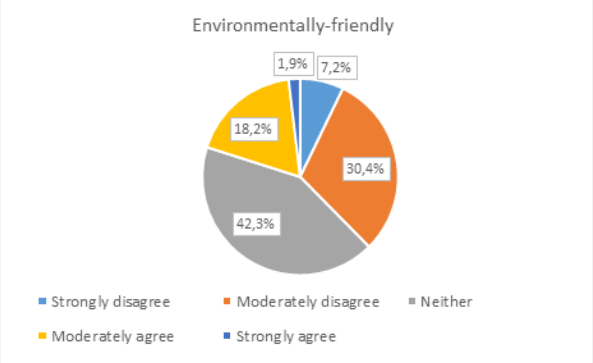


Figure LT25: The public transportation system in my area to be environmentally friendly

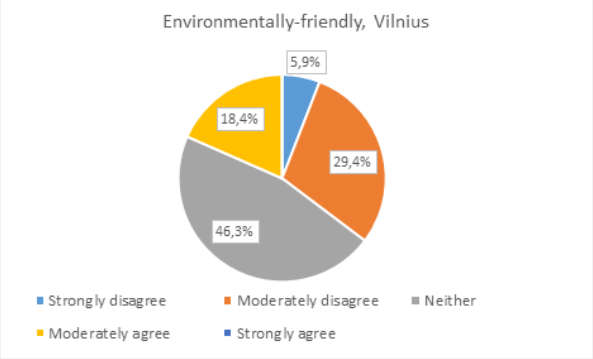


Figure LT26: The public transportation system in my area to be environmentally friendly

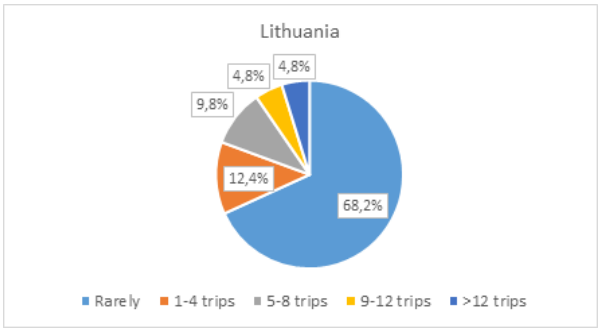


Figure LT27: Trips per week by using public transportation on average

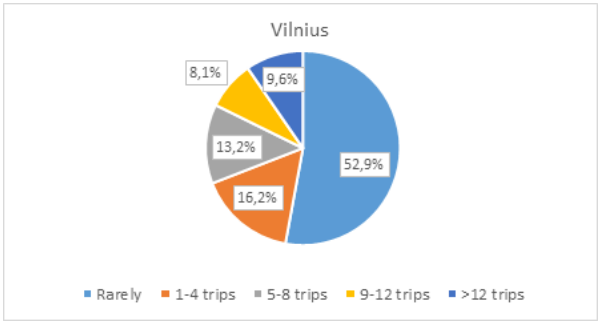


Figure LT28: Trips per week by using public transportation on average

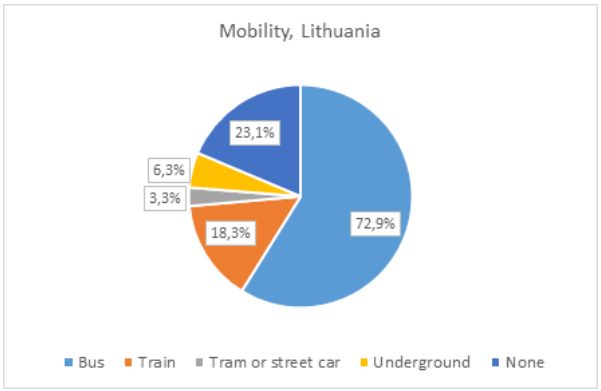


Figure LT29: Type(s) of public transportation use as a part of routine mobility

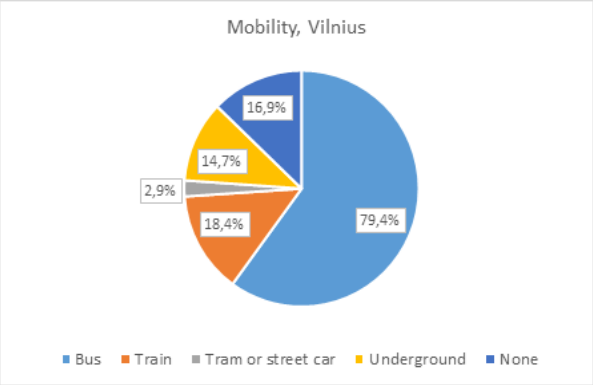


Figure LT30: Type(s) of public transportation use as a part of routine mobility

And finally, according to the ECHOES survey, 17% of the respondents do not use any of the public transportation possibilities routinely in Vilnius, at the country level the result is sadly even 7% higher. National and city household surveys show better usage and acceptance of sustainable transport modes (at least in the biggest cities).

Regarding private transportation, a certain share of respondents (14%) does not drive any kilometre with a car as a driver per year in Vilnius (even though this indicator includes driving to work and etc.), which is 2% higher as compared to country-wide results. 21% are driving between 5 to 10 thousand kilometres per year and another 22% between 10 to 15 thousand kilometres. Again, these results are higher than country-level statistics (21% and 19% respectively). The exact distribution of answers is illustrated in Figures LT31 and LT32.

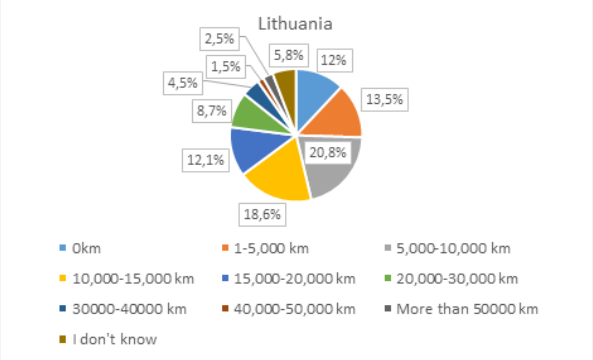


Figure LT31: Kilometres per year

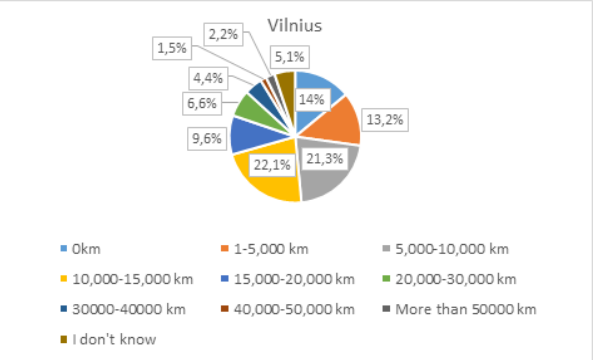


Figure LT32: Kilometres per year

As Figure LT33 and LT34 show, driving alone in one's car is the most popular choice in both Vilnius and Lithuania. Among Vilnius respondents, more than 46% drive alone very often or almost always, and another 25%, half the time. Only 11% almost never drive alone in their car. Country-wide results are quite similar. About one third of drivers drive alone, and almost half of them – together with one person.

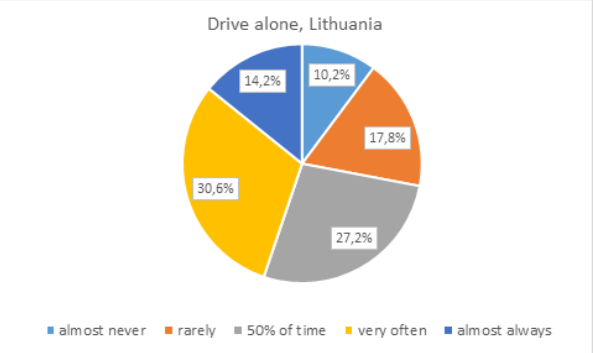


Figure LT33: Driving alone (Lithuania)

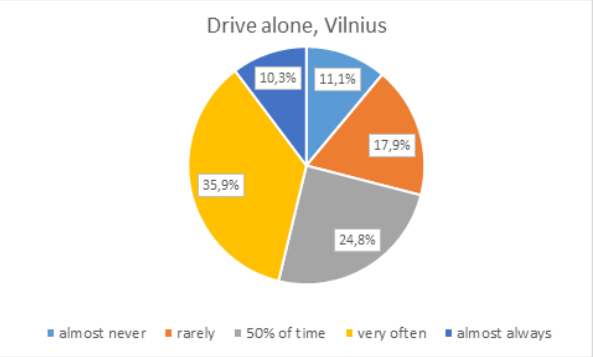


Figure LT34: Driving alone (Vilnius)

Trips with 3 people in a car are significantly rarer (less than one fifth of respondents chose this option), more than 4 people option is very rare

(about 5% in Vilnius and 8% country-wide). (see Figures LT35 and LT36).

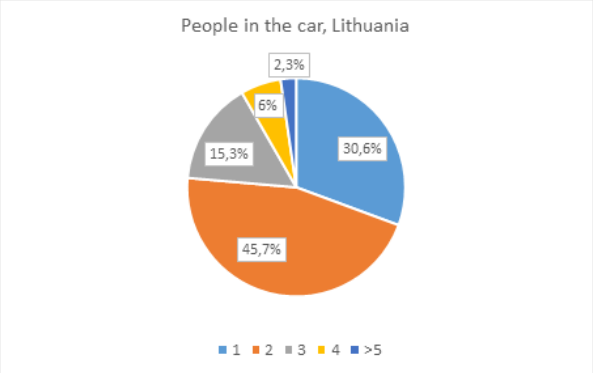


Figure LT35: People in the car

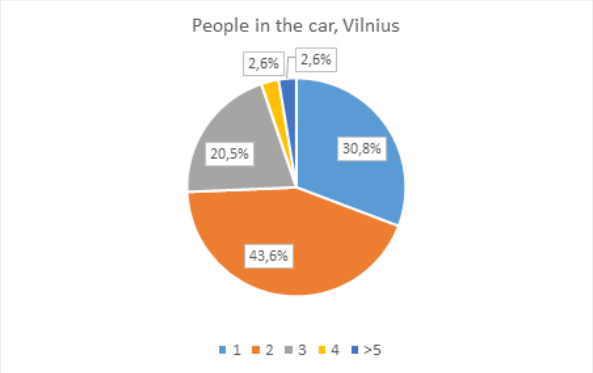


Figure LT36: People in the car

As presented in Figures LT37 and LT38, the most popular type of the private car in both Vilnius and Lithuania are diesel-propulsion cars (52% among Vilnius respondents and almost 56% among all the respondents from Lithuania). The second most popular type is petrol propulsion; this option was chosen by about 26% of respondents on both assessment levels. Hybrid-electric, plug-in hybrid and fully electric cars all together were the choice only of 9% of respondents from Vilnius and 6% of all respondents (and again - both indicators are quite bigger than national statistics showed at that time (dated 2019).

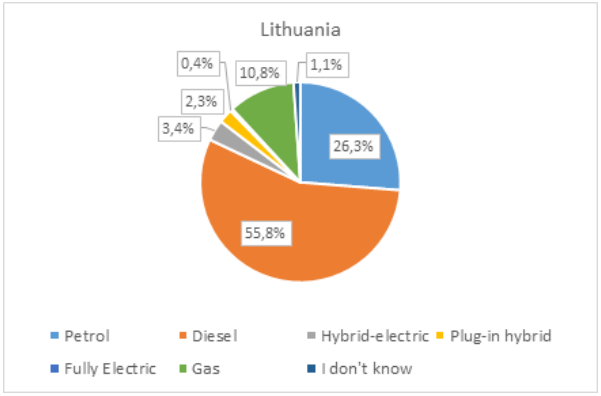


Figure LT37: Popular type of the private car

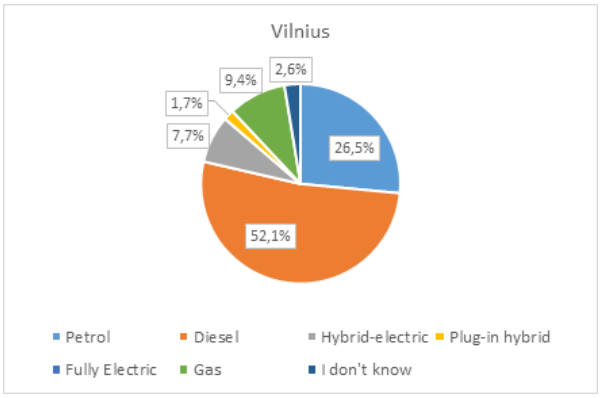


Figure LT38: Popular type of the private car

Regarding fuel consumption, the biggest part – 40% at the city level and 47% at the country level – belongs to cars with 5 – 7 l per 100 km consumption, almost every third indicated 7- 10 l per 100 km category. Cars with lowest consumption are in the third place – almost 16% of respondents from Vilnius chose this answer. At a country level this indicator is lower by 2%. The identified situation shows big potential for environmentally-oriented actions towards the existing car fleet. (see Figures LT39 and LT40).

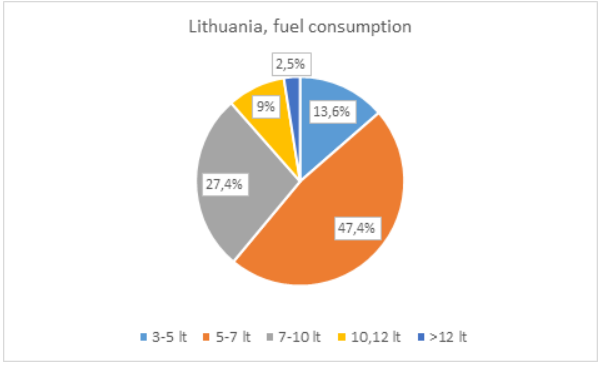


Figure LT39: Fuel consumption per 100 km

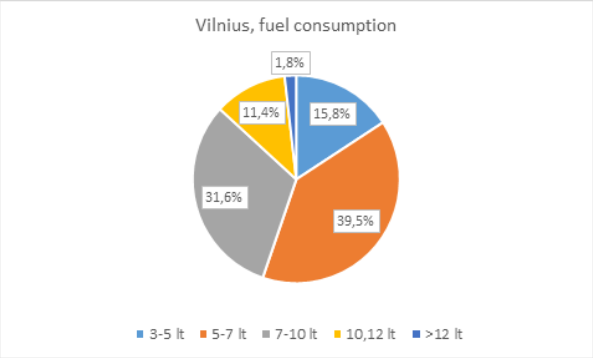


Figure LT40: Fuel consumption per 100 km

Car sharing from this survey seems to be not a popular option among respondents from Lithuania. Almost 79% of respondents from Vilnius indicated that they have never tried car-sharing, despite it being a very accessible option for commuting. In total 40 % are interested in the possibility of trying this service, 19% tried and liked it, only 2% tried and did not like it. The results show high potential for the car sharing services as the overall perception is quite positive. But in fact, e.g. in Lithuania there are two car sharing operators (one of the operators provides only electric cars, another not only) with more than 400000 users registered (15 % of whole population), thus ECHOES results showing that 4/5 of respondents had never tried this service are questionable.

Almost 82% of respondents do not ride a motorbike or scooter at all at a city-level, at a country-level this proportion is even higher by 1%. Among those who use this type of transportation for commuting, only 8% have electric vehicles (country-wide – 6%). The biggest share – about a fifth - of scooter users use vehicles with 4 – 5 l per 100 km fuel consumption.

Bicycle use is another important domain of private transportation. Figure LT41 reveals that 54% of all the respondents almost never use their bicycle to go to work or to do shopping. Among respondents from Vilnius this share is even higher by 2%, despite potentially suitable distances and constantly developing infrastructure, as illustrated in Figure LT42. Around another 34% use their bike somewhat regularly for work and shopping in good weather conditions, with only 10% using a bicycle all year long. The results of the country-level assessment are very similar to Vilnius city results. Overall bicycle usage results show the potential to encourage people to use bicycles as a means of daily commute.

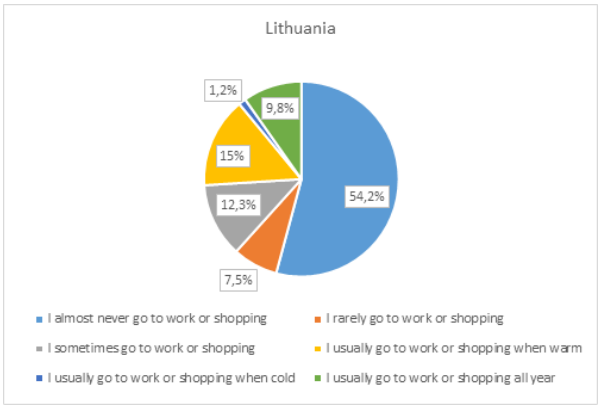


Figure LT41: Q90. Bicycle use

Figure LT42: Q90. Bicycle use

Electric bicycles might be an option for those who do not choose a bicycle because of health conditions, terrain or distances. As it was presented previously, respondents do not think buying electric bicycles could improve the situation in the energy sector much. This perception is continued in further questions related to electric bicycles. The biggest share of respondents has no opinion (neither agree nor disagree) on most of the questions related to buying electric bicycles and similar. However, 40% of respondents from Vilnius (strongly) agree that a growing number of people will buy electric bicycles within the next five years and even 57.5% (strongly) agree that this number will grow as soon as the current obstacles are removed.

Among all the respondents from Lithuania this belief is lower by about 4% as compared to that of Vilnius.

Figures LT43 and LT44 show that 30% of respondents on both levels of assessment agree that they intend to purchase an electric bicycle within the next five years and only 3% own an electric bicycle at the country-level, considering the strong interest, an uptake of this rate might offer a reasonable possibility to decrease kilometres driven by car and increase the usage of bicycles for work and shopping travels.

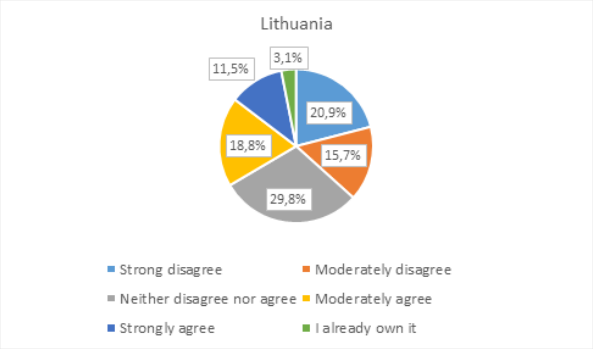


Figure LT43: Electric bicycle

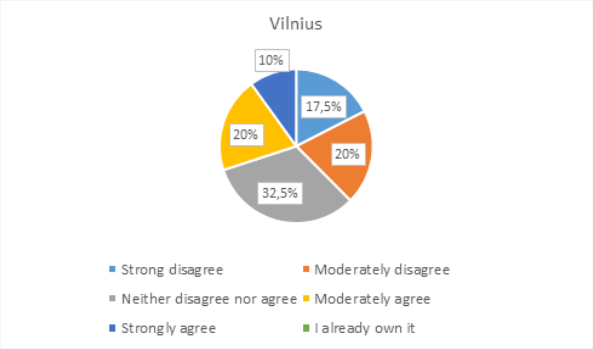


Figure LT44: Electric bicycle

Another means of commute that has a significant impact on the environment are flights. Most of the respondents from Vilnius – almost 60% - took no business trips during the past year. 16% took 1 – 2, 18% - 3 – 4, 7% - 5 or more business trips. City-level statistics are higher than country-level results; almost 69% of all respondents took no business trips by plane last year. The overall level of business trips by plane is quite low in Lithuania, however, there is room even to reduce the share of these trips and promote other means of transport for this cause (e.g., the upcoming RailBaltica project).

Another flight-related question – "About how many hours have you spent on private flights during the last year?" more than half of all respondents responded that they had private flights last year and about a third spent between 3 and 10 hours.

A large part of surveying energy-lifestyle is meant for decisions related to the households. 62% of respondents from Vilnius live in the flats (the result at a country-level is 6% lower), 23% in single family homes (15.5% more at the country-level), 10% in a farmhouse and 4.5% - in semi-detached houses. About 2/3 of households have less than 110 sq. m. space, the biggest share – quarter – is 51 -70 sq. m. Also, about 2/3 of households are in buildings that were built between 1961 and 2000. 23.5% of respondents from Vilnius live in houses built after 2000, this share is lower country-wide by almost 8%. As seen in Figures LT45 and LT46, there were no energy efficiency renovations made in 55% of the dwellings of respondents from Vilnius. The situation is clearly much better at the country-level. Thus, this is a very good opportunity for Vilnius to improve the efficiency of buildings and to contribute to the environment.

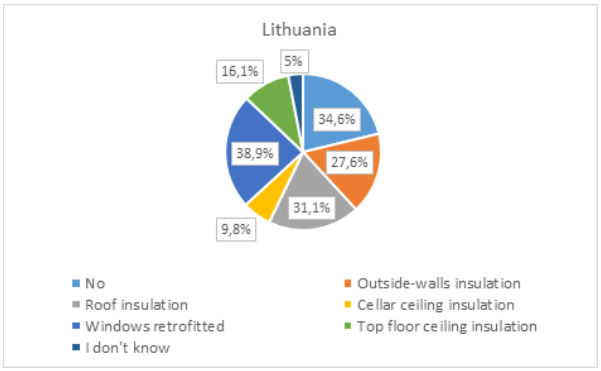


Figure LT45: Energy efficiency renovations

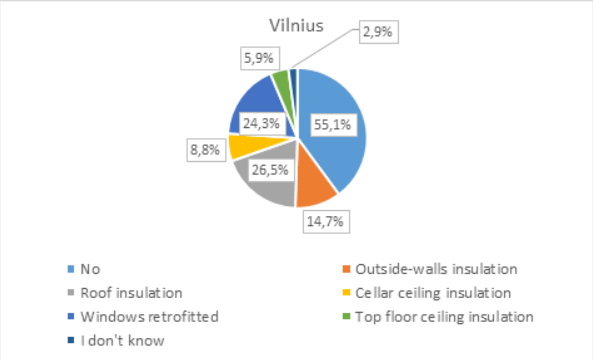


Figure LT46: Energy efficiency renovations

Figures LT47 – 54 present several important issues. Regarding heating, 42% of the respondents from Vilnius have a central heating for the whole dwelling and 38% district heating to several houses, which is about 4% higher than overall Lithuanian results. The share of respondents who has hot water provided by district heating is even higher (almost 57% in Vilnius and 48% overall). Only 3% have hot water from solar-thermal energy. On the country level these 3% are split between solar- and geo-thermal energy. 80% of respondents have a bathtub, however, more often they choose taking a shower (56% at the city-level assessment and 59% at the country-level assessment). The overall situation provides wide opportunities to switch to more sustainable energy usage for daily needs. (see Figures LT47 and LT48).

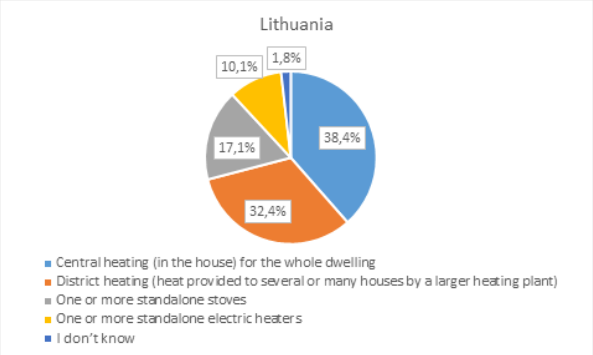


Figure LT47: Heating

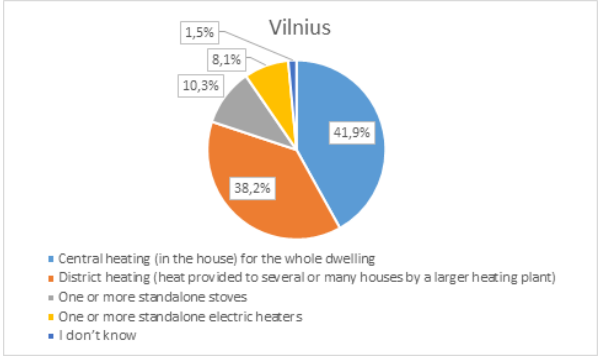


Figure LT48: Heating

Regarding air conditioning, the majority (65%) does not own an air conditioner or almost do not use it and about 24% of respondents use it sometimes or often. The savings potential seems rather small in this case. (see Figures LT49 and LT50)

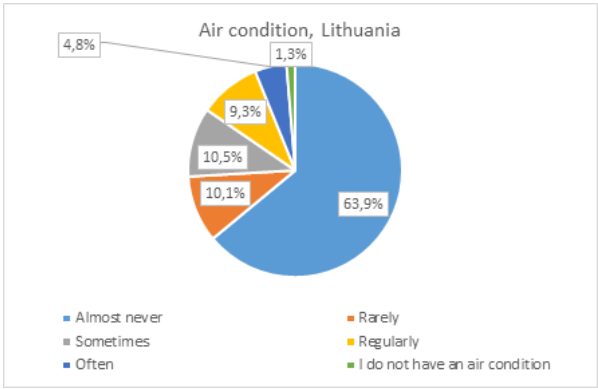


Figure LT49: Air condition use

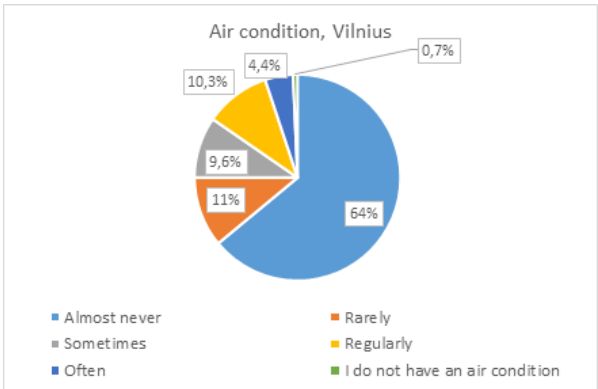


Figure LT50: Air condition use

29% of Vilnius respondents often or always disconnect electric appliances when not in use. This is very low compared to results from all Lithuanian-pool where the share is 41%. 16% never do it (again – at the country-level the situation is

slightly better: 12%). This result is providing an easy and affordable opportunity for households to lower their electricity consumption and contribute energy efficiency. 3/4 have all or mainly use energy saving light bulbs. (see Figures LT51 and LT52)

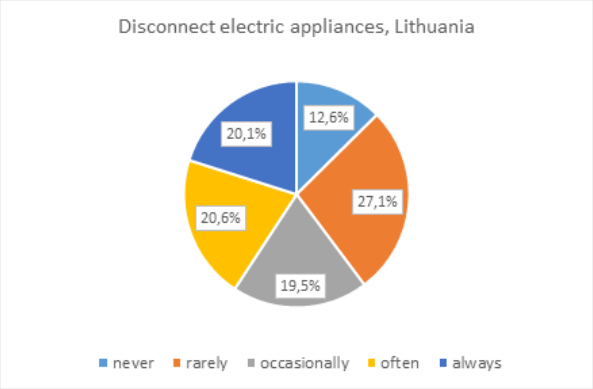


Figure LT51: Disconnect electric appliances

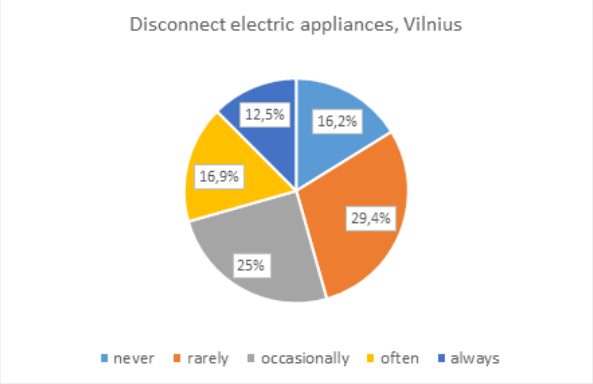


Figure LT52: Disconnect electric appliances

Regarding electricity provider's share of renewables (RES), more than half have no information on this topic, and only 8% answered that their provider has a high share of RES. A certain share of customers might switch to a provider with a higher share of renewables when they are better informed. (see Figures LT53 and LT54)

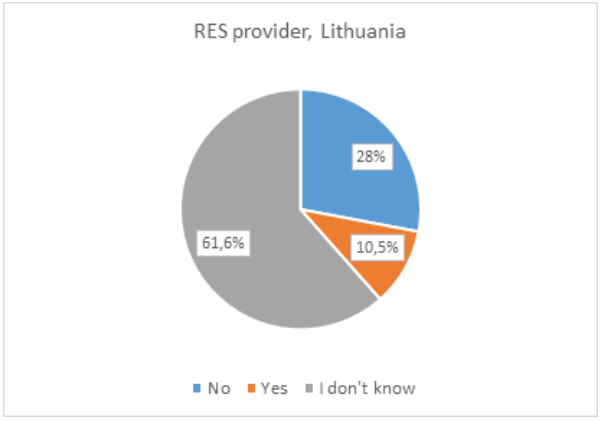


Figure LT53: Purchase electricity from green provider

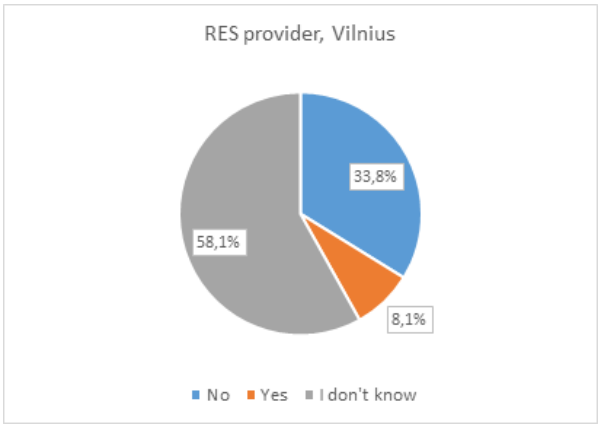


Figure LT54: Purchase electricity from green provider

34% of respondents from Vilnius have 10 or more hot meals per week, 42% have meat in all meals, another 45% - in some meals. On a national scale the number of hot meals is quite similar, but the share of meals with meat in some meals is 4% lower. The identified dietary habits show the potential to switch to a healthier and less harming lifestyle.

Regarding other lifestyle choices, respondents mainly choose hobbies with moderate to little equipment and infrastructure needed (93%), about half of them have long use, second hand, modest preferences in fashion, only about 7% choose new and highly fashionable clothes quite often (at a country level – almost 11%). Preferences in purchasing electronics are also quite efficient – 60% choose long use electronics and replace them only if broken, 30% think their preferences are about average. About 7% choose the option of new equipment and latest technology. Again – at

the country-level this share is higher – 11%. The results show that respondents from Vilnius are quite oriented to an efficient, not trendy lifestyle. The same opportunity is present in the topic of electronics usage: 35% use electronics (very) intensively, another 40% - about average (at the country-level even 44%). A big part of respondents – 58% - (strongly) agree that they consider how things might be in the future and try to influence those things with their day-to-day behaviour. This leads to the conclusion that those who think their preferences are about average and could be persuaded to change their behaviour towards more sustainable choices.

4.1.7.5 Interim Conclusion and Suggestions

In terms of age and education, Vilnius sample presents a relatively young and highly educated group of employed individuals living in a city with a solid self-perceived social standing. Climate change is the topic acknowledged by most of the respondents, however human made climate change has only moderately strong acceptance. The majority believes that the use of more renewable energy sources will benefit the environment, as a result, energy policies find a moderately strong acceptance. These attitudes are backed by a relatively strong interest in a real investment in renewable energy.

Lifestyle assessment results show considerable room for improvement in the public transport system, private car fleet and housing energy efficiency. Other sources of potential savings lie in changing people's behaviour and perception: many people drive alone in their cars, do not switch electric appliances, and are under-informed about their electricity provider. The group behaviour seems to be of higher importance than the individual in achieving changes.

Based on this assessment, the suggestions for further work would be:

- Increase usage of public transportation by improving mobility management measures (information and encouragement);
- Incentivize citizens to shift from private car users to a more collective transport behaviour;
- Educate on the benefits of renewables and the environmental impact;
- Initiate better accessibility of the information about electricity providers;
- Continue promotion about benefits of housing renovation processes;
- Educate on the benefits of energy-related lifestyle changes.

4.1.8 Sweden

4.1.8.1 Demographics

The ECHOES database includes 603 respondents from Sweden. Due to a small number of city specific respondents, the assessment of the ECHOES data is done on the country level.

Of all respondents from Sweden, 49% are male and 74% live in an urban area, namely a town or city with more than 10 000 inhabitants. Most of the respondents are between 18 and 34 years old (35%), approximately 20% fall in each of the remaining three age categories (see Figure SE1).

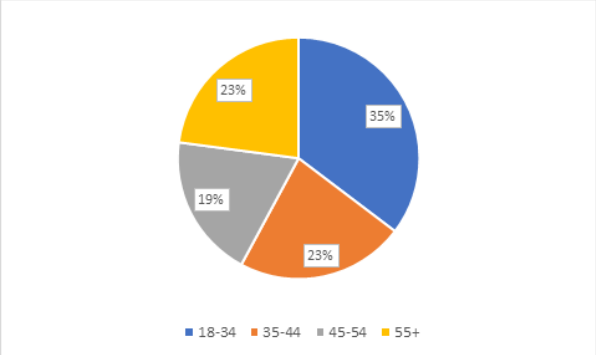


Figure SE1: Respondents by age

58% of the respondents are employed, around 20% are retired, 8% students and 7% unemployed. As indicated in Figure SE2, educational attainments in the sample are high with 39% tertiary education, 10% A-levels (qualification for university) and 16% with a professional training in practical skills. However, 34% attained only up to secondary education.

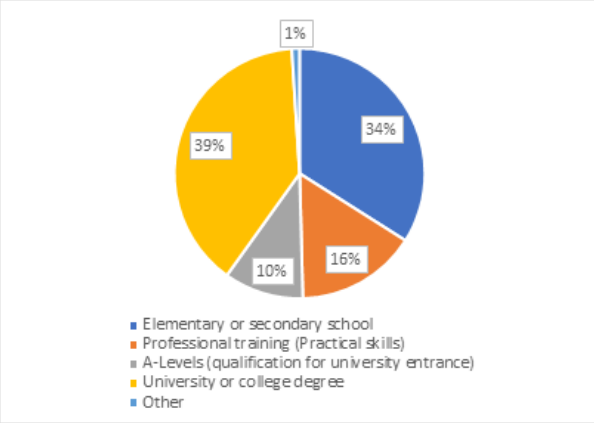


Figure SE2: Respondents by education level

Figure SE3 shows how respondents place themselves on a subjective social ladder, with 1 indicating being at the lowest level and relatively speaking worst off and 5 being at the highest level and best off. While the most (48%) place themselves in the middle, in total, 77% place themselves in the middle or higher and only 7% feel they are socially the worst off in the society. All in all, the sample presents a relatively young, highly educated group though including a considerable share of lower educated, mainly living in cities and with a solid self-perceived social standing.

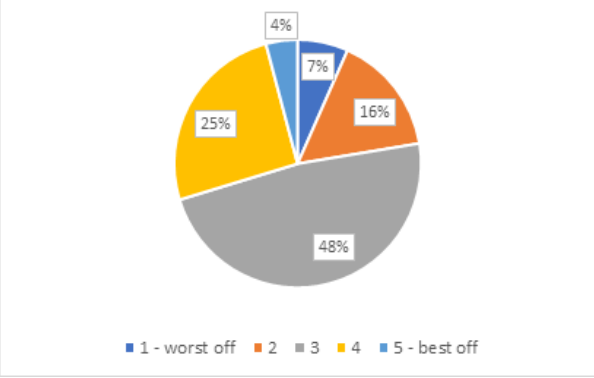


Figure SE3: Respondents by perceived social status

4.1.8.2 Assessment of climate change-related results with respect to themes and subthemes

Two questions directly relate to climate change. As Figure SE4 shows, most respondents (51%) agree with the statement that the world's temperature has gradually been rising over the past 100 years as most scientists state. Only around 4% disagree and 15% are not sure.

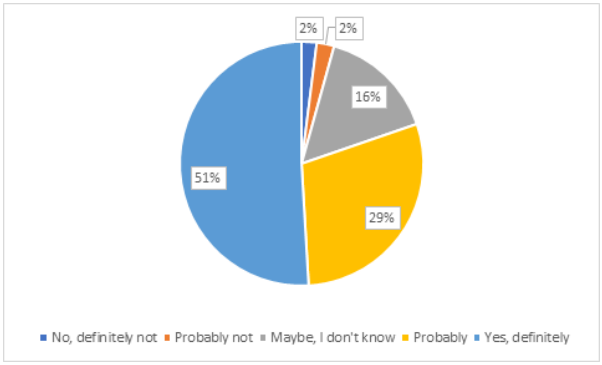


Figure SE4: Climate change

And when asked what the cause of climate change is, assuming the temperature is rising, more than half of the respondents (53%) think that climate change is mainly caused by human activities and only 10% think that it is mainly due to natural causes (Figure SE5). These results indicate a strong acceptance of human made climate change in our lifetime.

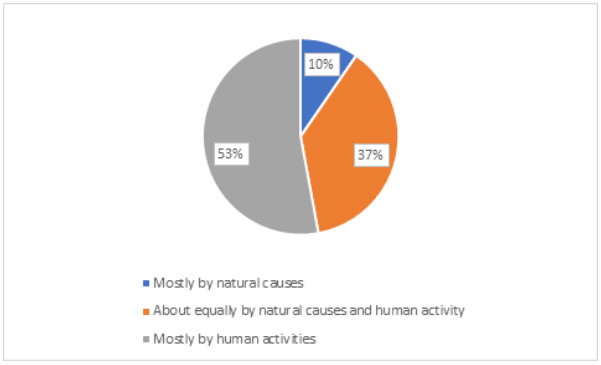


Figure SE5: Cause of climate change

4.1.8.3 Assessment of energy behaviour/attitude related results with respect to themes and subthemes

A considerable part of the ECHOES questions deals with respondent's energy behaviour and their attitudes towards energy related topics. 51% of the respondents strongly agree that the use of more renewable energy sources (RES) will benefit the environment and another 29% agree moderately (Figure SE6). Only around 5% do not think that using more RES benefits the environment.

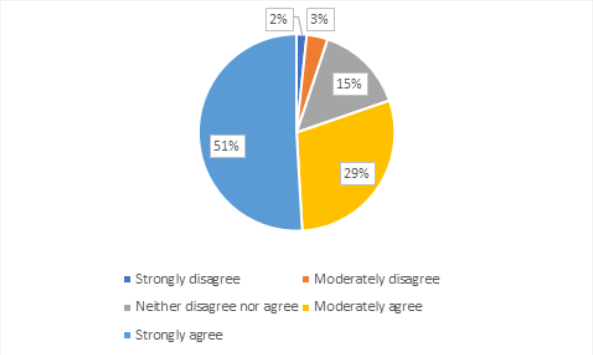


Figure SE6: Renewable energy sources benefit the environment

When stating that the use of more renewable energy sources will create new jobs, 32% agree moderately (Figure SE7). However, only 17% strongly agree and 42% are uncertain. This means that the respondents are less certain about the creation of new jobs than the benefits for the environment.

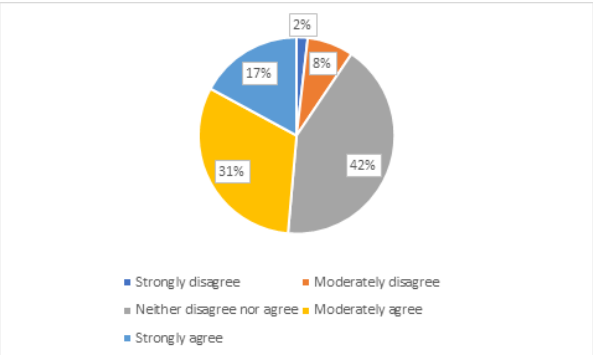


Figure SE7: Renewable energy sources create new jobs

Questions about energy policies depict slightly different results. Figure SE8 shows the acceptance of energy policies that protect the environment but induce higher costs. Less than half (45%) of the respondents agree or strongly agree with the statement, 26% are undecided and 30% disagree.

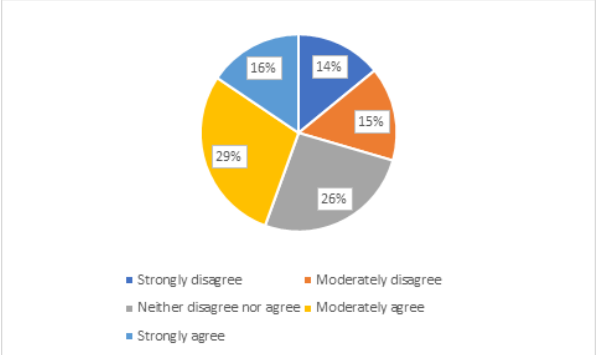


Figure SE8: Policies that protect the environment

Figure SE9 shows the acceptance of energy policies that create new jobs but induce higher costs. The distribution of the answers is similar as in Figure SE8, just less than half of the respondents agree with the statement. This indicates that higher costs generally find acceptance, however, whether energy policies protect the environment or create new jobs seems of equal importance.

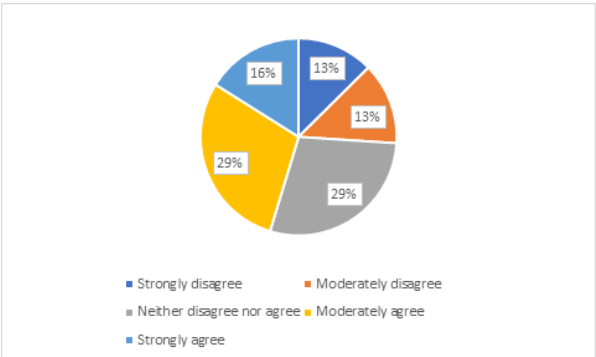


Figure SE9: Policies that create new jobs

However, these attitudes toward energy topics seem to translate to real actions only in a limited way. Respondents were asked whether they were interested in the possibility of a real investment in renewable energy. If so, their email address was to be forwarded to respected companies that offer community-based investments in green power. Further, their email would be used to send them

investment opportunities, while respondents could withdraw their confirmation to receive such offers at any time. The results above would suggest that approximately half of the respondents might be interested in such an opportunity. However, the results show that only 34% are interested in the possibility of a real investment in renewable energy. To sum up, the sample shows a relatively strong acceptance of the benefits of renewable energy sources and of higher costs induced by energy policies. These attitudes are however only supported to a limited degree by only a moderate interest in a real investment in renewable energy.

4.1.8.4 Assessment of lifestyle-related results with respect to themes, subthemes, and focal areas

A central part of the ECHOES database sheds light on lifestyle-related topics and gives valuable insights into energy-related every-day actions and opinions. Figure SE10 reveals that 54% agree that each individual can do much to support the energy transition. Further, 74% agree that people can act together to achieve the energy transition, pointing towards the importance of the collective but also of the individual (see Figure SE11).

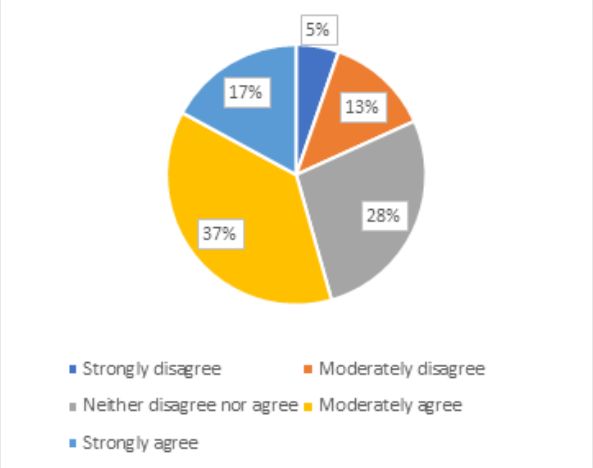


Figure SE10: I can do a lot to support the energy transition.

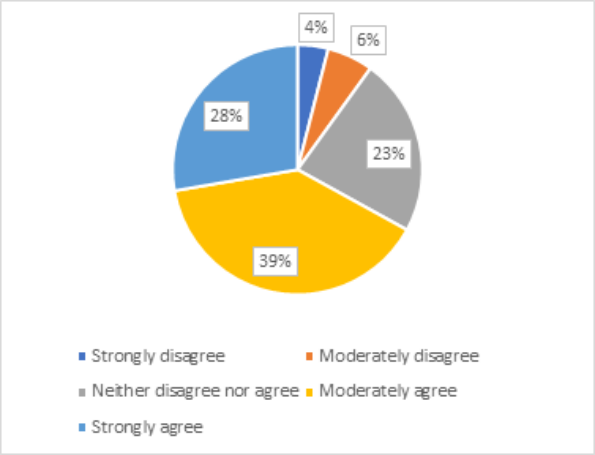


Figure SE11: We as people can act together to achieve the energy transition.

Public and private transport play an important role in the energy-life of individuals. Figures SE12 – 15 display various public transportation (PT) related results. Less than half of the respondents (46%) are satisfied with the local public transportation system and around 23% are dissatisfied (see Figure SE12). However, this indicator is especially dependent on location and might vary highly within a country. 43% agree that the public transportation system in their area is environmentally friendly. 43% are uncertain and 15% disagree (see Figure SE13).

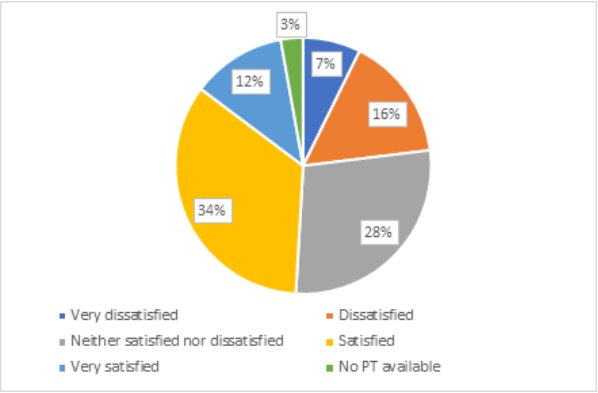


Figure SE12: Satisfaction level of respondents on current public transportation system

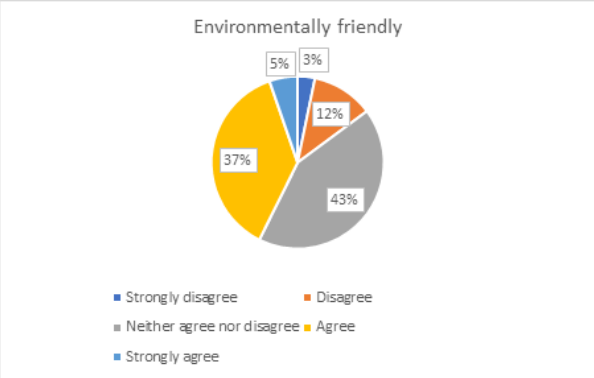


Figure SE13: The public transportation system in my area to be environmentally friendly

Looking at a specific number of trips using public transportation, it can be stated that public transportation seems to be relatively well but potentially underutilized. 51% of the respondents rarely use public transport on a weekly basis, even though this indicator includes travels to work or for shopping. 8% use it more than 12 times per week. These are likely to be individuals that commute using public transportation. (see Figure SE14) Lastly, the most popular type of public transport seems to be by bus with 55%, followed by train with 34% and underground with 19%. However, a third of the respondents do not use any of these routinely. Underground transportation in Sweden is only relevant in Stockholm (see Figure SE15).

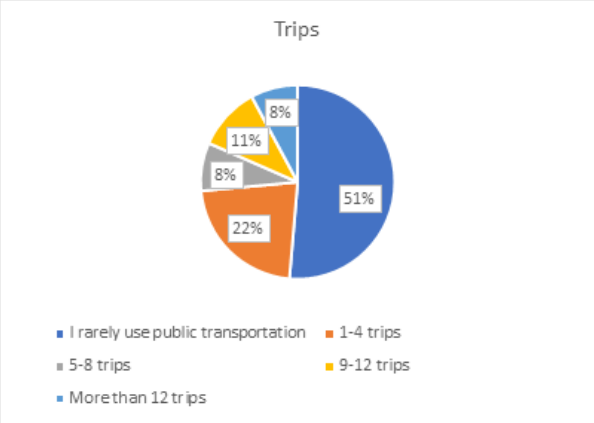


Figure SE14: Trips per week by using public transportation on average

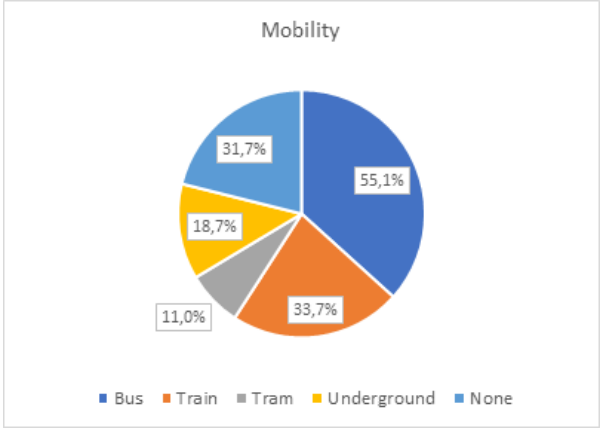


Figure SE15: Type(s) of public transportation use as a part of routine mobility

Regarding private transportation, a considerable share of respondents (23%) does not drive any kilometre with a car as a driver per year, even though this indicator includes driving to work, etc. Most respondents drive only a limited amount of km per year, with 19% driving between 1 to 5 thousand kilometres per year and another 18% between 10 and 15 thousand. The exact distribution is illustrated in Figure SE16.

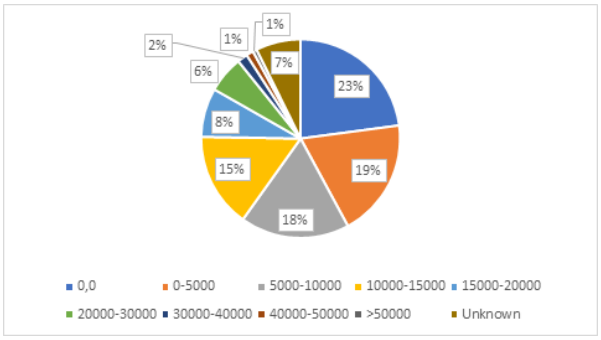


Figure SE16: Kilometres per year

As Figure SE17 shows, driving alone in one's car is a relatively popular choice, one reason might be that this includes commuting. 44% drive alone very often or almost always and another 12% half of the time. 14% almost never drive alone in their car. These results reveal a substantial energy saving potential in private transportation.

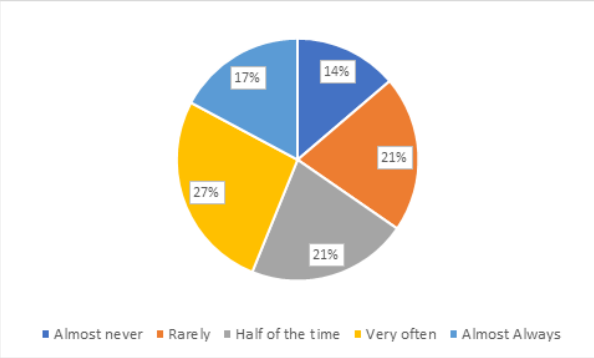


Figure SE17: Driving alone

This potential is somewhat supported by Figure SE18, which indicates that 92% of the respondents have never tried car-sharing. However, "only" a total of 32% is interested in the possibility. 2,2% have tried but did not like car-sharing.

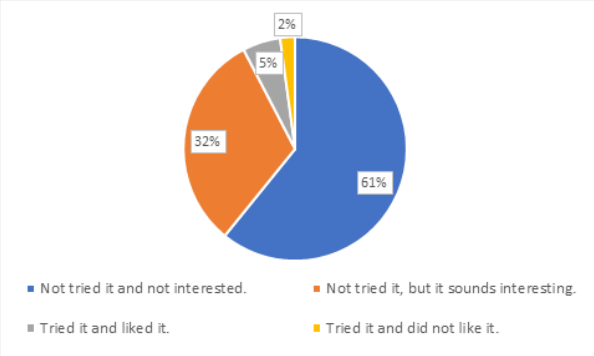


Figure SE18: Car sharing

Bicycle use is another important domain of private transportation. Figure SE19 reveals that 44% of the respondents almost never use their bicycle to go to work or to do shopping. This in turn means that around 56% use their bicycle somewhat regularly for work and shopping, with a considerable share of 20% usually using a bicycle for work and shopping all year long. While for many of these 44% it might be implausible to use a bicycle due to larger distances or weather conditions, the 56% indicate that it is possible for a large share of the respondents and thus offers a considerable potential for improvements. Overall, bicycle usage seems already quite strong.

Figure SE19: Bicycle use

Electric bicycles might offer an acceptable option for many. Figure SE20 shows that 20% agree that they intend to purchase an electric bicycle within the next five years and another 16% are undecided. However, 61% disagree. Since only 3,9% own an electric bicycle, an uptake of this rate might offer a possibility to decrease kilometres driven by car and increase the usage of bicycles for work and shopping travels since bicycle usage seems already popular in Sweden.

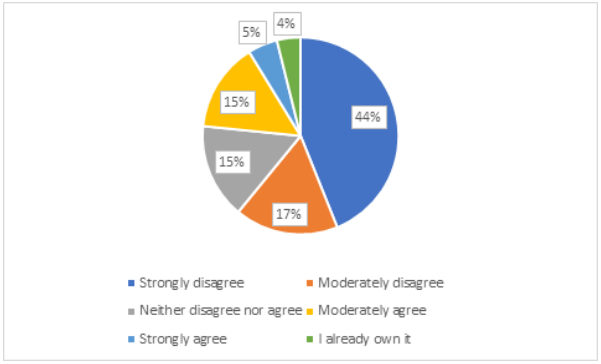


Figure SE20: Electric bicycle

A large part of energy-lifestyle is related to decisions in the houses. Figures SE21 - 24 present four important issues. Regarding heating, 59% of the respondents have a central heating for the whole dwelling and 12% district heating to several houses. The remaining answers consist of stoves, electric heaters or the respondents do not know their heating system.

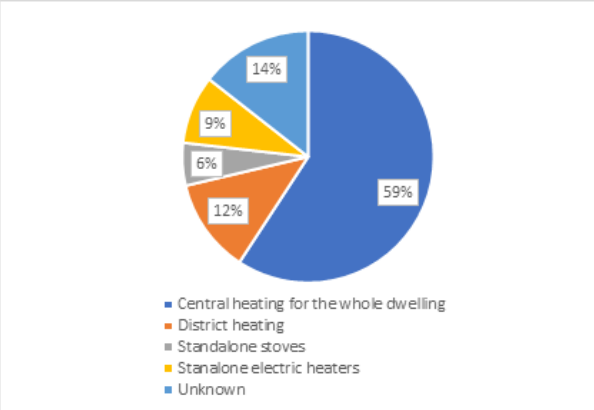


Figure SE21: Heating

Regarding air conditioning, with 69%, the majority does not own an air conditioner and about 5% use it regularly or often. The savings potential seems rather small in this case (see Figure SE22).

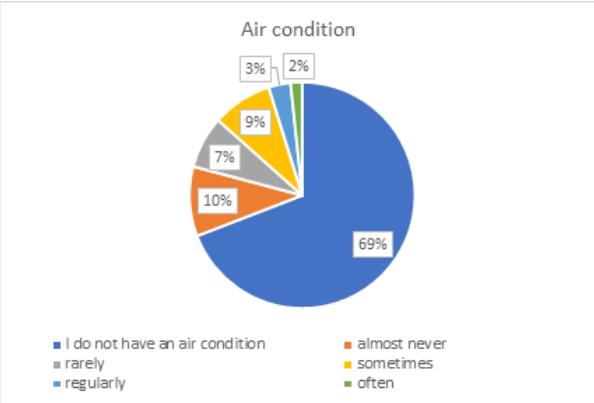


Figure SE22: Air condition use

As shown in Figure SE23, only 37% often or always disconnect electric appliances when not in use. This means that 63% do not frequently unplug appliances, including 18% that never do. This might offer an acceptable and easy to implement opportunity for many households to save energy and money without loss of comfort.

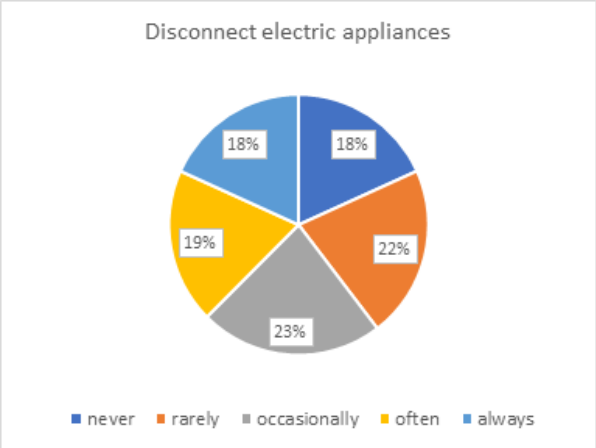


Figure SE23: Disconnect electric appliances

Lastly, when asked whether respondents purchase electricity from a provider with a particularly high share of renewable energy production, 43% answer with Yes and 12% with No (see Figure SE24). This means that 45% do not know whether their electricity provider has a larger share of renewables. A certain share of customers might switch to a provider with a higher share of renewables when they are better informed.

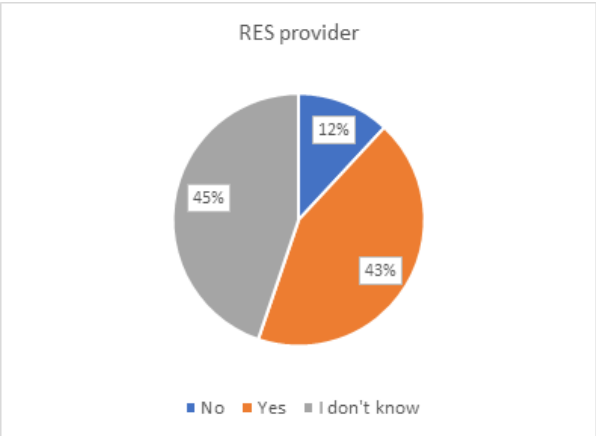


Figure SE24: Purchase electricity from green provider

To sum up, the public transport system is generally well accepted, but might nevertheless offer considerable room for improvement. Other sources of potential savings lie in the fact that many nevertheless mainly drive alone in their car and a considerable but underutilized interest in car-sharing. Bicycle usage seems already relatively good. The relatively rare disconnecting of appliances is a reasonable issue to build upon.

Finally, many respondents are still under-informed about their electricity provider.

4.1.8.5 Interim Conclusion and Suggestions

In terms of age and education, the Swedish sample presents a relatively young and highly educated, even though a substantial share is rather lowly educated, group with more than 70% living in cities. The results indicate a strong acceptance of human made climate change in our lifetime. Energy policies find a relatively strong acceptance and higher costs seem not to be a significant barrier. Renewable energy sources are considered as an influential factor in an environmental sense but slightly less in an economic sense. The majority is aware of the importance of both the individual and especially the group in achieving changes. These attitudes are a solid basis for accepting the need and the meaningful impact of changes in human actions. However, this reasoning is supported only in a limited way by an actual interest of 34% of the respondents in a real investment in renewable energy.

The public transport system is in general well accepted and most respondents are rather convinced of its environmental benefits. As a result, public transport is relatively well utilized, but nevertheless offers room for improvement. An uptake of public transport utilization could decrease kilometres driven by car as a driver substantially. Similarly, this could be achieved by a change in individuals' habits of driving alone. In a similar vein, there is a moderate potential in car-sharing, which, depending on the implementation, could also result in less kilometres driven, less cars, environmentally friendlier cars, etc. Increasing bicycle usage for work and shopping travels would not only decrease motorized driven kilometres and traffic, but also positively affect health and well-being. However, bicycle usage is already relatively good. Individuals might connect these changes in habits with unreasonable loss of comfort. The issue of disconnecting appliances concerns approximately 63% of respondents and is an energy and cost saving change that comes with no loss of comfort. Finally, 45% of respondents do not know if their electricity provider has a particularly large share of renewable energy sources. This lack of information might prevent individuals from purchasing their electricity from a greener provider.

Based on this assessment, the main policy conclusion is to incentivize citizens to shift from private car users to a more collective transport behaviour with increasing usage of public transportation and possibly car sharing services.

4.1.9 Turkey with a focus on Izmir

4.1.9.1 Demographics

This report presents an assessment of the ECHOES survey database for 594 respondents from Turkey and 55 respondents from Izmir.

The respondents from Turkey and Izmir have an almost even distribution of genders, with 51.5% males and 48.5% females. The age distribution is in favour of the younger population where 37.2% of the respondents are aged between 18 and 34 years, and 35.2% are aged between 35 and 44 years. The share of the respondents between 45 and 54 years of age is 22.2%, and the remaining 5.4% are 55 years or older. For Izmir, the respondents have a higher average age, with 38.2% between 50 and 65 years of age, and 7.3% are 65 years or older (see Figures TR1 and TR2).

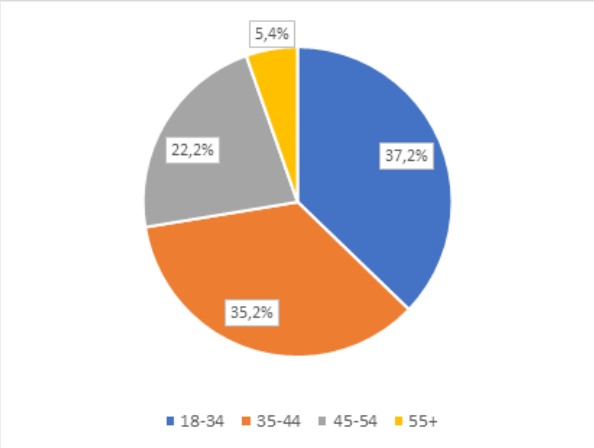


Figure TR1: Respondents by age (Turkey)

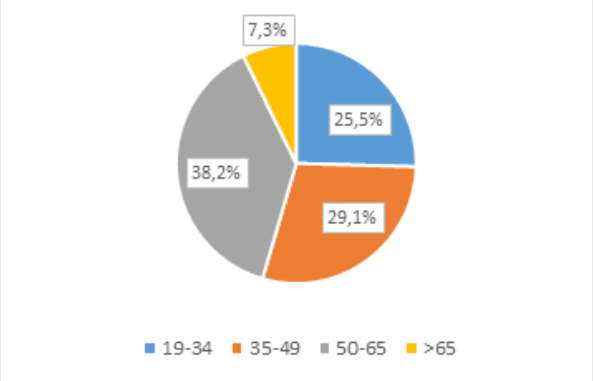


Figure TR2: Respondents by age (Izmir)

Regarding education levels, 74.5% of the respondents from Turkey have tertiary degree education, 9.8% have A-levels and 6.9% have professional education. Figure TR3 depicts education levels of respondents from Turkey. For Izmir, the education level attainments are lower. 65.5% of the respondents from Izmir have tertiary degree education, 14.5% have A-levels and 9.1% have professional education (see Figure TR4).

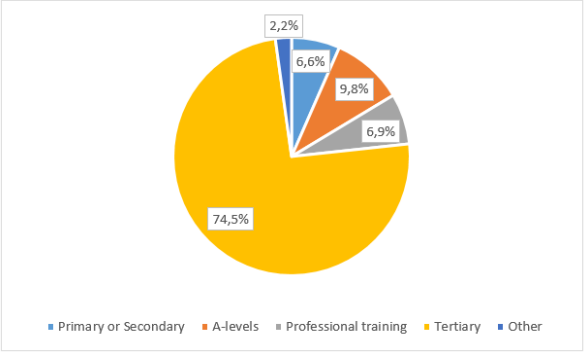


Figure TR3: Respondents by education level (Turkey)

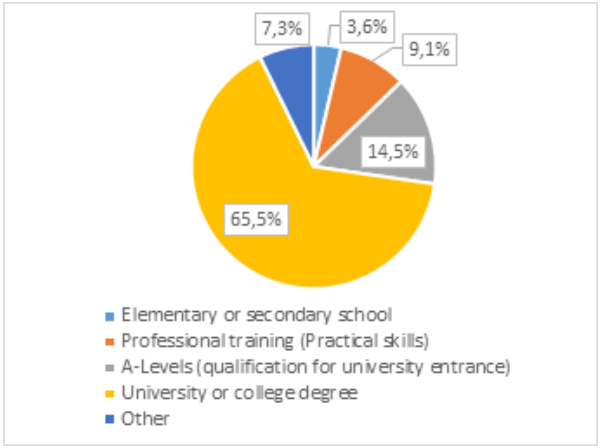


Figure TR4: Respondents by education level (Izmir)

Concerning employment levels, 64.3% of the respondents from Turkey are paid employed, where 6.2% work less than 30 hours in a week. 9.8% are self-employed, 8.9% are retired, and 5.9% are students. Figure TR5 demonstrates the employment status of respondents from Turkey. The employment rate in Izmir is lower as compared to Turkey, owing to the higher ages of the respondents (see Figure TR6). Accordingly, 45.5% of the respondents from Izmir are paid employed, where 5.5% work less than 30 hours in a week. 10.9% are self-employed, 16.4% are retired, and 7.3% are students.

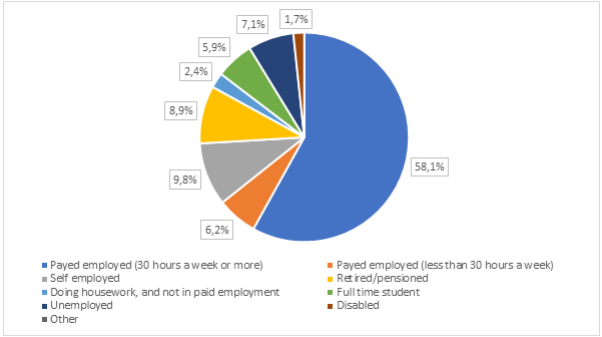


Figure TR5: Employment Status of Respondents (Turkey)

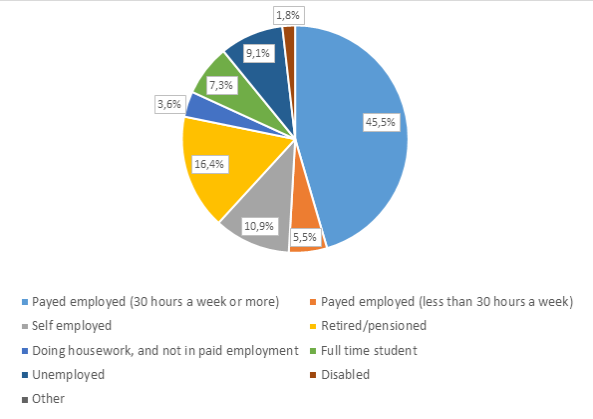


Figure TR6: Employment Status of Respondents (Izmir)

4.1.9.2 Assessment of climate change-related results with respect to themes and subthemes

Concerning the perceptions on global temperature rise, a 70.2% majority of the respondents definitely agree with the statement that the world's temperature has been rising gradually over the past 100 years, and 25.5% think that this statement might be true. 3.4% have no certain idea, whereas 0.9% believe that this statement is not true or probably not true. In Izmir, a lower 60% of the respondents believe that the world's temperature is rising (see Figures TR7 and TR8).

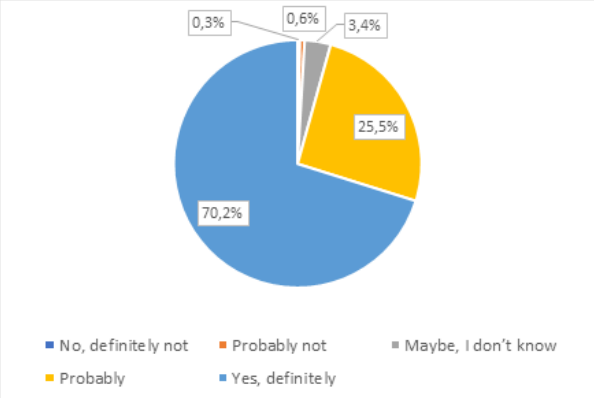


Figure TR7: Climate change (Turkey)

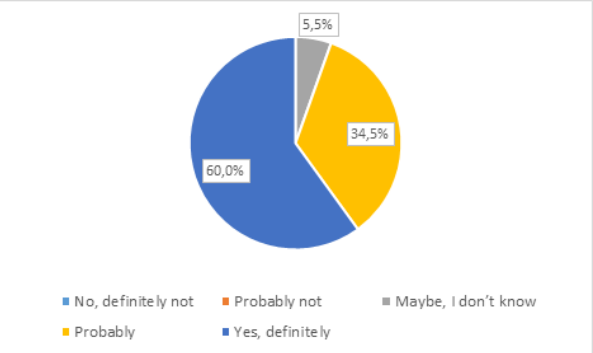


Figure TR8: Climate change (Izmir)

Assuming that the world's temperature is rising, 75.7% of the respondents from Turkey believe that this is caused mainly by human activity, and 18.8% believe that this is a result about equally by natural causes and human activity. The remaining 5.5% believe that temperature rise is mainly by natural causes. For Izmir, a much higher 85.5% of the respondents associate the temperature rise with human activities. (see Figures TR9 and TR10).

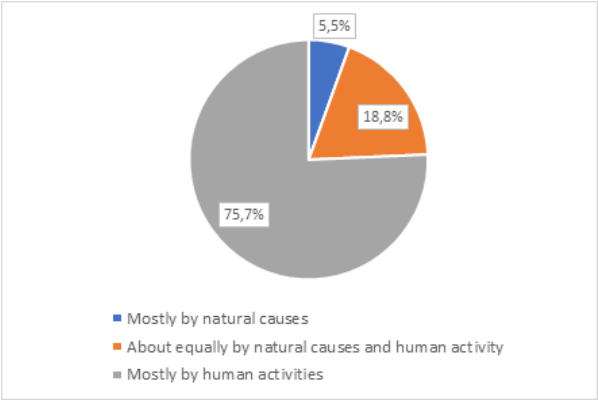


Figure TR9: Cause of climate change (Turkey)

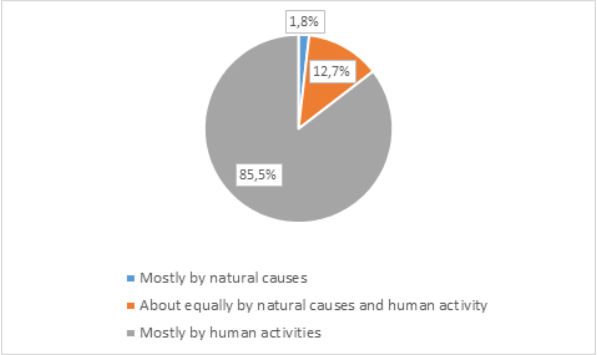


Figure TR10: Cause of climate change (Izmir)

As an indicator regarding providing finances for climate change mitigation/adaptation, when

asked about whether they would like to donate some of their compensation to myclimate.org, 84.5% of the respondents stated that they would not want to donate, and the remaining 15.5% of the respondents agreed to donate varying amounts of 1 Euro (9.1% of the respondents) to 5 Euros (1.7% of the respondents). This rate is higher in Izmir, at 20%.

4.1.9.3 Assessment of energy behaviour/attitude related results with respect to themes and subthemes

Two questions in the ECHOES survey provide reflections of individuals' perceptions, based on the energy savings behaviours of other people. When asked about whether they would feel proud if people saved energy, 50% state that they strongly agree and 25.6% state that they moderately agree. Hence, a high 75.6% of the respondents from Turkey would positively internalize the energy savings behaviours of others. For Izmir, these figures are higher, at a total of 85.4%. (see Figures TR 11 and TR12).

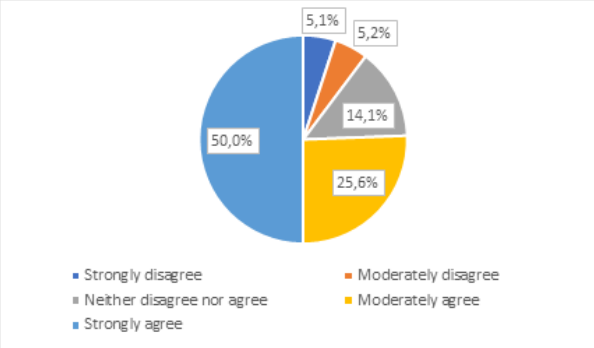


Figure TR11: Feel proud if other people save energy (Turkey)

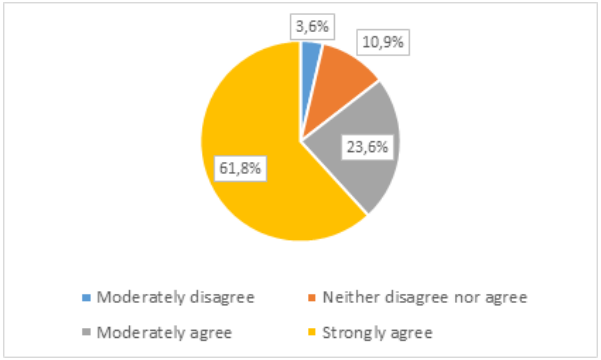


Figure TR12: Feel proud if other people save energy (Izmir)

On the other hand, when asked about whether they are angry that people do not save energy, 43.3% state that they strongly agree and 25.8% state that they moderately agree. In this case, a still high 69% of the respondents negatively internalize the negative behaviours (not saving energy) of others. In both cases, around 13.5-14% of the respondents neither agree nor disagree with the statements. For the case with energy savings behaviours of others, 10.3% of the respondents either moderately or strongly disagree that they would feel proud, whereas for the case with non-energy savings behaviours of others, 17.6% either moderately or strongly disagree that they feel angry. These results are summarized in Figure TR13.

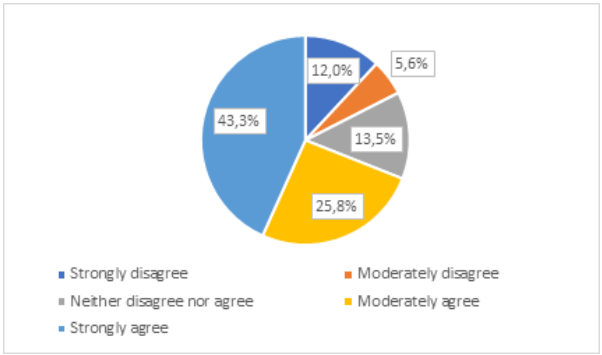


Figure TR13: Angry about the fact that many people do not save energy (Turkey)

Similar to above results, the share of respondents from Izmir who state they are angry that people do not save energy is at 80%, around 10% higher than the country average (see Figure TR14).

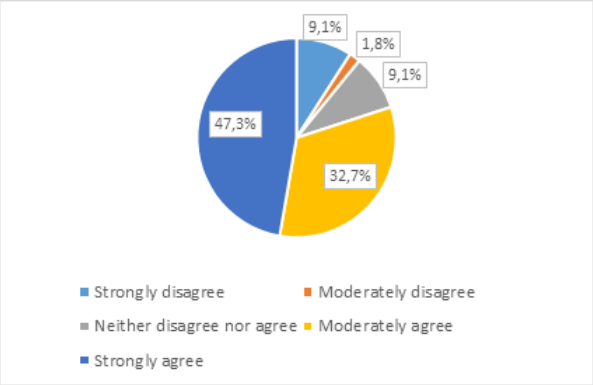


Figure TR14: Angry about the fact that many people do not save energy (Izmir)

Another question relates to the perceptions of individuals regarding how the energy savings behaviours of others are evolving. In this context, when asked whether an increasing number of people try to save energy (e.g., using public transport instead of a personal car, turning off lights when leaving the room, using technical appliances which help to save energy), 22.6% of the respondents from Turkey strongly agree, and 32.7% moderately agree. On the other hand, 10.1% of the respondents strongly disagree, and 12.6% of the respondents moderately disagree. A relatively high 22.1% of the respondents neither agree nor disagree. These results show that 55% of the respondents from Turkey are optimistic about the energy savings behaviours of others, 22% are pessimistic, and the remaining 22% is yet undecided. For the case of Izmir, a higher level of optimism is observed. 70.9% of the respondents from Izmir are optimistic about the energy savings behaviours of others, 12.8% are pessimistic, and the remaining 16.4% is yet undecided (see Figures TR15 and TR16).

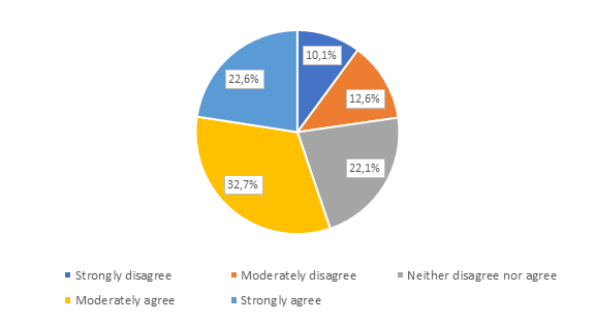


Figure TR15: Respondents' Perceptions on whether an increasing number of people try to save energy (Turkey)

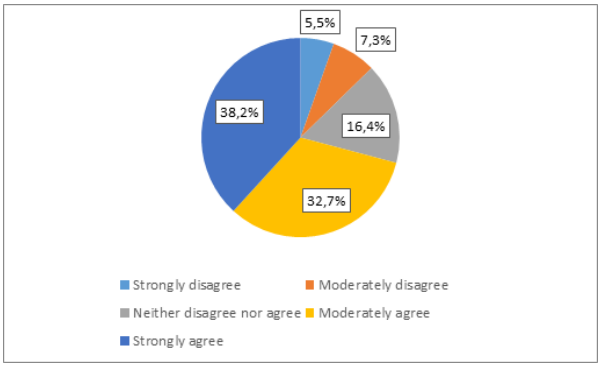


Figure TR16: Respondents' perceptions on whether an increasing number of people try to save energy (Izmir)

With regard to the individuals' self-assessment on their energy behaviours, one survey question pertains to how the respondents perceive their own energy use in connection with the transition to a renewable energy system. 36.4% of the respondents from Turkey strongly agree with this statement, and 44.9% moderately agree, totalling 81.3% who believe that their energy use behaviours are in line with energy transition. Only 2.3% of the respondents either strongly or moderately disagree with this statement, and 16.3% neither agree nor disagree. For the case of Izmir, the share of respondents who perceive their own energy use in connection with the transition to a renewable energy system is at a much higher 92.7% (see Figures TR17 and TR18).

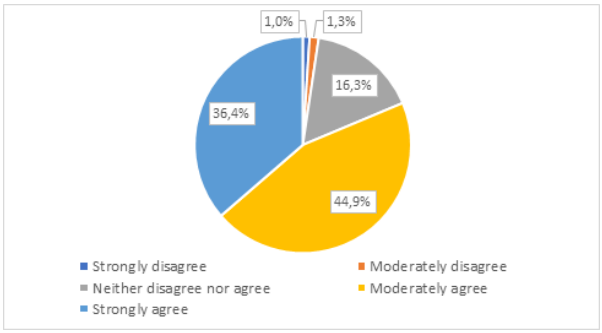


Figure TR17: Self-assessment on the intention to use energy in a way that helps bringing the transition to a renewable energy system (Turkey)

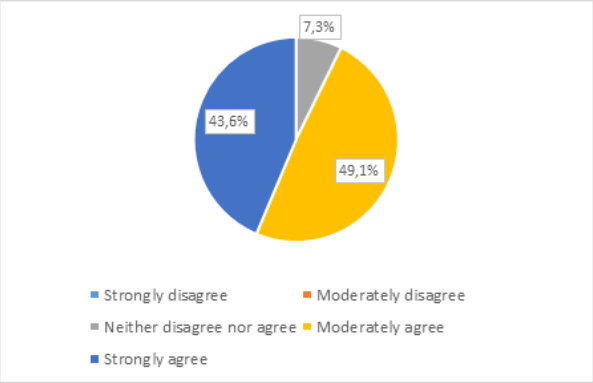


Figure TR18: Self-assessment on the intention to use energy in a way that helps bringing the transition to a renewable energy system (Izmir)

These results point to a much higher acceptance of individuals' own energy behaviours as compared to others' energy behaviours.

Another subtheme of energy behaviour pertains to renewable energy. In this context, there is an 88% consensus between respondents from Turkey that the use of more renewable energy sources will benefit the environment. 5.4% of the respondents do not agree with the conjecture, and the remaining 6.7% neither agree nor disagree. For Izmir, similar to above results, higher rates are observed as compared to Turkey. 94.5% of the respondents from Izmir agree the use of more renewable energy sources will benefit the environment, 1.8% of the respondents do not agree, and the remaining 3.6% neither agree nor disagree (see Figures TR19 and TR20).

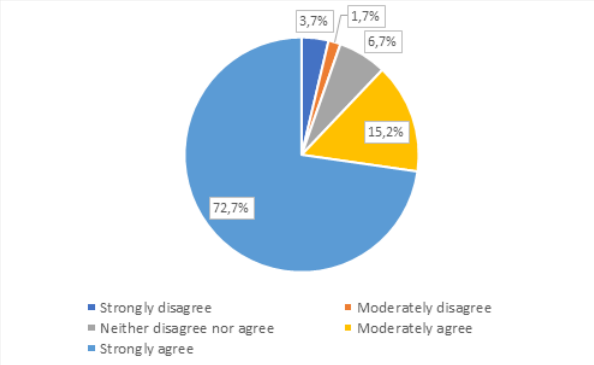


Figure TR19: Renewable energy sources benefit the environment (Turkey)

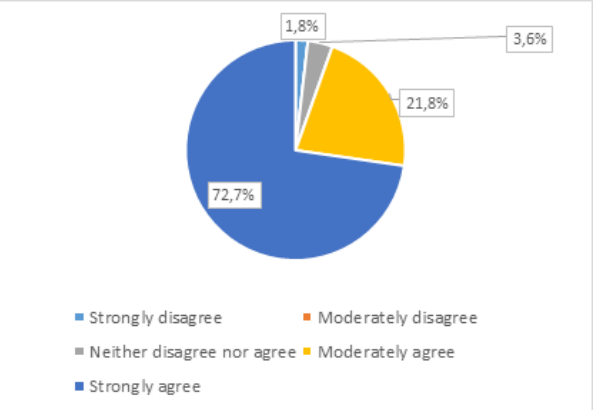


Figure TR20: Renewable energy sources benefit the environment (Izmir)

When a more socio-economic aspect, the effect of renewable energy on creating new jobs, is considered, a slightly smaller 83% strongly or moderately agree that renewable energy creates new jobs, and a higher 11% neither agree nor disagree. 6% of the respondents either strongly or moderately disagree that renewable energy creates new jobs. These results are presented in Figure TR21 below.

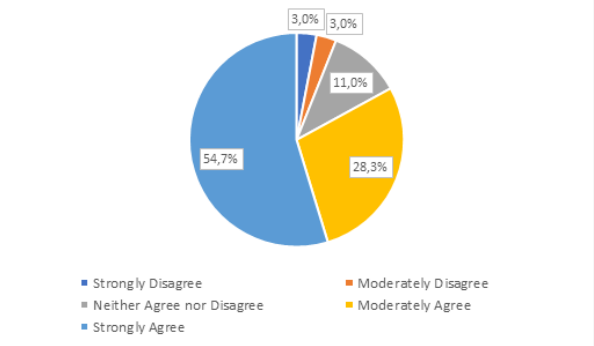


Figure TR21: Renewable energy sources create new jobs (Turkey)

For Izmir, again a higher 89.1% strongly or moderately agree that renewable energy creates new jobs, and a higher 9.1% neither agree nor disagree. 1.8% either strongly or moderately disagree that renewable energy creates new jobs (see Figure TR22).

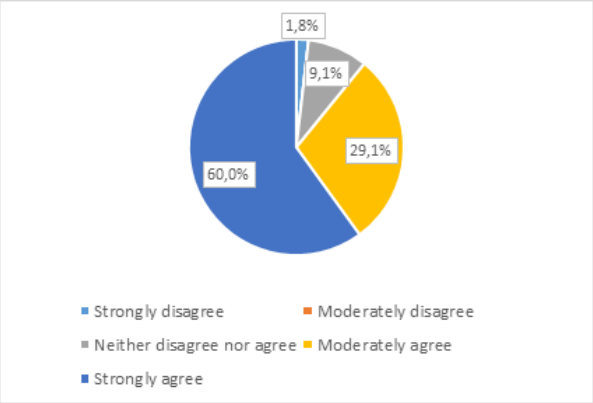


Figure TR22: Renewable energy sources create new jobs (Izmir)

Energy policies have significant effects on the energy behaviours of individuals. The attitudes towards energy policies provide valuable information concerning energy behaviours. Starting from how the individuals perceive their communities' attitudes towards energy policies, slightly more than half of the respondents (54.8%) either strongly or moderately agree that there is increasing community support for energy policies that drive the energy transition. On the other hand, 20.9% either strongly or moderately disagree. A higher 24.2% of the respondents neither agree nor disagree. Therefore, it can be concluded that respondents from Turkey do not perceive a strong community support for pro-energy transition policies. This is demonstrated in Figure TR23 below. The results for Izmir demonstrate a higher share who either strongly or moderately agree that there is increasing community support for energy policies that drive the energy transition support, at 63.6% (see Figure TR24).

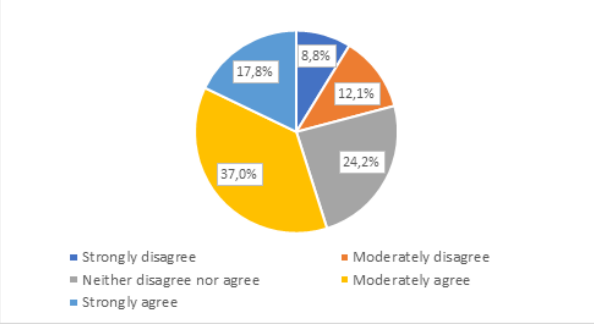


Figure TR23: Perceptions on whether number of people who favour energy policies that support the energy transition is increasing (Turkey)

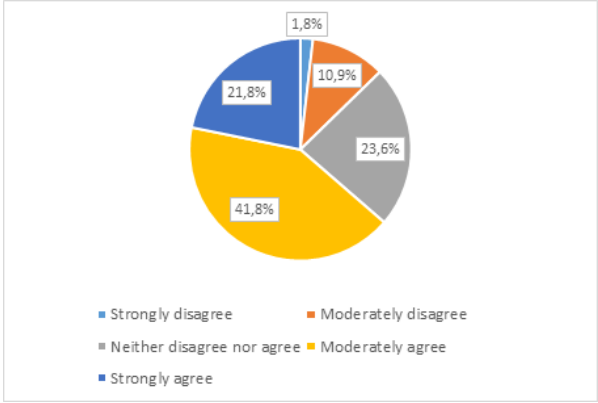


Figure TR24: Perceptions on whether number of people who favour energy policies that support the energy transition is increasing (Izmir)

A related perspective is provided through what level of support individuals expect from their communities if they favoured pro-energy transition policies. In this case, less than half of the respondents from Turkey (49.2%) expect that many people would support it if they favoured energy policies that support the energy transition. 25.4% of the respondents either strongly or moderately believe that they will not receive such support, and a similar 25.4% neither agree nor disagree with this statement. This points to a strong challenge for individuals in terms of their support for energy policies, thus, may have significant reflections on energy behaviours. For Izmir, the share of respondents who expect that many people from their communities if they favoured pro-energy transition policies is much higher, at 61.9% (see Figures TR25 and TR26).

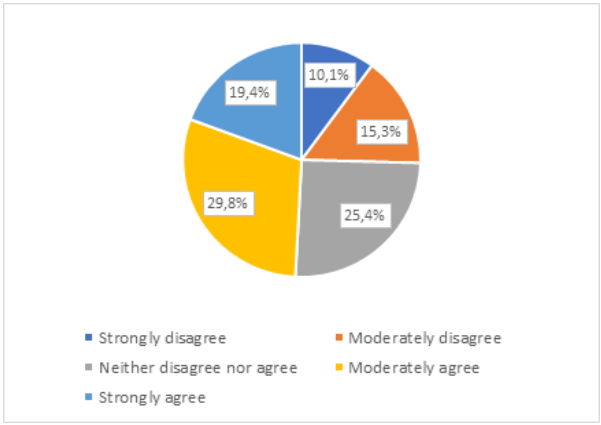


Figure TR25: Expected community support for favouring pro-energy transition policies (Turkey)

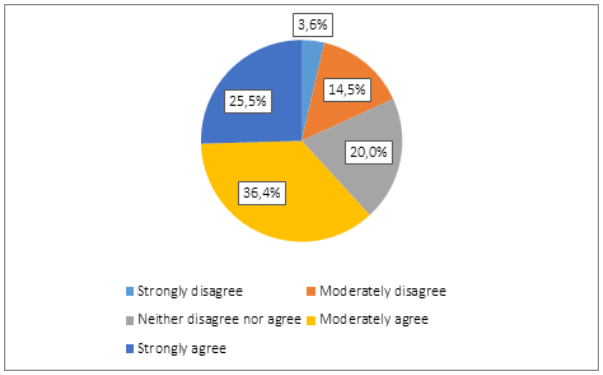


Figure TR26: Expected community support for favouring pro-energy transition policies (Izmir)

The interaction between the individual and the community is two-way. The individuals are affected by the behaviours and lifestyle choices of other individuals in their communities. Among the respondents in Turkey, 76.7% strongly or moderately agree that they behave more environmentally friendly if most of the other people around them do. 13.1% neither agree nor disagree, and only 10.1% of the respondents disagree with this statement. Hence, the interaction between the individual and the community/society can be utilized as a lever for lifestyle choices. These results are shown in Figure 4.145 below. For the case of Izmir, a stronger interaction is observed. 81.8% strongly or moderately agree that they behave in a more environmentally friendly way if most other people do. 5.5% neither agree nor disagree, and only 5.5% of the respondents disagree (see Figures TR27 and TR28).

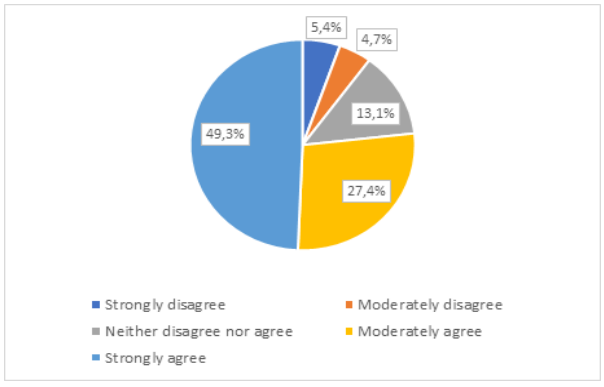


Figure TR27: Expected individuals support for favouring pro-energy transition policies (Turkey)

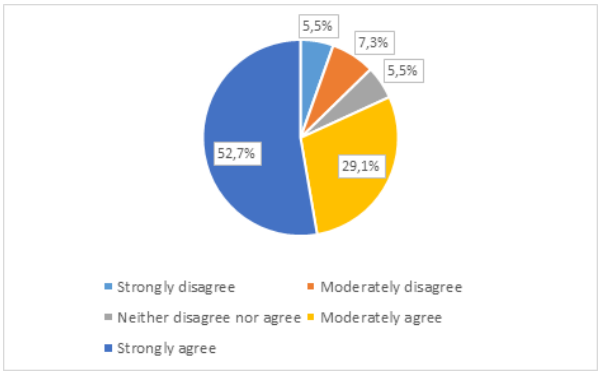


Figure TR28: Expected individuals support for favouring pro-energy transition policies (Izmir)

Given the community viewpoint, the individuals demonstrate attitudes towards energy policies in different ways. To begin with, an overall conclusion can be drawn from how much individuals feel personally obliged to support energy policies that support the energy transition. 40.1% of the respondents from Turkey strongly agree that they have this feeling, and 34.7% moderately agree. Only 7.3% either strongly or moderately disagree. Yet, a significant 18% neither agree nor disagree. Recalling the rather low perceptions concerning community support, individuals' support for energy policies is rather promising. The same trend is observed in Izmir, although with higher rates. 47.3% of the respondents from Izmir strongly agree that they have this feeling of personal obligation to support energy policies that support the energy transition, whereas 41.8% state that they moderately agree. The remaining 10.9% neither agree nor disagree (see Figures TR29 and TR30).

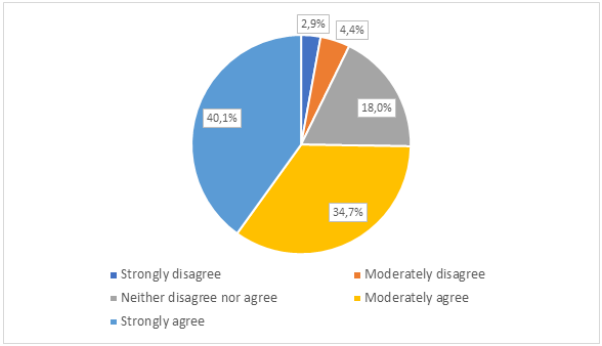


Figure TR29: Personal obligation to support pro-energy transition policies (Turkey)

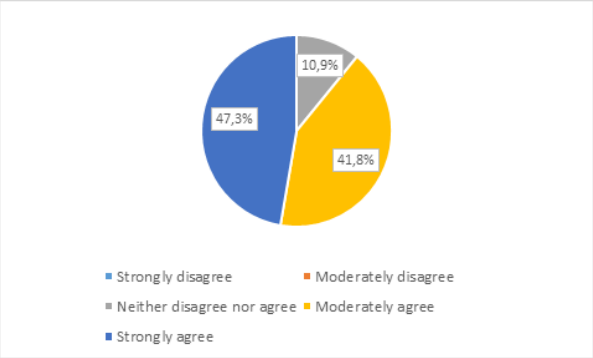


Figure TR30: Personal obligation to support pro-energy transition policies (Izmir)

Other pointers to the relationship between the individuals and energy policies are provided by the respondents' approach to policies that induce higher costs. In the first case where energy policies that protect the environment, but also induce higher costs are considered, 34% of the respondents strongly agree that they would accept such policies, and 33.2% of the respondents moderately agree that they would accept policies that protect the environment even when these induce higher costs (e.g., policies that increase the prices of fossil fuels). Against a total of 67.2% of the respondents who agree that they would accept pro-environmental policies that induce higher costs, 11.6% of the respondents disagree that they would accept such policies, and 21.2% neither agree nor disagree. For the case of Izmir, the share of respondents who agree that they would accept pro-environmental policies that induce higher costs is 83.6% (see Figures TR31 and TR32).

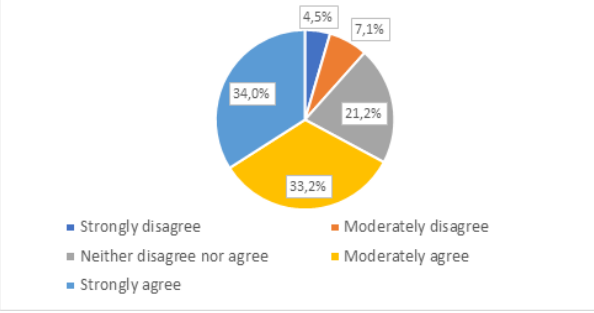


Figure TR31: Policies that protect the environment (Turkey)

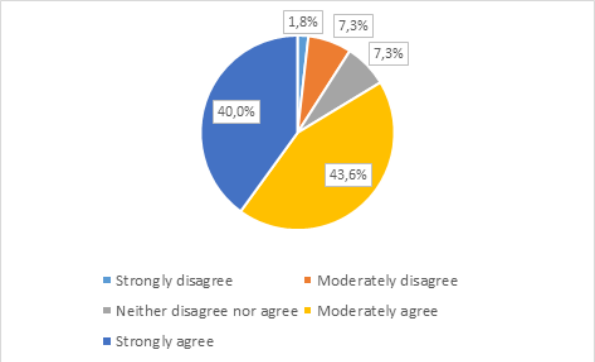


Figure TR32: Policies that protect the environment (Izmir)

When it comes to energy policies that create new jobs, but also induce higher costs (e.g., policies that increase the prices of fossil fuels), a very similar 67.3% either strongly or moderately agree that they would accept such policies. A slightly higher 13.3% either strongly or moderately disagree that they would accept such policies, and a slightly lower 19.4% neither agree nor disagree. For Izmir, the share of respondents who state that they would support energy policies that create new jobs, but also induce higher costs, is 83.6% (see Figures TR33 and TR34).

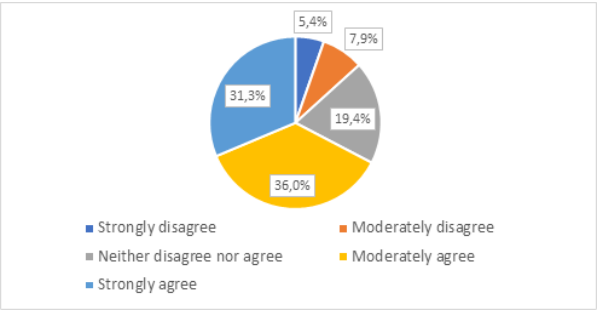


Figure TR33: Policies that create new jobs (Turkey)

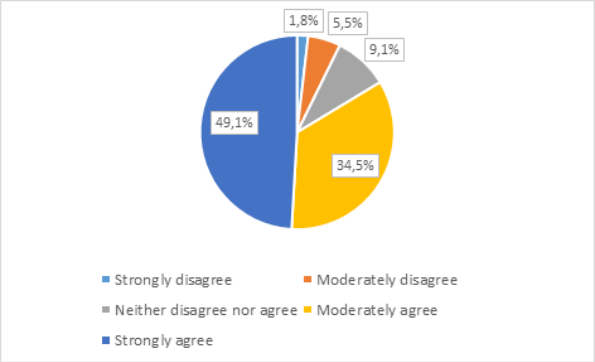


Figure TR34: Policies that create new jobs (Izmir)

As expected, the support for energy policies diminishes, as concerns regarding possible additional costs are reminded. For the respondents from Turkey, the average effect of this concern corresponds to an around 10% decrease in policy support, from the level of 77% to 67%, bringing in an important factor that needs to be considered in the context of energy policy making.

4.1.9.4 Assessment of lifestyle-related results with respect to themes, subthemes, and focal areas

One main component of lifestyle choices is related to energy savings and energy efficiency. At this point, the choices and perceptions of the community or society plays an important role in the choices of individuals. When asked about how the respondents perceive the trends in the community in terms of decreasing their energy consumption for heating and cooling their dwelling, only around 50% of the respondents strongly or moderately agree that they believe an increasing number of people do so. 26.4% of the respondents neither agree nor disagree with this statement, and the remaining 23.7% strongly or moderately disagree that a growing number of people have decreased their energy consumption for heating and cooling their dwelling. This points to a low trust regarding individuals' perspectives on the trend of daily lifestyle choices of the community. For the case of Izmir, the results demonstrate an even lower level of trust, with 44% of the respondents strongly or moderately agreeing that an increasing number of people decrease their energy consumption for heating and cooling their dwelling (see Figures TR36 and TR36).

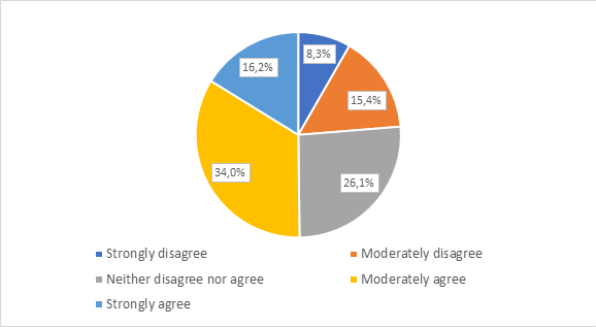


Figure TR35: Perceptions of the respondents in terms of the trend in community regarding decreased energy consumption for heating and cooling in the dwellings (Turkey)

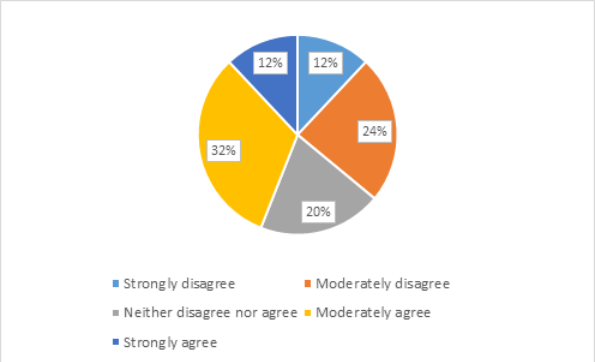


Figure TR36: Perceptions of the respondents in terms of the trend in community regarding decreased energy consumption for heating and cooling in the dwellings (Izmir)

The effects of the community trend may be observed through the individuals' expected community support for decreasing their perception on how the community would react to their energy consumption for heating and cooling in their dwellings. In this case, a higher 62% of the respondents from Turkey expect support from their communities. On the other hand, 20.9% of the respondents neither agree nor disagree that they would receive support from many people for decreasing their energy consumption for heating and cooling their dwellings. Finally, 17% of the respondents either strongly or moderately disagree that they would receive such support from their communities. Similar with the earlier result for community support, as compared to Turkey, a lower share, 56%, of respondents from Izmir believe that they would receive support from many people for decreasing their energy

consumption for heating and cooling their dwellings (see Figures TR37 and TR38).

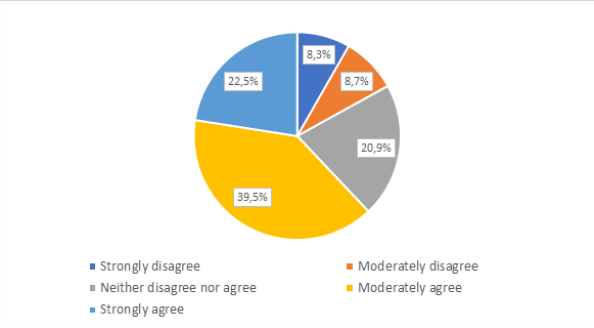


Figure TR37: Expected support from the community for decreasing energy consumption for heating and cooling in the dwellings (Turkey)

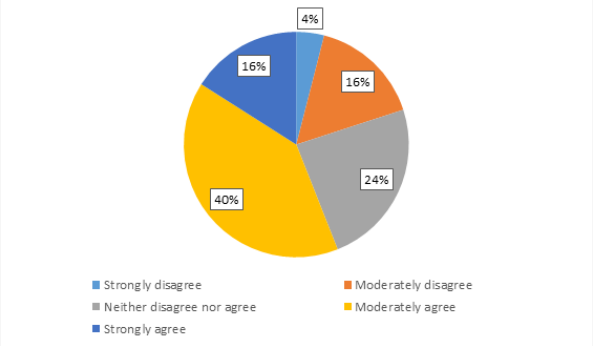


Figure TR38: Expected support from the community for decreasing energy consumption for heating and cooling in the dwellings (Izmir)

The debate on the individuals' perspective on the community, and the community's view on the individual lifestyle choices also raises concerns regarding the role of the individual alone and with the community regarding energy-related lifestyle choices. At this point, two related survey questions provide valuable insights. Concerning their perception on whether respondents as individuals can do much to support the energy transition, 30.8% of the respondents strongly agree, and 43.5% of the respondents moderately agree, totalling a 74.3% who agree on their potential as individuals for contributing to energy transition. In this case, 16.3% of the respondents neither agree nor disagree with their roles as individuals in the energy transition, and 23.2% either strongly or moderately disagree that individuals can do much to support the energy transition. For the case of Izmir 85.4% believe that as individuals, they can do much to support the energy transition (see Figures TR39 and TR40).

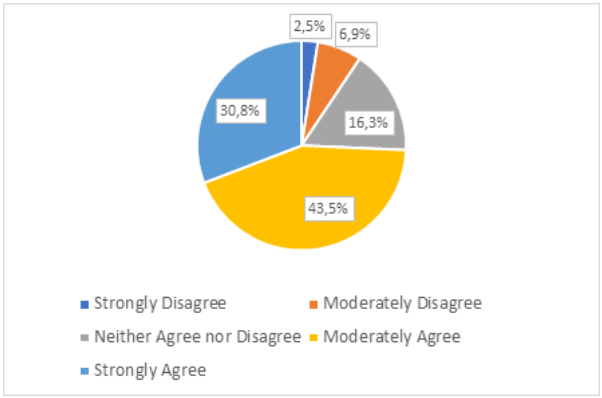


Figure TR39: I can do a lot to support the energy transition (Turkey)

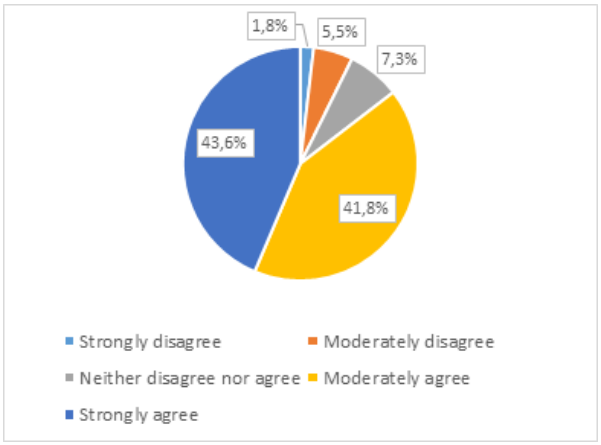


Figure TR40: I can do a lot to support the energy transition (Izmir)

On the other hand, when the question is modified to query the perceptions of the respondents for collaborative contributions to energy transition, a much lower 7.9% strongly agree that people can act together to achieve energy transition, and 29% moderately agree with this statement, summing to a 36.9% who agree. 28.6% of the respondents neither agree nor disagree, and 24.5% either strongly or moderately disagree. These results are demonstrated in Figure 4.151 below. For the case of Izmir, 5.5% strongly agree that people can act together to achieve energy transition, and 38.2% moderately agree with this statement, summing to a 43.7% who agree. 18.2% of the respondents neither agree nor disagree, and 38.2% either strongly or moderately disagree (see Figures TR41 and TR42).

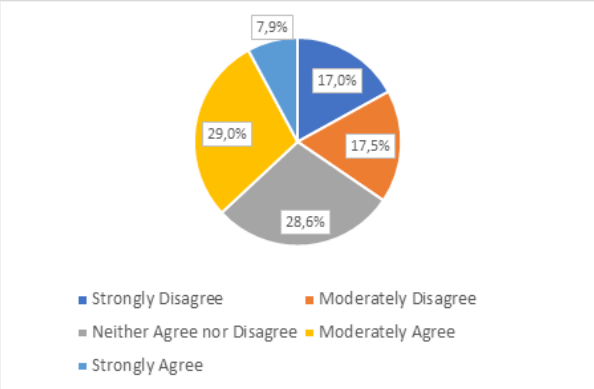


Figure TR41: We as people can act together to achieve the energy transition (Turkey)

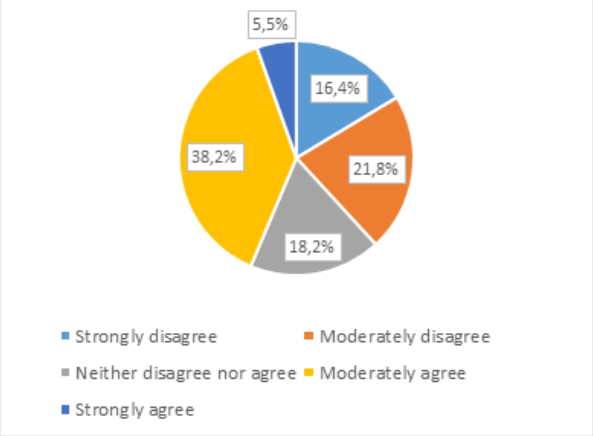


Figure TR42: We as people can act together to achieve the energy transition (Izmir)

The comparison for the perceptions on individual versus community contribution potentials is striking, with much lower positive expectations, and much higher undecided respondents when joint contributions are considered.

Concentrating on the lifestyle choices of individuals in terms of energy savings and energy efficiency, the majority of the respondents from Turkey (83.2%) either strongly or moderately agree that they feel a personal obligation to be energy efficient (e.g., using public transport instead of a personal car, turning off lights when leaving the room, using technical appliances which help to save energy). Only 5.9% of the respondents either strongly or moderately disagree with this statement, and 10.9% neither agree nor disagree. For the case of Izmir, a much higher 94.5% either strongly or moderately agree that they feel a personal obligation to be energy efficient (see Figures TR43 and TR44).

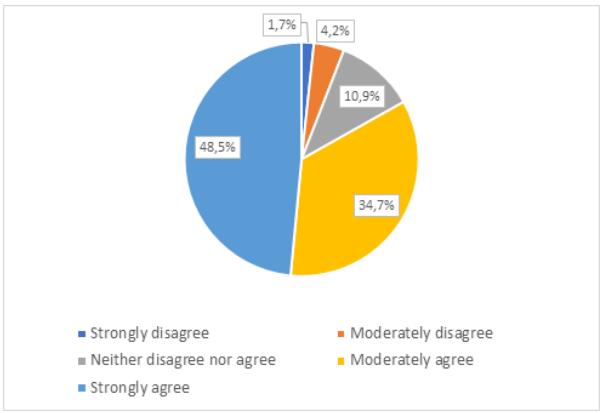


Figure TR43: Personal obligation to be energy efficient (Turkey)

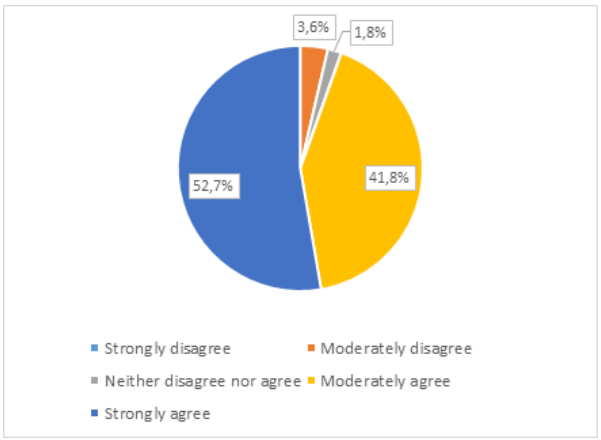


Figure TR44: Personal obligation to be energy efficient (Izmir)

A related example would concern energy savings by decreasing the energy consumption for heating and cooling in the dwellings. At this point, 80.2% of the respondents either strongly or moderately agree that they feel a personal obligation to decrease their energy consumption. On the other hand, 6.3% either strongly or moderately disagree with this statement, and 13.4% neither agree nor disagree. When the respondents refer to intentions rather than feeling obliged, a slightly higher 83.4% (as compared to the share of respondents who feel obliged) strongly or moderately agree that they intend to decrease their energy consumption for heating and cooling their dwellings. A similar 12.3% neither agree nor disagree, and a smaller 4.4% either strongly or moderately disagree that they intend

to decrease their energy consumption for heating and cooling their dwellings. As compared to the sample from Turkey, Izmir demonstrates higher levels of agreement for feeling obliged or intention. 96% of the respondents from Izmir either strongly or moderately agree that they feel a personal obligation to decrease their energy consumption for heating and cooling their dwellings, and 88% strongly or moderately agree that they intend to decrease their energy consumption for heating and cooling their dwellings (see Figures TR45 - TR48).

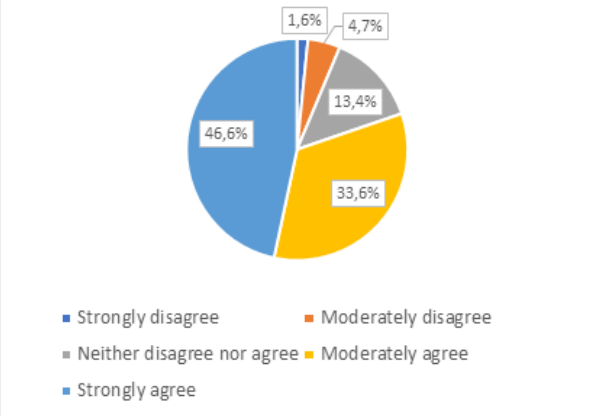


Figure TR45: Feeling of personal obligation (Turkey)

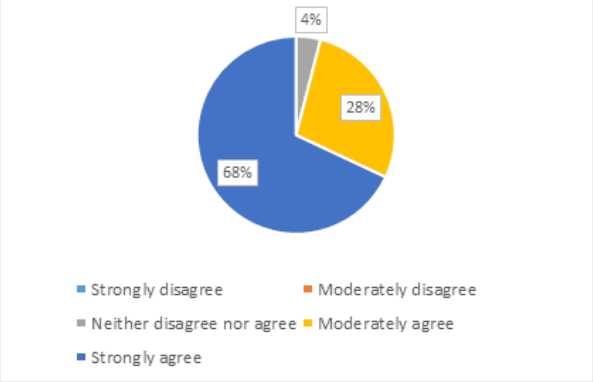


Figure TR46: Feeling of personal obligation (Izmir)

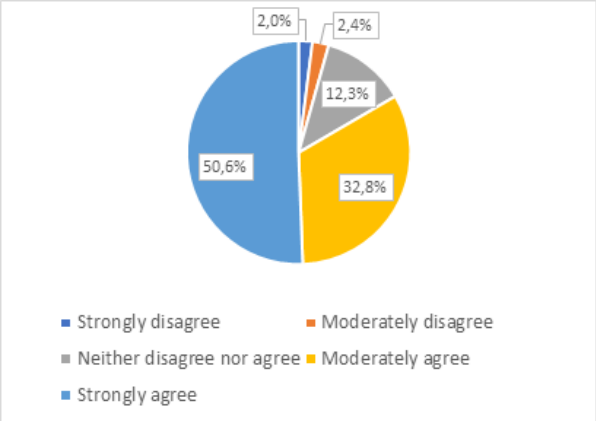


Figure TR47: Intention to decrease energy consumption for heating and cooling in dwellings (Turkey)

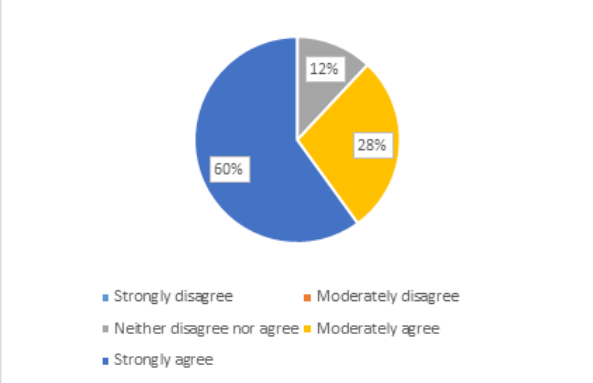


Figure TR48: Intention to decrease energy consumption for heating and cooling in dwellings (Izmir)

Evaluating the energy savings for heating and cooling by a hypothetical rate of 10%, a 79.1% majority of the respondents state that they would be very proud or mainly proud, 14.6% state that they would feel moderately proud, and 5.1% slightly proud. Only 1.2% of the respondents state that they would not feel proud at all. The results for Izmir are similar to that of Turkey (see Figure TR49).

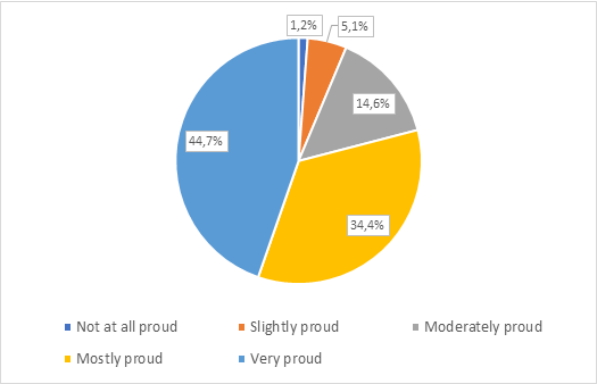


Figure TR49: Feeling if energy consumption for heating and cooling dwelling is decreased by 10% over the next year

Hence, this positive feeling can be exploited for fostering energy savings behaviour and lifestyle changes. Another aspect that can be utilized for lifestyle changes is the belief of contribution to the energy transition. As discussed above, decreasing energy consumption for heating and cooling in dwellings can also be motivated by the feeling of contribution to energy transition. Likewise, purchasing an electric bicycle, or allowing the grid operator to remotely switch on and off non-critical home appliances can be stimulated through their contributions to energy transition.

Regarding energy savings for heating and cooling, 77.9% of the respondents either strongly or moderately agree that this contributes to energy transition. However, for the case with purchasing an electric bicycle, this rate decreases to 75.3%. For allowing the grid operator to remotely switch on and off non-critical home appliances, there is a higher level of scepticism, reflected by a decrease to 58.7% in the rate of respondents who agree on the contribution of this activity to energy transition. For all three examples around 10-12% of the respondents disagree regarding the contribution to energy transition. For the case of allowing the grid operator to remotely switch on and off non-critical home appliances, a considerable 29.3% of the respondents neither agree nor disagree with the contribution to energy transition. For the case of Izmir, a much higher 96% of the respondents either strongly or moderately agree that energy savings for heating and cooling contributes to energy transition. For the case of purchasing an electric bicycle, this rate decreases to 66.7%, even lower than that of the Turkey sample. When it comes to allowing the grid operator to remotely switch on and off non-critical home appliances, 77.8% in the rate of respondents agree on the contribution of this activity to energy transition (see Figures TR50-TR53)

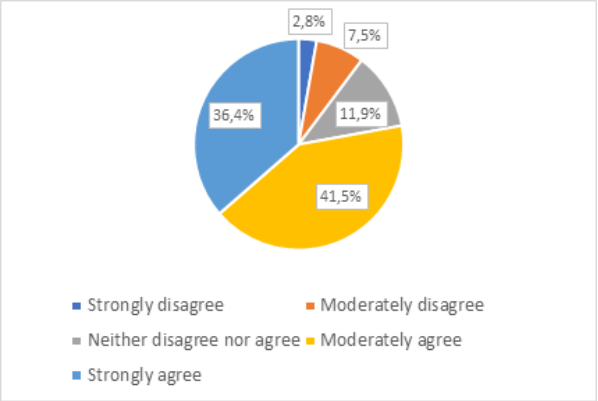


Figure TR50: Reducing consumption for heating and cooling (Turkey)

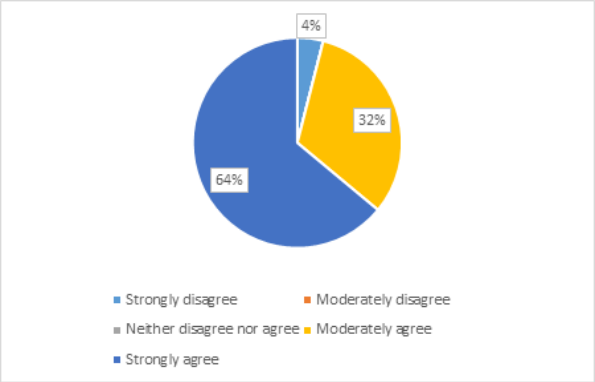


Figure TR51: Reducing consumption for heating and cooling (Izmir)

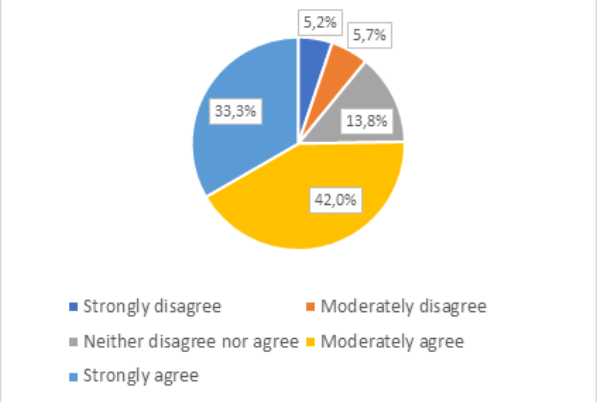


Figure TR52: Purchasing an electric bicycle (Turkey)

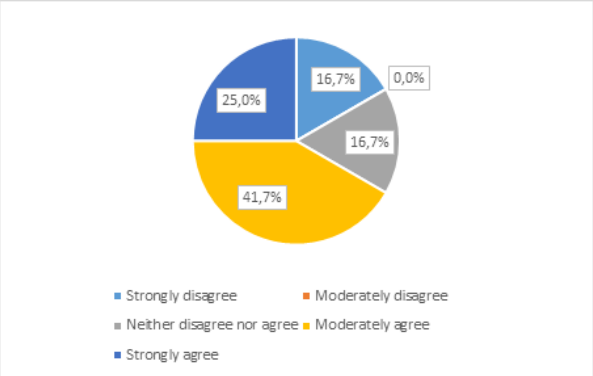


Figure TR53: Purchasing an electric bicycle (Izmir)

The effects of lifestyle choices are demonstrated by the carbon footprints. In this regard, one of the choices to be supported is the use of public transportation. The perceptions of respondents from Turkey regarding public transportation demonstrates interesting results. Only 3.7% of the respondents strongly agree that public transportation is environmentally friendly, 12.3% moderately agree, and 22.5% neither agree nor disagree that public transportation is environmentally friendly. A 61.5% majority of the respondents strongly or moderately disagree that public transportation is environmentally friendly. This result can be associated with the widespread use of fossil fuels for public transportation vehicles, especially buses. This is also reflected in the satisfaction levels of respondents with public transportation. Only 40% of the respondents state that they are satisfied with public transportation, whereas 23.6% are neither satisfied nor dissatisfied and the remaining 36.3% are dissatisfied. Although at higher levels of perceiving public transportation as environmentally friendly and satisfaction with the public transportation, the respondents in Izmir also have negative perceptions for public transportation (see Figures TR54-TR57).

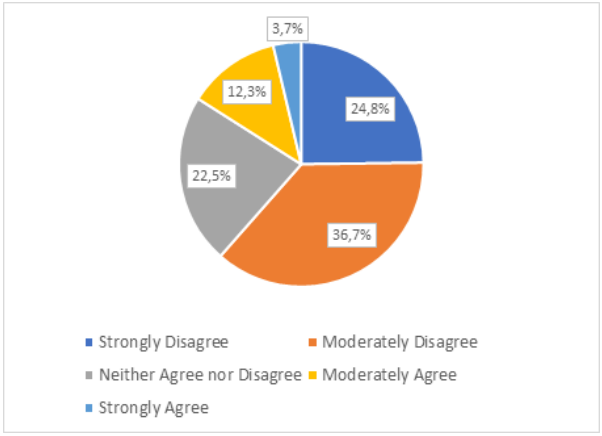


Figure TR54: The public transportation system in my area to be environmentally friendly (Turkey)

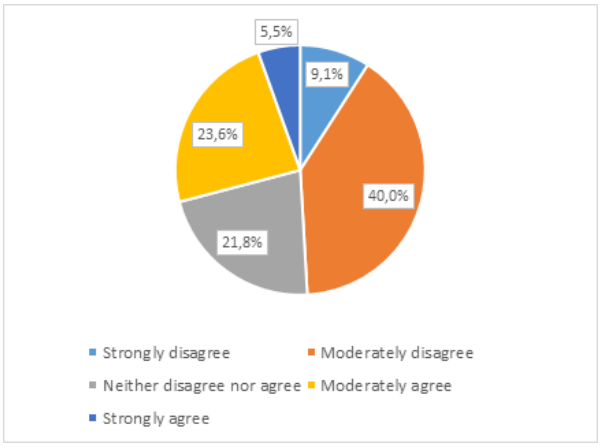


Figure TR55: The public transportation system in my area to be environmentally friendly (Izmir)

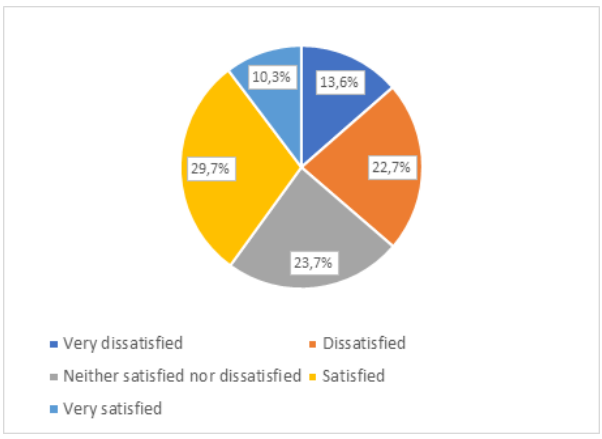


Figure TR56: Satisfaction level of respondents on current public transportation system (Turkey)

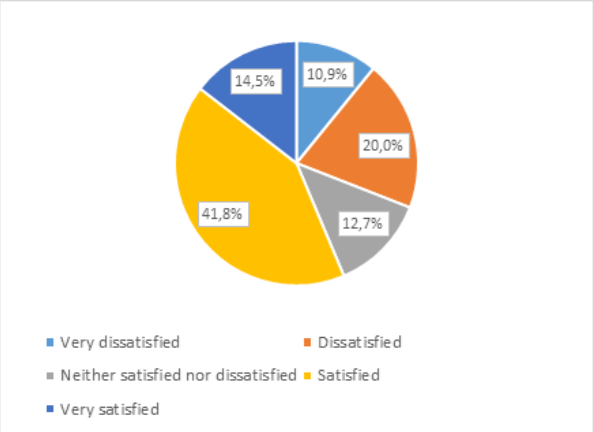


Figure TR57: Satisfaction level of respondents on current public transportation system (Izmir)

Along with these results, the usage frequencies of public transportation also point to the same direction. Only 15.6% of the respondents use public transportation for more than 12 trips per week, 11.3% have between 9 and 12 trips per week, and 17.4% have 5-8 trips per week with public transportation. The usage rates are lower for Izmir. Only 7.3% of the respondents use public transportation for more than 12 trips per week, 7.3%, between 9 and 12 trips. The most used type of public transportation is a bus (71%), followed by underground (47.5%), tram (32.7%), and train (13.3%).

The negative perceptions of the respondents regarding public transportation in Turkey, and the rather low usage rate of public transportation, points to private driving as a common lifestyle choice. A majority of the respondents (66.1%) state that they drive alone in the car more than half of the time. 9.9% state that they almost always drive alone, and 36.6% state that they very often drive alone. Similar evidence can be drawn from the results that 16% of the respondents state that they are usually alone in the car while driving, 33.9% state that there are 2 persons, and 31.2%, 3 persons (see Figures TR58-TR61).

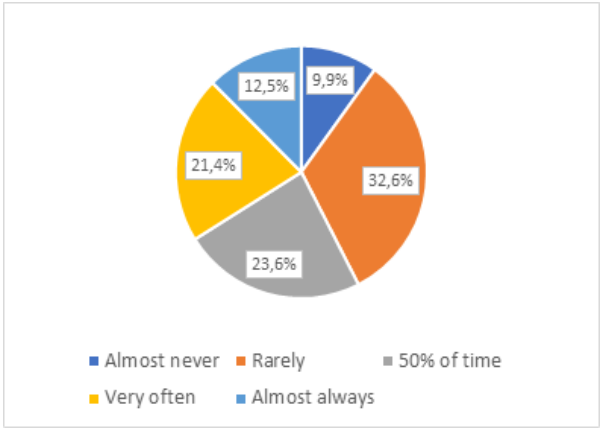


Figure TR58: Driving alone (Turkey)

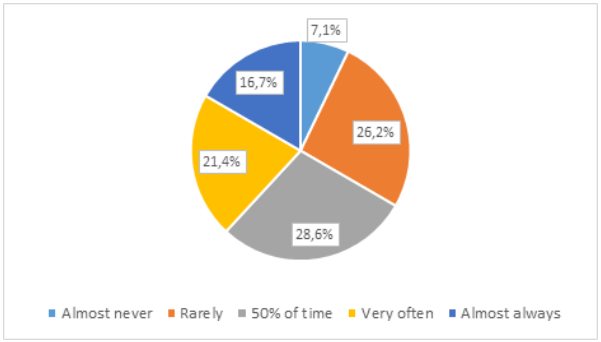


Figure TR59: Driving alone (Izmir)

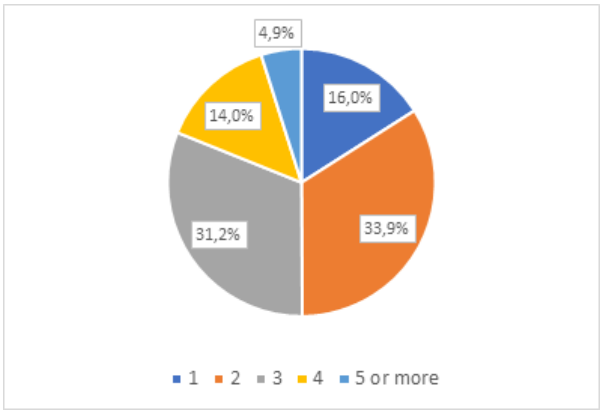


Figure TR60: Usual number of people in the car while the respondent is driving (Turkey)

For Izmir, the results are more promising. 50.0% of the respondents state that there are 2 persons, 19.0% state that there are 3 persons in the car while they are driving.

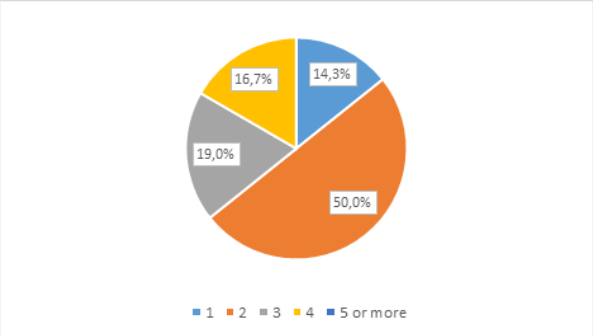


Figure TR61: Usual number of people in the car while the respondent is driving (Izmir)

This lifestyle choice of private driving which is inclined heavily towards driving alone is made usually with vehicles that use fossil fuels. Only 3.9% of the respondents stated that they use electric (fully electric, hybrid-electric, or plug-in hybrid) cars.

When car-sharing is considered, 75% of the respondents state that they have not tried car-sharing. Concerning the potential for car-sharing, 35.9% of the respondents state that they have neither tried nor are interested in car-sharing either. 25% of the respondents have tried car-sharing, where most of them are happy with their experiences. Only 1.3 % of the respondents have tried car-sharing and not liked it.

Another type of private transportation which is an important representative of lifestyle choices is the use of bicycles. When asked about their bicycle use for work and shopping, 64.6% of the respondents from Turkey state that they almost never use bicycles for work and shopping. Another 15.8% rarely use, and 9.6% of the respondents sometimes use bicycles for work and shopping. Only 2.2% of the respondents state that they usually use bicycles for work and shopping all year. The rates of bicycle usage are lower for Izmir. 78.2% of the respondents from Izmir state that they almost never use bicycles for work and shopping (see Figures TR62 and TR63)

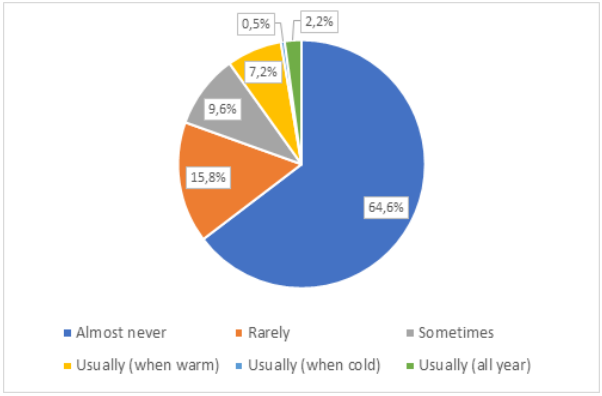


Figure TR62: Bicycle use (Turkey)

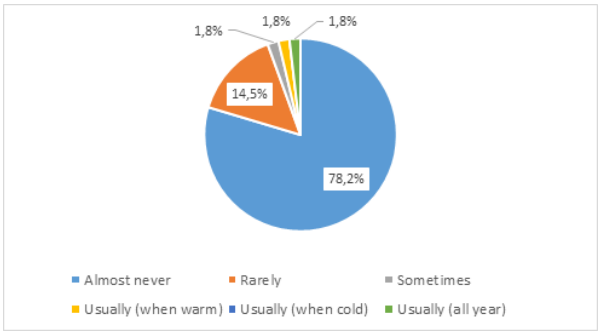


Figure TR63: Bicycle use (Izmir)

Electric bicycles are viable lifestyle choices for traveling longer distances without carbon emissions. An uptake of electric bicycles would offer a possibility to decrease kilometres driven by car and increase the usage of bicycles for work and shopping travels. Among the respondents in Turkey, 4.6% already own an electric bicycle, whereas 58.1% either strongly or moderately agree that they intend to purchase an electric bicycle within the next five years. 17.2% disagree with the statement and the remaining 20.1% neither agree nor disagree. The results for Izmir are similar (see Figure TR64).

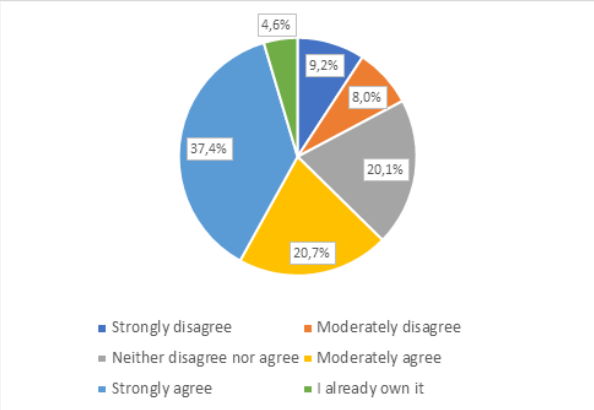


Figure TR64: Electric bicycle

Plane trips are also among significant sources of carbon footprint. Around 72% of the respondents from Turkey state that they have been on private flights, with 32% spending more than 6 hours, and 40% spending up to 6 hours per year on private flights. Concerning business trips, 13.6% of the respondents state that they have taken 3 or more business trips with a plane, and 26.6% state that they have taken 1 or 2 business trips with a plane in the last year (see Figures TR65 and TR66).

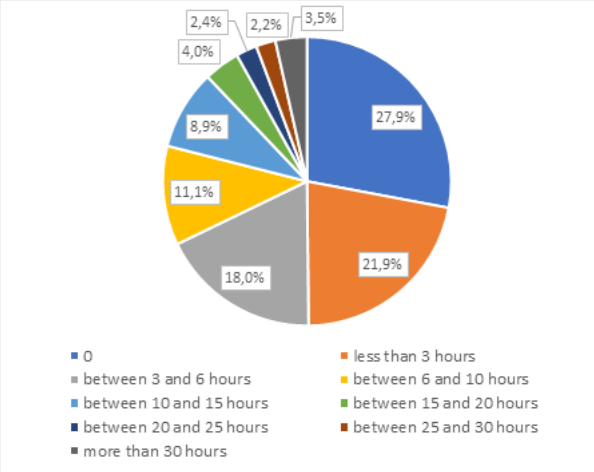


Figure TR65: Hours spent on private flights in the last year

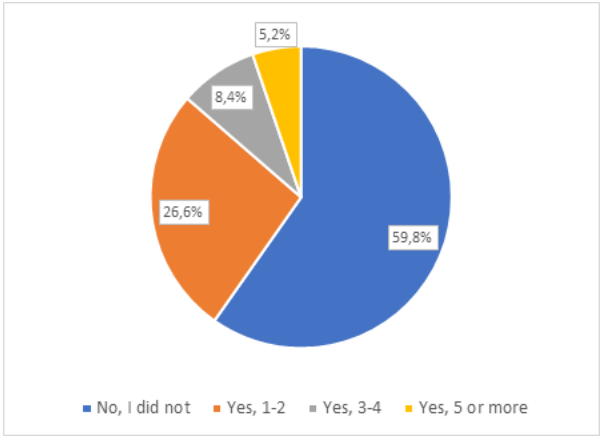


Figure TR66: Number of business trips with plane in the last year

Buildings pertain to a number of lifestyle choices that are key components of energy-related issues. In this respect, the type of house and the indoor living space are significant determinants. Most of the respondents (71%) live in apartments. 17.7% live in single family homes, and 8.6% live in semi-detached or terraced homes. The indoor living spaces are mainly 91 to 110 square meters (22.2%) or 111 to 130 square meters (21.2%). 16% of the dwellings are 131 to 150 square meters, and 14.1% are 71 to 90 square meters (see Figures TR67 and TR68).

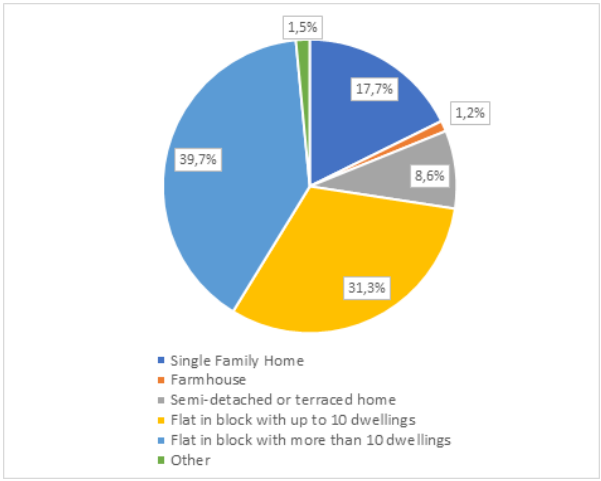


Figure TR67: Types of dwellings

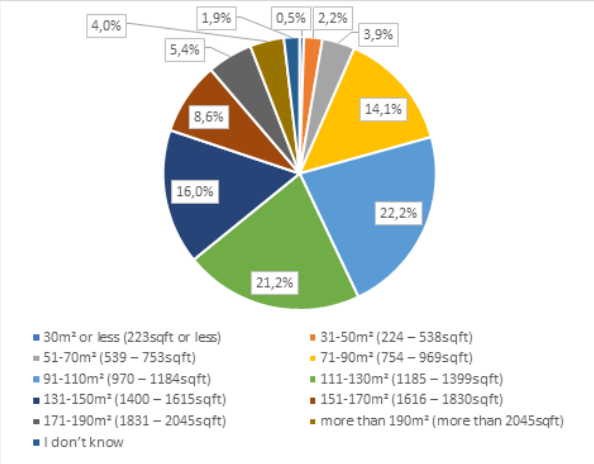


Figure TR68: Indoor space areas of dwellings

Most of the houses (64.8%) use central heating, and 14% use district heating. The primary heating fuel is gas (80%), followed by electricity (9.6%). For the case of Izmir, there is considerably lower use of central heating and gas as heating fuel. (52.7%) use central heating, and 10.9% use district heating. For Izmir, the primary heating fuel is gas (58.2%), followed by electricity (25.5%) (see Figures TR69 - 72).

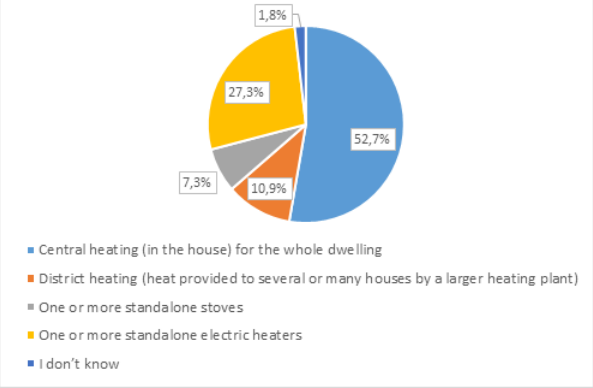


Figure TR69: Heating (Izmir)

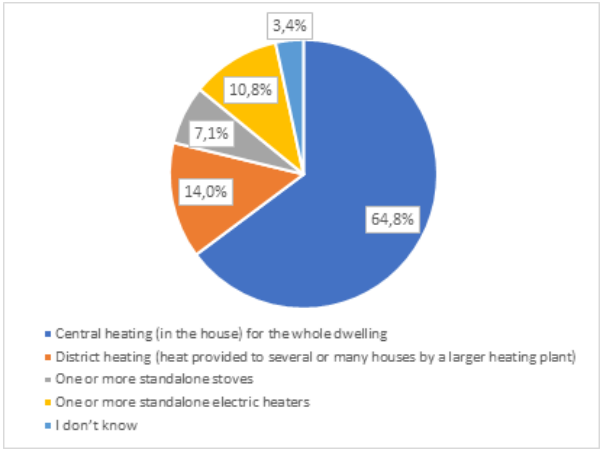


Figure TR70: Heating (Turkey)

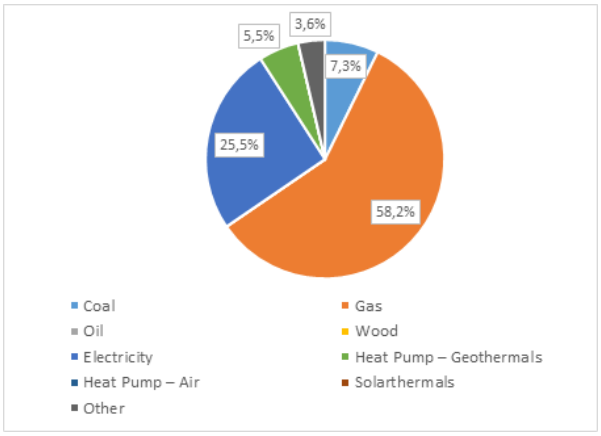


Figure TR71: Primary heating fuels of dwellings (Izmir)

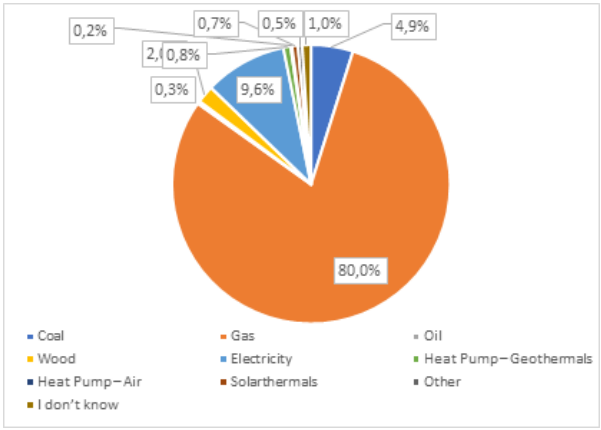


Figure TR72: Primary heating fuels of dwellings

Typical lifestyle choices regarding buildings involve the usage pattern of air conditioners, the preferred room temperature, disconnecting electric appliances (TV, PC, Notebook, DVD-Player, etc.) from the power supply when not using them. Regarding the use of air conditioners, 50% of the respondents from Turkey either have no air

conditioner, or almost never use them. This rate is only 20% for Izmir. On the other hand, 26.6% use air conditioners regularly or often. Concerning the preferred room temperature, around 50% of the respondents have about average preferred room temperatures, 18% have cooler, and 32% have warmer preferred room temperature setting compared to other people they know in Turkey. Among the respondents in Turkey, 55% often or always disconnect electric appliances (TV, PC, Notebook, DVD-Player, etc.) from the power supply when not using them, 16% do occasionally, and 29.1% never or rarely disconnect electric appliances from the power supply when not using them. The results for Izmir are similar (see Figures TR73-75).

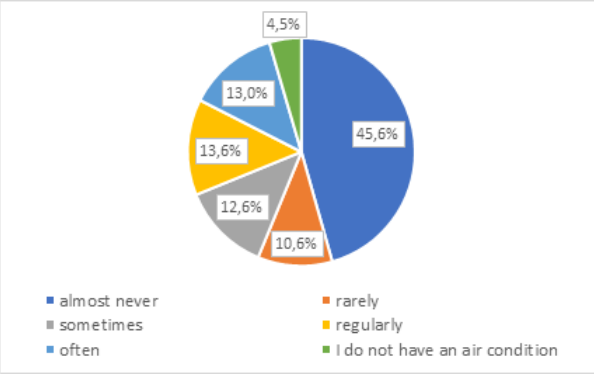


Figure TR73: Air condition use

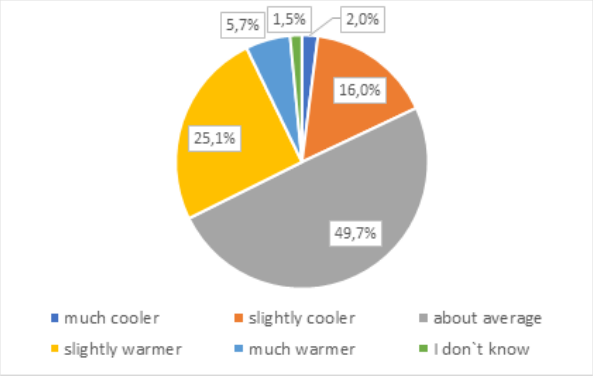


Figure TR74: Room temperature

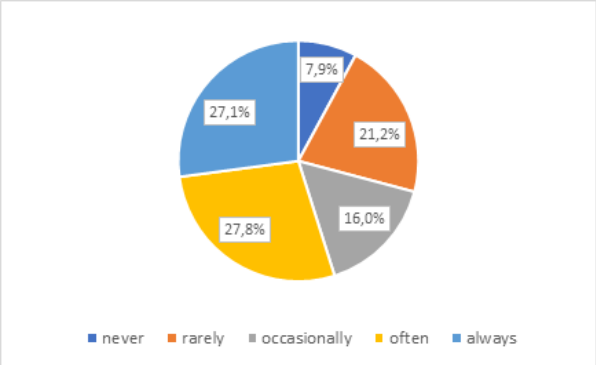


Figure TR75: Disconnect electric appliances

A more strategic set of lifestyle choices involve electricity providers. 25.6% of the respondents in Turkey purchase their electricity from a provider with a particularly high share of renewable energy production, 33.3% do not, and 41.1% do not know whether they purchase electricity from a provider with a particularly high share of renewable energy production. For Izmir, we observe higher rates. 30.9% of the respondents in Izmir purchase their electricity from a provider with a particularly high share of renewable energy production, 30.9% do not, and 38.2% of the respondents do not know. (see Figure TR76)

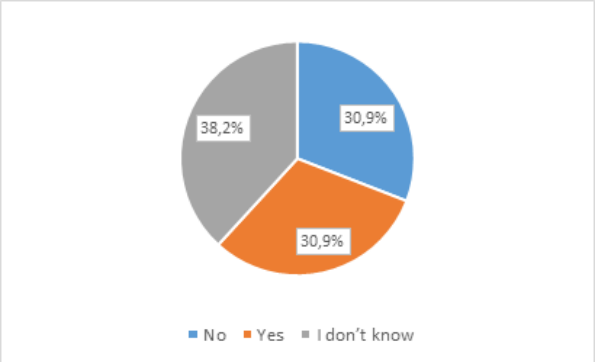


Figure TR76: Purchase electricity from green provider (Izmir)

On a more advanced level of collaboration, individuals may contribute to demand management, allowing their grid operator to remotely switch on and off non-critical appliances in their homes, and receive discounts in return. 18.6% state that they would definitely allow their grid operators such action, 34.7% state that they would probably allow it. A high share of 26.9% are unsure, and 32.1% state that they would

probably or definitely not allow it. The percentages for Izmir are similar to those of Turkey (see Figures TR77 and TR78).

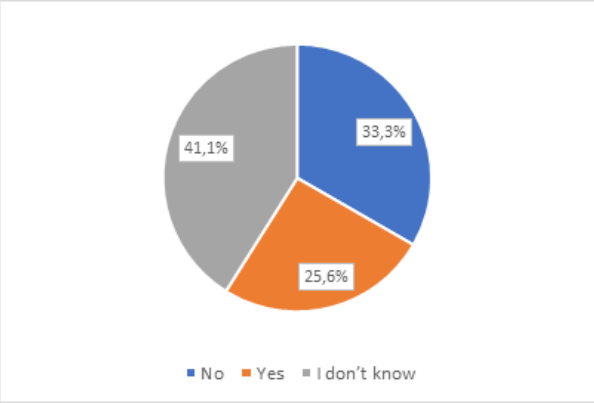


Figure TR77: Purchase electricity from green provider

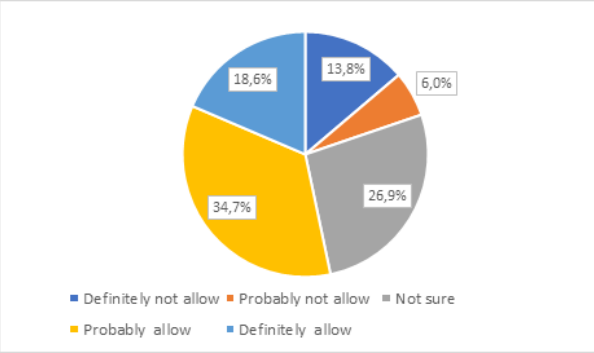


Figure TR78: Respondents who would allow their grid operator to remotely switch on and off non-critical appliances in their homes

4.1.9.5 Interim Conclusion and Suggestions

Assessment of the ECHOES survey Database provides significant results and suggestions for targeted policies.

The demographic profile of the respondents points to a young population with high education levels. The dynamism of the young population and the high education levels are convenient levers for stimulating the changes and adapting the lifestyle choices deemed necessary for energy transition.

Concerning the climate change-related results, there is a high level of awareness regarding temperature rise and the role of human activities in temperature rise as the principal cause. This high level of awareness might be exploited in policymaking for using responsibility as a driver of climate action.

When energy behaviour/attitude related results are analysed, several key outputs can be identified. To begin with, the strong interaction between the individual and the community/ society is repeatedly demonstrated by the answers to a number of survey questions. However, this interaction can be realized in both ways, as a negative interaction or a positive interaction. That is, the low trust of individuals in the society concerning their energy behaviours and choices may also negatively affect the individual's behaviours and choices. To this end, policies fostering and supporting the positive interaction between the individuals and the community/society need to be developed and implemented.

Regarding both climate change and energy behaviour related results, the respondents from Izmir have higher awareness and seem to have adopted or keen to adopt environmentally friendly lifestyles. However, the trust in community is lower for the respondents from Izmir.

The deployment of renewable energy is essential for energy transition. In this respect, the perceptions of the respondents from Turkey are promising. The majority agrees with the social and economic benefits of renewable energy deployment (such as creating new jobs) as well as its environmental benefits. Moreover, the individuals are keen to use renewable energy. Although the support for energy policies diminishes as they induce higher costs (e.g., increase in the prices of fossil fuels), there is nevertheless considerable support for pro-environmental energy policies. This outlook can be utilized through policies that enhance the deployment of renewable energy, adaption of energy policies and triggering lifestyle changes.

Energy policies find a strong acceptance and higher costs seem not to be a significant barrier. Renewable energy sources are considered as an influential factor both in an environmental and economic sense. The vast majority of the respondents is aware of the importance of the individual and only less than half of the group in achieving changes. These attitudes are a solid basis for accepting the need and the meaningful impact of changes in human actions. This reasoning is underlined by an actual interest of 66% in a real investment in renewable energy.

The individual-community relationship is further stressed when the lifestyle-related results are considered. Lifestyle changes can be released more easily and contribute to energy transition through community support. However, it should also be noted, as evidenced from the respondents' perspectives, that the individuals perceive higher potential for contribution to energy transition individually as compared to the community contribution potential. Policies emphasizing co-benefits of climate-friendly lifestyles may be utilized in this respect.

Although not totally reflected by the individuals' behaviours, there is strong indication from the respondents that the individuals are willing to take responsibility for supporting energy transition. To this end, policies targeting the incentivisation of this mind-set and providing mechanisms for the involvement of citizens in energy transition need to be prioritized.

The infrastructural barriers pose significant challenges for lifestyle changes and choosing climate-friendly lifestyles. The high rate of fossil fuel usage in public transportation (especially buses) in Turkey, for instance, triggers the perception that public transportation is not environmentally friendly. As this perception persists, it becomes more difficult to achieve lifestyle changes regarding, for instance, private driving. The socio-cultural roots of private driving also add to this challenge. Such barriers regarding lifestyles also adversely affect the development of sustainable transportation systems using e-vehicles or bicycles. Targeted and determined policies are needed to overcome these challenges.

Many of the lifestyle choices pertain to households and buildings. These range from everyday habits of electric appliance use, energy savings practices, or heating and cooling to more strategic lifestyle choices that may involve collaboration with the players of the energy system. Regarding the more everyday choices, policies that aim at increasing awareness, providing ease with environment-friendly lifestyle choices and supporting individuals (e.g., for house renovations) need to be prioritized. Concerning more strategic lifestyle choices involving, for instance, electricity providers with high share of renewable energy production, or allowing grid operators to remotely switch on and off non-critical appliances for demand management, policies that emphasize and facilitate the role of individuals and communities in the energy system need to be developed.

4.1.10 Baku (Azerbaijan)

4.1.10.1Demographics

Since Baku is not covered in the ECHOES survey, a new survey was designed and implemented in Baku. This report is based on the results of the survey conducted in Baku. The survey for Baku includes 266 respondents from Azerbaijan. The majority of the respondents are from the city of Baku. Thus, the assessment is done mainly on the city level.

Of all respondents from Azerbaijan, 43% are male and 90% live in an urban area, namely a town or city with more than 10 000 inhabitants. Most of the respondents are between 18 and 34 years old (58%), approximately 21% respondents are between 35 and 49 years old, 11% respondents for 50 and 65 age, 7% respondents for under 18 years old, approximately 3% respondents are above 65 years old (see B1).

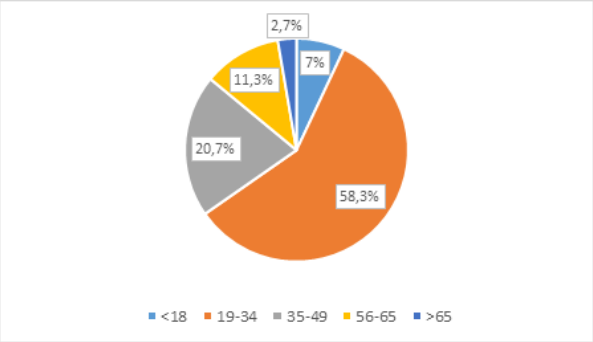


Figure B1: Respondents by age

As indicated in Figure B2, educational attainments in the sample are high with 31% bachelor education, 28% master level, 20% PhD, 18% secondary school students and approximately 3% respondents obtained up to other education levels.

All in all, the sample presents a young, highly educated group (see Figure B3).

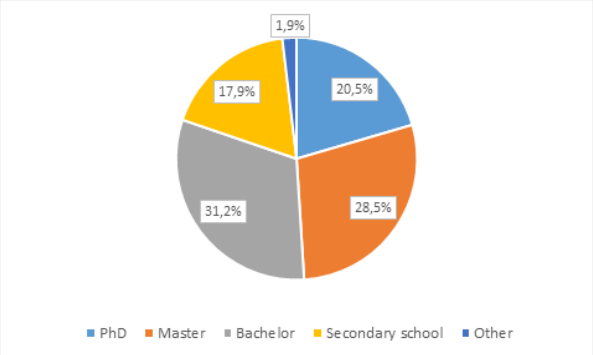


Figure B3: Respondents by education level

4.1.10.2 Assessment of climate change-related results with respect to themes and subthemes

Three questions directly relate to climate change. As Figure B4 shows, 50% agree with the damage of public transport to the environment in the city that the world's temperature has gradually been rising over the past 100 years. Only 5% disagree with the impacts to the environment.

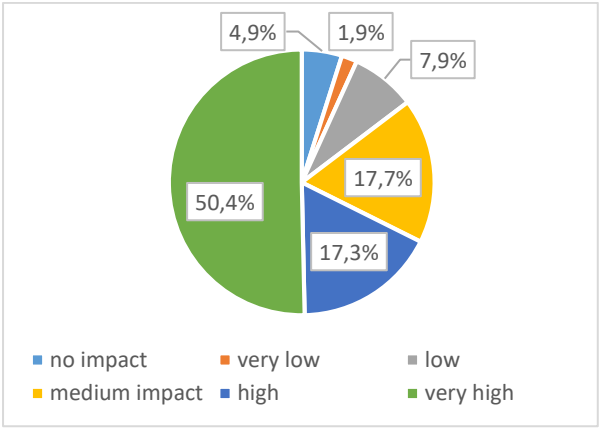


Figure B4: Level of agreement on the statement that public transportation damages the environment

And when asked if there is any information about climate change and its impacts, 70% of the respondents' state that they have sufficient information about climate change and its effects (Figure B5).

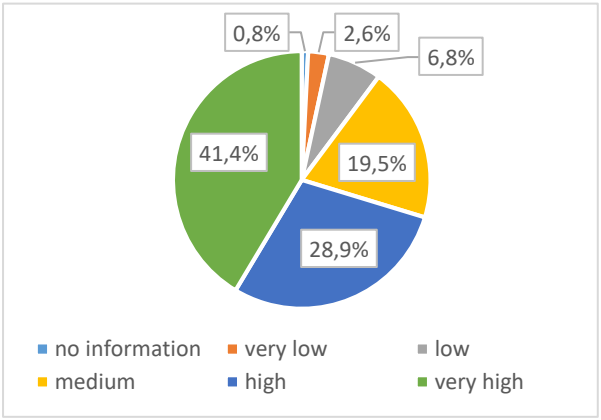


Figure B5: Climate changes possible effects

As Figure B6 shows, 6.1% agree with the statement that the temperature increase is the reason of natural processes and another 42.2% think it caused by human activities, but the majority (51.7%) of respondents' opinion focus on both: natural processes and human activities.

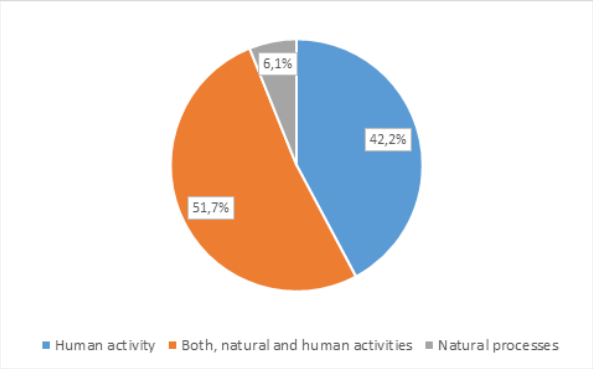


Figure B6: Climate change

4.1.10.3 Assessment of energy behaviour/attitude related results with respect to themes and subthemes

A considerable part of the ECHOES questions deals with respondent's energy behaviour and their attitudes towards energy related topics. 80% strongly agree that the use of more renewable energy sources (RES) will benefit the environment and another 12% agree moderately (Figure B7). Only around 1% does not think that using more RES benefits the environment.

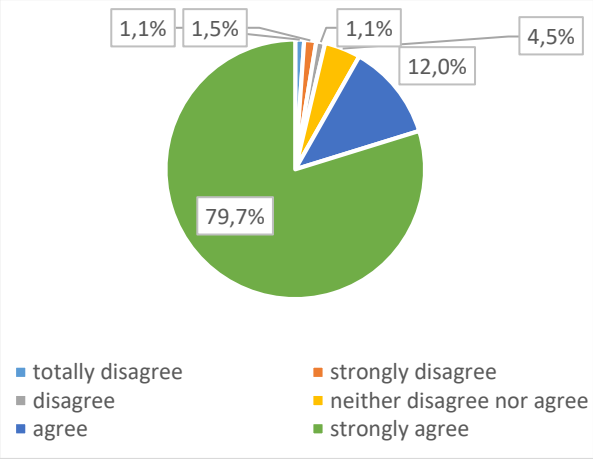


Figure B7: Ideas of society about using alternative energy sources

Questions about energy policies depict similar results. Figure B8 shows the acceptance of energy policies that protect the environment but induce higher costs. 91% agree or strongly agree with the statement, approximately 1% of respondents disagree.

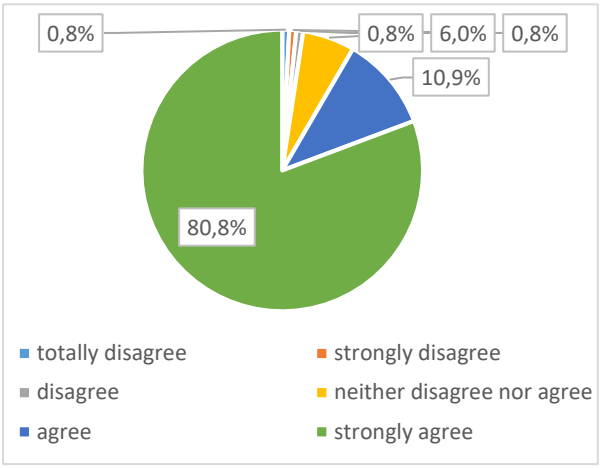


Figure B8: The acceptance of renewable energy policies

Figure B9 describes the relationship between human and environment. 35% respondents think that they see themselves as part of the nature. 27% of respondents accept that their relationship with the environment is relatively strong.

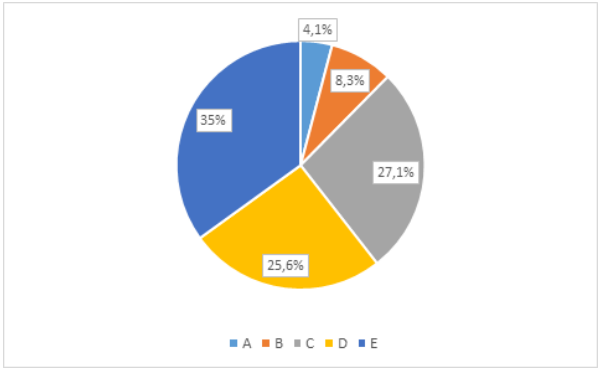


Figure B9: Assessment of whether the individual sees oneself as part of the environment

Public and private transports play an important role in the energy-life of individuals. Figure B10 displays the public transportation (PT) related results. Only 11% (strongly) agree that the public transportation system in their area is environmentally friendly. A majority of 82% (strongly) disagrees (see Figure B10).

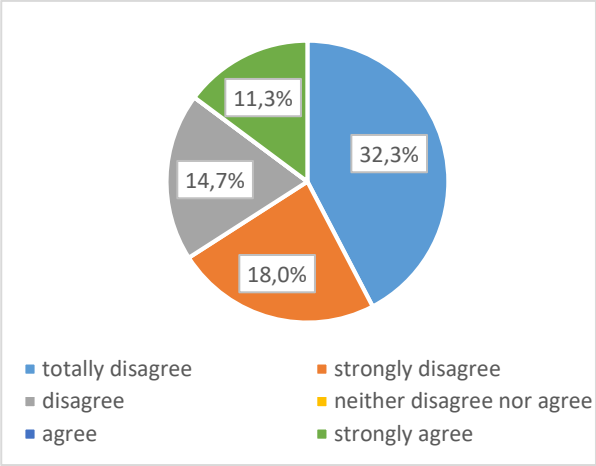


Figure B10: Public Transportation is environmentally friendly

4.1.10.4 Assessment of lifestyle-related results with respect to themes, subthemes, and focal areas

Looking at a specific number of trips using public transportation, public transportation is moderately well accepted, but seems however relatively well utilized in comparison. 21% of the respondents rarely use public transport on a weekly basis, even though this indicator includes travels to work or for shopping. 55% use it in most cases. These are likely to be individuals that commute using public transportation. 7% do not use public transportation. 13% of respondents prefer a taxi or a private car. Only 4% of respondents although they have own car, they also use public transportation for energy saving possibilities routinely (Figure B11).

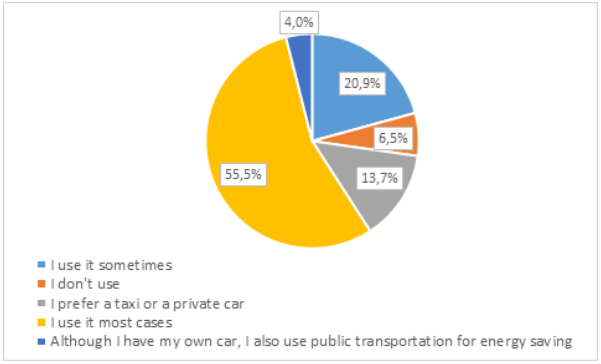


Figure B11: Using of Public Transportation

One of the most essential point effects on climate is daily transport. In fact, the number of transport vehicles increased by the time.

Mainly, people have their own car and they do not think about picking up anyone while driving. For that reason, the respondents were asked "How many people are usually with them (in that car) when they are in their own car or in someone else's car?" 53.4% of respondents mentioned they are with one, two or three people in a car (see Figure B12).

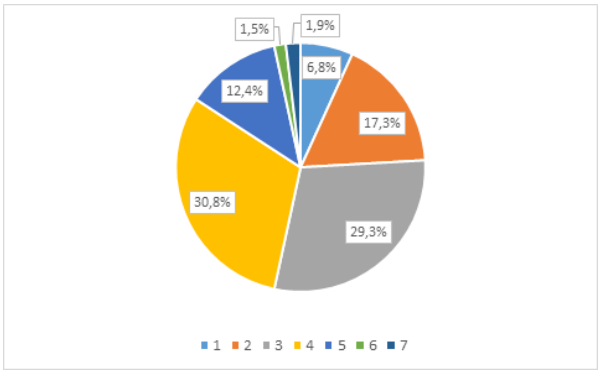


Figure B12: Number of passengers that people pick up on their cars

Cycling habitually, especially at a high intensity, helps lower body fat levels, which promotes healthy weight management. Moreover, it decreases stress levels, increases cardiovascular fitness, improves posture and coordination, stimulates heart, lungs and circulation, improves joint mobility, etc.

Knowing these benefits of cycling it was asked to respondents in the survey. As seen in the results of

the survey in Figure B13, 62% of respondents do not ride a bicycle, 24% rarely, 12% from time to time and just only 2% of respondents often go cycling.

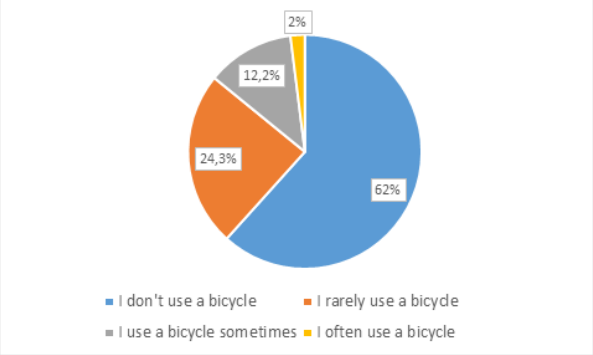


Figure B13: Cycling rate

Another important point is appropriate opportunities for cycling. In fact, in Azerbaijan most of the roads are not suitable for cycling.

The question was: If there are appropriate opportunities for cycling, would you use bicycles more? The majority of the respondents (57.1%) strongly agree that if there are appropriate opportunities for cycling, people would use bicycles more. Only a small amount of respondents (1.9%) completely do not agree with this opinion (Figure B14).

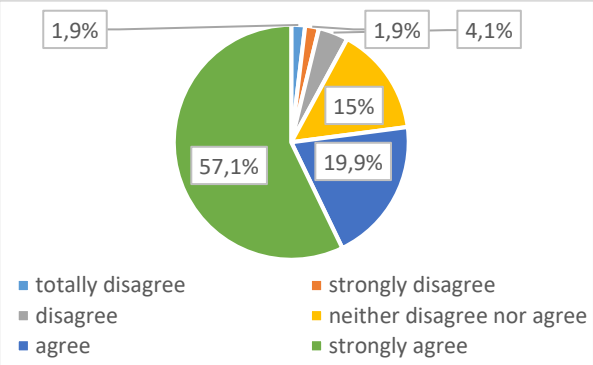


Figure B14: Appropriate opportunities for cycling

Two of the questions were about heating: heating methods for houses and how often they cook at home. As shown in Figure B15, a huge number of participants, 65% use natural gas for heating their home, 22% use electricity, 11 % oil and just a few, 2% use wood.

And according to the respondents' answers it is clear that a majority of them (84%-see in Figure B16) cook hot meals at least once a day, some percentage of them (14.4%) cook two or three times a day and just a few percent just do not cook at home and use restaurant services.

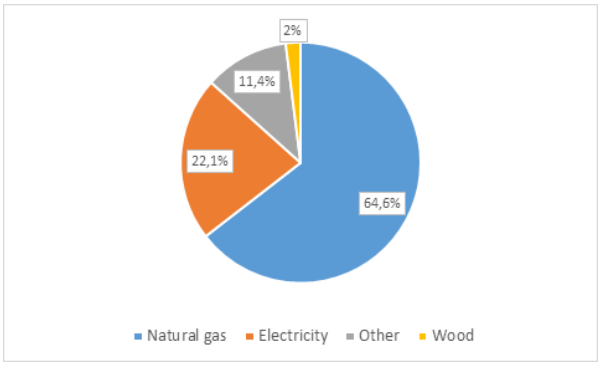


Figure B15: Preferring heating method

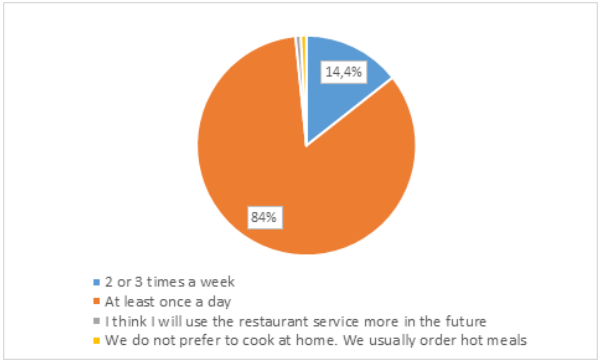


Figure B16: Intensity of cooking hot meals at home

The last survey investigation question was about personal obligation to save energy, for example, using public transport instead of a private car, turning off the lights when leaving the room, using technical devices that help save energy. Out of 266 respondents 156 of them say they feel a strong obligation to save energy, while 4 of them say they their contribution would be insignificant (Figure B17).

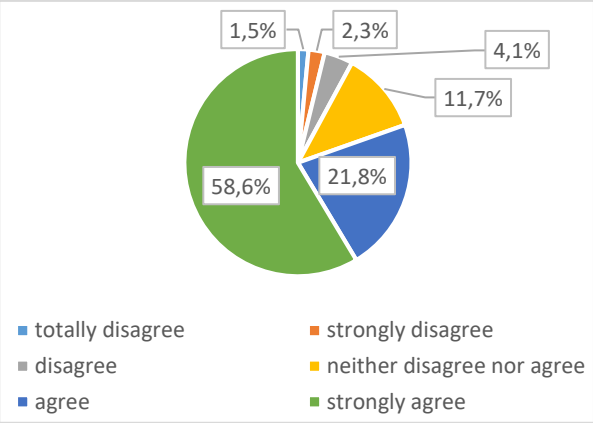


Figure B17: Personal obligation to save energy

4.1.10.5 Interim Conclusion and Suggestions

The assessments of the survey for the respondents in Baku provides important results and suggestions for targeted policies pertaining to energy transition.

The demographic characteristics of the respondents reveal that the majority of the respondents from Baku are young, with high education levels. The young and educated population profile enables the citizens to adapt lifestyle choices that might stimulate energy transition.

Concerning climate change related results, a high percentage of the respondents believe that the world temperature is rising and more than half report that they have information regarding the principal causes of climate change. This shows a high awareness regarding the phenomenon of climate change, which might be exploited in policymaking for using responsibility as a driver of climate action. Approximately half present their opinion on the assumption that climate change is a result of both natural processes and human activities.

Taking into account the energy behaviour and attitude related results, a set of key outputs are observed. Primarily, a vast majority of the respondents are aware of the benefits of renewable energy resources to the environment. The results pertaining to the respondents' perception for energy policies that protect the environment depict a similar picture. The respondents from Baku accept energy policies that protect the environment even if they induce higher costs. This implies that a high number of respondents in Baku internalize environmental issues.

Another significant output relevant to energy behaviour and attitude is about public and private transportation. Although the respondents are aware of the environmental issues and the role of public transportation in the energy-life of individuals, a very low percentage of the respondents (11%) agree that the public transportation system in their area is environmentally friendly while the majority (82%) (strongly) disagrees. This might be regarded as a technical and infrastructural barrier against the widespread use of public transportation. Therefore, improvements for the public transportation might be a policy suggestion for Baku.

When the lifestyle-related results are considered, the mobility behaviour of the respondents might be assessed. More than half use public transportation in most cases since the number of transport vehicles has increased. Private transportation is also widespread in Baku. Most people have their own private cars. In terms of cycling, the majority of the respondents believe that if there are appropriate opportunities for cycling, people would use bicycles more. To this end, policies that aim at increasing awareness regarding mobility behaviour and providing ease with environment-friendly mobility options need to be prioritized.

Individuals' lifestyle choices are also assessed with data regarding heating methods for their homes and personal obligation to save energy. In this sense, natural gas is by far the most preferred fuel for heating homes in Baku, followed by electricity. As for personal obligation to save

energy, the respondents' perception regarding using public transport instead of a private car, turning off the lights when leaving the room, and using technical devices that help save energy are evaluated. Accordingly, nearly 60% reported that they feel a strong obligation to save energy, which is a positive sign for the adoption of climate-friendly lifestyles.

4.1.11 Cape Town (South Africa)

4.1.11.1 Demographics

The ECHOES database does not cover Cape Town. Therefore, this section reports the results from a similar study implemented in Cape Town. Since the study is conducted more recently, it also involves comments regarding the Covid-19 pandemic and its impacts.

Cape Town is a city that, like South Africa, is characterised by a high degree of income inequality. This income inequality maps onto vastly different water and energy use patterns, as well as dramatically different transport strategies and costs. Based upon a review of the available data, we find suggestive evidence that there exist appreciable opportunities for consumption of water and electricity to reduce as a function of behaviour change. Electricity is generated with a very high dependency upon coal, with the result that 1kWh is associated with 900.6 grams of CO_2 output. As a result, reductions in electricity use are likely to meaningfully impact Cape Town's Greenhouse gas output. Evidence from the distribution of consumption across households of varying wealth, as well as a general lack of awareness of a household of its own consumption suggests scope for behaviour change in residential electricity consumption among upper income households especially. In transport, the pattern of peak usage suggests that there are both incentives, in terms of time, for high income car users to move to the local Bus Rapid Transport system, especially as congestion returns in response to Covid-19 lockdowns easing.

4.1.11.2 Cross-cutting factors and context

Income and inequality of income

South Africa is one of the most unequal countries in the world. The typical South African city, including Cape Town, sees large populations living in poverty a few kilometres from a smaller population living in luxury. This state of affairs is, at a structural level, a direct result of a policy of apartheid for much of the 20th century, and colonialism before that. Both of these, more or less, consecutive epochs saw especially black African people systematically disadvantaged in several important respects. First, access to education was conditioned along racial lines, with markedly inferior education offered to black African people. Second, jobs that draw larger compensation tended to be reserved de facto and, often, de jure for South Africans of European descent. Third, black Africans (and others of non-European descent) were (under threat of force) settled and housed in residential areas far from the centres of commerce in South Africa cities, necessitating long trips into work. Finally, South Africa was a very limited democracy until 1994, with black Africans excluded from voting for candidates, (or running as candidates themselves) to represent them in their government up until that point. Taken together this has the result that black Africans - the vast majority of the South African population - earned very little, were actively barred from acquiring higher levels of education, which is universally associated with improved life prospects, and lacked the franchise with which to change their circumstances within the institutions of state. The result of this is that South Africa arrived at the end of the 20th century with dramatic levels of income and wealth inequality with only a small portion of its population having benefitted from the long

post war boom, and the majority of its population is poor and not equipped with the requisite education to take advantage of a digitising economy. A further grim corollary of the stark lines along which these quite different economic outcomes was that by the end of apartheid in 1994, South Africa lacked the large middle class that was to be found in the larger and other middle sized economies around the world. These factors are worth noting now, because, to a large degree, South Africa remains a society that continues to be characterised in these ways. The middle class is vanishingly small, many live in exceptionally poor circumstances, inequality is high, and the poor, on average, must still spend a long time travelling between their home and their place of work, if they have a job. These realities cut through all of the specific areas that we will consider in this brief report.

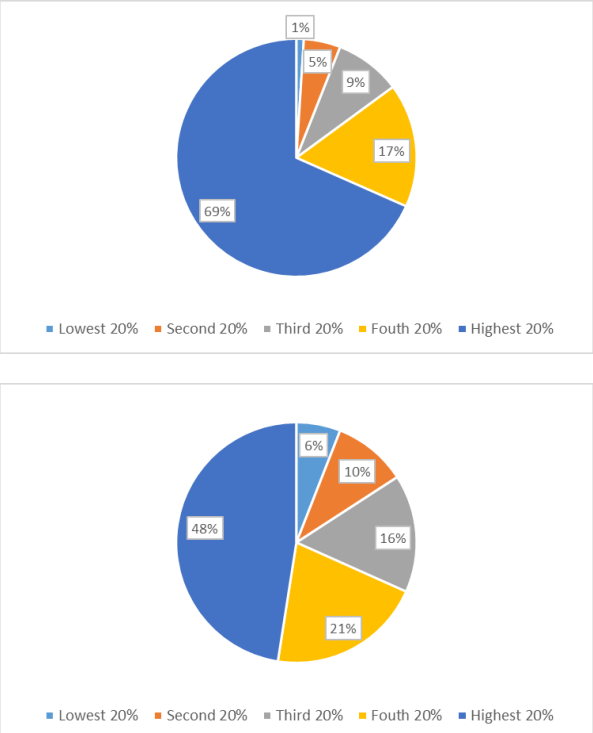


Figure CT1: South Africa's income inequality (upper) and selected emerging economy median (lower)

Source: International Monetary Fund (imf.org)

Coal as an important part of South Africa's energy mix

South Africa has large coal reserves and, as a result, for much of the 20th century built its energy generation around this reality. At the time of writing, South Africa generated 74% of its overall energy mix from coal and 87% of its electricity supply is generated from coal (see Figure CT2) (Marquard, 2021). Although the share of renewables in electricity generation is growing in South Africa, it is, right now, at a low level, accounting for only 7.6% of the energy generation mix (Marquard, 2021). The net result of this is that electricity use by residents of South Africa, including those in Cape Town, necessarily carries a large CO_2 cost: Per 1 kWh of electricity generated, 900.6 grams of CO_2 are emitted in South Africa (Marquard, 2021).

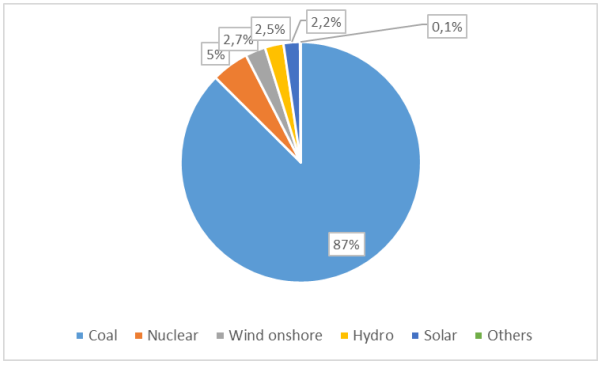


Figure CT2: South Africa's electricity generation mix

Source: Marquard, 2021

4.1.11.3 Energy and water use in the home

Cape Town has a high degree of electricity with well over 90% of formal households connected to electricity according to Jack and Smith (2020). Electricity use varies significantly with income levels as well as by metering technology. In Cape Town, as in the rest of South Africa, households can have a post-paid meter, or a prepaid meter. Prepaid meters account for most of the residential electricity meters in Cape Town. Reviewing a 10% sample of all prepaid meter users in Cape Town, Jack and Smith (2015) found that poorer households purchase electricity more frequently,

but to less than half the value of the wealthiest quartile of households in Cape Town. In a Randomised Control Trial in a poor suburb of Cape Town Jack and Smith (2020) found that switching to a prepaid meter led to approximately 2kWh less electricity use per day. This suggests that the margin for saving electricity is likely to be largest among richer households, and then among households without a prepaid meter. Literature from one of the largest behavioural interventions in energy - the OPower Home Energy Reports - strongly suggest that as households are motivated by behavioural interventions to consume less, one of the major channels through which this change is affected is through the purchase of more efficient capital (Brandonet al., 2017; Allcott and Rogers, 2014). Richer households in Cape Town are more likely to have access to sufficient liquidity at the time of any behavioural intervention, to make these investments.

Apart from structural differences in income and wealth, awareness along many margins of energy efficiency appears to be a significant barrier to achieving energy efficiency. This arguably begins with South African electricity and water bills being difficult to understand and (for post-paid electricity meters and water meters - which are all post-paid) arriving long after consumption has happened (Slabbert, 2010). In a lab experiment setting, using hypothetical bills modelled on the City of Cape Town's water and electricity bills as the control (Brühl et al., 2019) and that redesigning bills to make more use of bar graphs to represent consumption, and employing a more logical flow of information in the bill appreciably increased comprehension as well as satisfaction. This is consistent with what Smith and Visser (2014) found in a randomised control trial involving over 200 000 Cape Town households. In this study Smith and Visser (2014) found that the behavioural communication that was responsible for most of the observed water consumption reduction were those that involved simply making a household's own water consumption more salient to itself.

Energy efficiency opportunities are frequently overlooked due to the simple fact that consumers are unaware that they exist. Consumers are often unaware of the level of energy consumption specific appliances use or how to choose more energy efficient appliances. Nel et al. (2016) use data from an online survey to investigate the awareness of energy saving measures for electric hot water heaters. They note that convenience is a key factor in consumers' willingness to implement curtailment actions; users do not understand the energy consumption of their electric hot water heaters and they do not know how to control their electric hot water heaters efficiently. The Survey on Energy Related Behaviours the Department of Energy (DOE, 2013) asked residents if they were aware of energy saving measures. They found that a large proportion of South Africans were aware of energy saving measures regarding lighting, but much fewer people were aware of energy saving measures which related to hot water heating. For example, 89% of households were aware of the energy savings from switching off light bulbs, however, only 28% were aware that insulating their geyser would lead to greater energy saving. Similarly, a study by Williams et al. (2020) found a lack of understanding and implementation of energy saving behaviour among high-income households. Hughes and Larmour (2021) show that using standards and labelling was efficient in reducing energy consumption in South Africa, suggesting a role for increasing the salience of energy savings opportunities, too.

One of the most dramatic climate threats facing Cape Town arose from a long drought that depleted Cape Town's stored water resources to the point that there was a real threat that Cape Town would run out of water by May 2018. Deploying several policies in concert, including aggressive price rises, pressure reduction and awareness campaigns - including those that involved behavioural nudges such as social comparisons, the City was able to dramatically reduce residential water consumption. Since the

passing of the day zero crisis, two important trends have emerged, both of which are evident in Figure CT3. The first is that seasonal volatility of previous years is much diminished, the second is that water use is trending back up. Although it is difficult to know with certainty why this is so, it is suggestive of how capital investments and behavioural interventions can combine. Over the period of the drought, households in Cape Town invested in water augmentation strategies and more efficient water using capital (Greencape, 2019, pages 40-41). Increased capital investments of this sort allow for large water use categories to be switched away from municipal water (such as through installing bore-holes to all swimming pools and water gardens), and mechanically reduce water used per each time that capital is used (such as more efficient shower-heads). However, as the threat of drought-related water shortages has receded it is entirely possible that the reductions due to behavioural changes alone may have receded, too. This would be consistent with increased use of now more efficient capital (for example, showering more often, or for longer), with these uses, or the larger uses, truncated by water augmentation (such as boreholes on residential property). This hypothesis, although difficult to prove, is consistent with what we see from trends in google search for save water from Cape Town users of google search. Taken together, this suggests that there is likely to be a large marginal effect upon residential energy saving through reduced electricity and water use that is possible through nudges that re-focus residential attention upon more efficient use of these scarce resources.

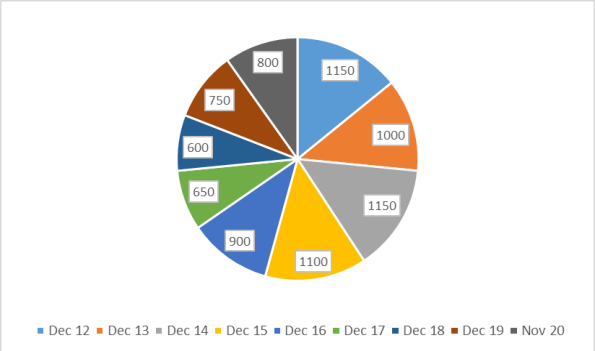


Figure CT3: Water usage (millions of liter per day) in the City of Cape Town: January 2013 to 18 October 2021 (From the City of Cape Town's weekly water dashboard - accessed 25 October 2021, 8:45am)

4.1.11.4Recycling

Recycling by the residential sector in South Africa as a whole is low, as measured by the percentage of households sorting waste for recycling (10.8%). Households in the Western Cape, sort waste for recycling at the highest rate (20.3%) in South Africa (see Figure CT4). The City of Cape Town is located within the Western Cape and is the largest population concentration (approximately 2 out of every three people in the Western Cape lived in Cape Town as at the last national census in 2011), so this is likely to give a good indication that the rate of sorting waste for recycling in Cape Town is low. This suggests that the margin for increasing sorting of household waste remains appreciable. A further barrier is likely to exist on the supply side. At present there are still relatively few arms engaged in processing waste, or discarded household goods, for re-use in the circular economy. For example, there are only 33 plastic recyclers in the Western Cape. This strongly suggests that households will struggle to match their recycling demand. Providing this matching service is likely to contribute significantly to increased recycling output from households.

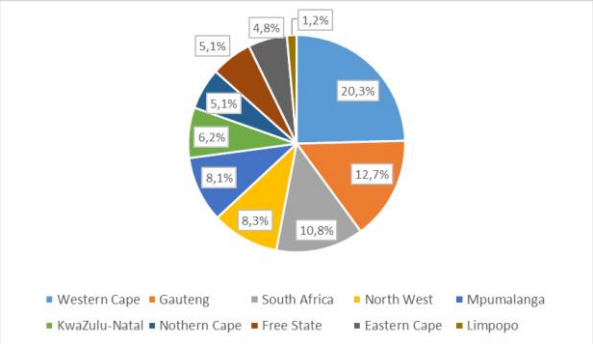


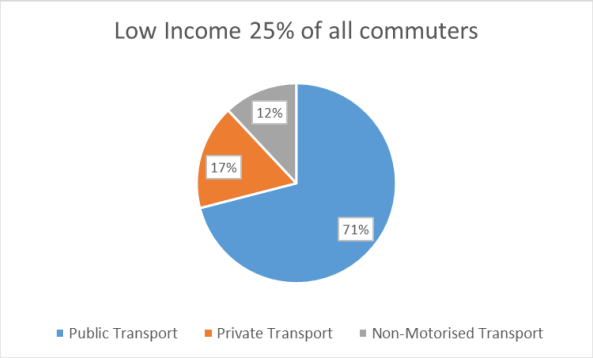
Figure CT4: Recycling by province

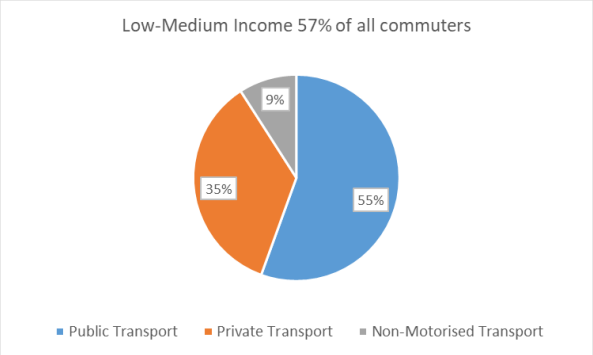
4.1.11.5Transport and commuting

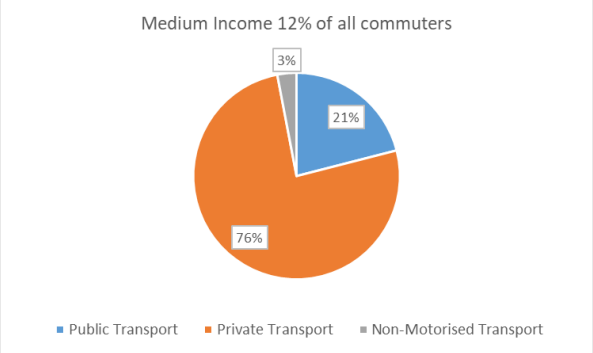
Income remains an important determinant of transport around Cape Town in three respects. First, as summarised, the number of modes people have access to is increasing with income. Poorer households in Cape Town lean heavily on public transport modes. Second, as also summarised, the poorer residents of Cape Town are also the most numerous commuters around the City of Cape Town. Third, these poorer commuters are located far from the centres of employment and economic activity in the City of Cape Town - this means that, for the overwhelming majority of these poor, non-motorised transport (NMT) is not an option to get to work, or to look for work. Another result of this is that the poor tend to spend larger shares of their income on transport than people in other income groups. The City of Cape Town estimates that the poorest 25% of Capetonians spend more than 10% of their income on transport (see CT5).

That said, in terms of mode split, it is the richer groups who make even less use of NMT to get to work. The richest segment sees only 2% using NMT to get to work, while 12% of the overall population (still a small number) use NMT to get to work. The sheer magnitude of these differences strongly suggests a margin for moving some percentage of higher income workers from private cars. There is certainly a need. The City of Cape Town estimates (2021) that eighty percent of peak traffic (6am-10am) in Cape Town is made up of privately car users. Since Greenhouse gas emissions from private cars are increasing with the degree of congestion (given the stop-start nature of driving this enforces), this suggests an additional margin for reducing greenhouse gas emissions from private car travel: reducing the time-concentration of motorised transport on the road.

One of the major factors in the City of Cape Town's broader transport system is the fact the rail network frequently fails. The rail service - the central line - to the largest population areas (Cape Flats and Khayalitsha) has been closed since June 2019 and now has approximately 8 000 informal settlers who have built make-shift housing over the rail lines. The train network in Cape Town, known as Metrorail, is run by the Passenger Rail Agency of South Africa (PRASA) and not by the City of Cape Town municipal government, this meaningfully inhibits the scope of action which it is possible for the municipality in regard to the rail network in Cape Town. In a 2015 survey by PRASA, approximately 65% of respondents reported being dissatisfied, or very dissatisfied with the reliability, availability, and accessibility of Metrorail's service. This makes sense given that Metrorail has gone from running 90 train sets (with 4 spare) in the year 2000 to running only 86 in 2014. The low level of rail service, however, has meant that commuters have largely been forced onto road-using modes and has led to the unusual situation whereby while Cape Town's population has grown dramatically over the past two decades, fewer people rode the train in Cape Town in 2014 (608533) than in 2000 (675607). Recently, Metrorail ceased selling its monthly tickets and now only sells more expensive daily tickets. This has further pushed more of the remaining rail commuters onto the road. As a result, it is unlikely that CAMPAIGNers has much scope, itself, to nudge commuters to rail, in Cape Town.







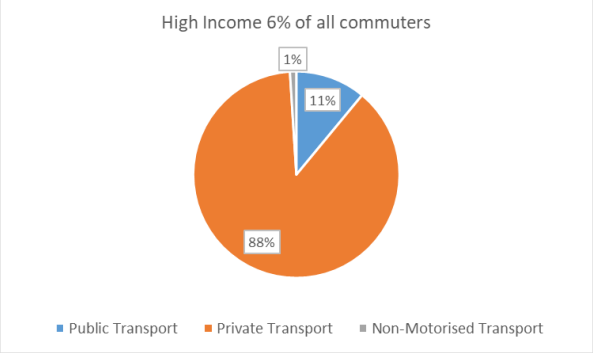


Figure CT5: Income and mode in the City of Cape Town.

Source: City of Cape Town, Comprehensive Integrated Transport Plan, 2018-2023 (pg. xii)

Over the last decade, Cape Town has progressively rolled out its own Bus Rapid Transit (BRT) system, known as the MyCiTi buses. These buses are now available largely along routes stretching north, east, and along the western seaboard of Table Mountain. A review of the utilisation of these routes indicates a surprising heterogeneity of utilisation over the peak period. Many routes, from high population densities, are utilised beyond their capacity. Other routes, however, many for higher income areas display utilisation rates between 40% - 75% over the peak. These same routes are more or less parallel to roads that are congested with cars over the peak. This strongly suggests an appreciable marginal gain that is possible in terms of moving private car travellers onto the My Citi, and public transportation in Cape Town (see CT6).

Figure CT6: Cape Town's transport network

Source: TDA (2017) in Summary of the Draft Municipal Spatial Development Framework of the City of Cape Town 2017-2022 (Cameron, 2017)

4.1.12 Trujillo (Peru)

4.1.12.1 Demographics

The Province of Trujillo, located in the region of La Libertad, Peru, in South America, belongs to the northern macro-region, it has 11 districts: Trujillo, El Porvenir, Florencia de Mora, Huanchaco, La Esperanza, Laredo, Moche, Poroto, Salaverry, Simbal and Victor Larco Herrera. Trujillo qualifies as a metropolis with three districts in rural area and 8 districts in urban area (INEI, 2017), with an approximate population in 2020 of 1,034,881 inhabitants. According to the Health Management of The Region (2021), the population has been affected by the COVID19 pandemic. Since the report on Trujillo was prepared during the Covid-19 pandemic (as opposed to ECHOES survey which was conducted in 2018), some evidence regarding the effects of the Covid-19 pandemic is also provided.

Trujillo has a population whose monthly income is divided into strata A, B and C. Stratum A includes families with a monthly income of approximately S/.10,622.00[3]; stratum B corresponds to families with a monthly income of S/.5126.00 and stratum C includes families with an income of S/.3261.00. (UN Habitat, 2020).

In Trujillo, the economic activities developed are: Commerce, manufacturing industry, transport and communications, fishing, hotel, restaurant and tourism services, public administration, construction, telecommunications, electricity, gas and water services, agriculture (rural area) and some activities related to mining. Commerce is the largest sector, followed by the manufacturing industry, which is oriented to the manufacture of footwear and production of canned vegetables such as asparagus. During the year 2020, due to the COVID-19 pandemic, the food sector and the sale of medicines were in high demand in contrast to the other sectors.

In terms of education, Trujillo has public and private educational institutions at the initial, primary and secondary levels, and at the higher education level it registers technological and pedagogical institutes; 1 public university and 5 private universities, offering more opportunities to the community. The Regional Directorate of Education has presented a new curriculum, a model that seeks to prevail the regional identity and to modernise education towards sustainable human development.

4.1.12.2 Assessment of climate change-related results with respect to themes and subthemes

In 2017, Peru was affected by torrential rains as a result of the El Nino Costero phenomenon; The population of Trujillo was no stranger to this situation and faced problems of sanitation and water coverage (Figure TJ1 and TJ2), due to flooding when the El Leon, San Carlos and San Ildefonso streams overflowed, there is no total coverage regarding water and sanitation, and El Nino Costero exacerbated the situation. Although there is a National Sanitation Plan 2017 - 2021 Supreme Decree No. 018-2017-Vivienda, this need is not covered, and the local government also has a Plan of Measures for Adaptation to Climate Change, but it has not yet managed to improve the situation in the area. There is no drainage system to help reduce the impact of heavy rains, floods or other natural phenomena. There are areas in the Province of Trujillo where the water table is high, and this can be seen in the level of humidity in the infrastructure.

[3] 1 Nuevo Sol=0.22 EUR (as of 20.12.2021)

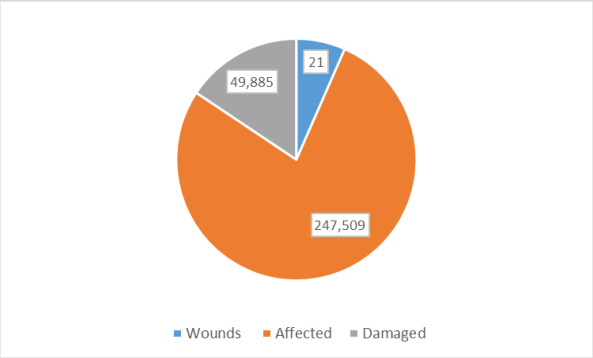


Figure TJ1: Effect generated by disasters in Trujillo

Source: ONU habitat (2020). Informe Local Voluntario – Trujillo, Peru | UN-Habitat (unhabitat.org)

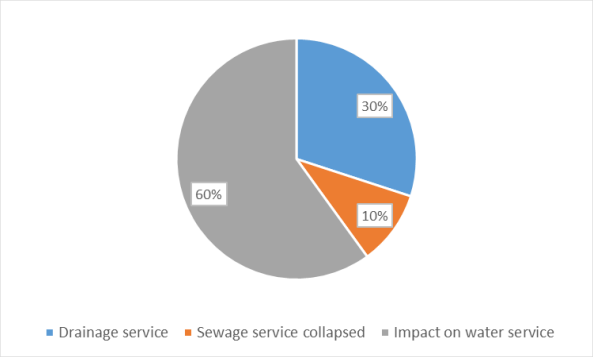


Figure TJ2: Impact on basic services by the Coastal El Nino Phenomenon in Trujillo, 2017

Source: ONU habitat (2020). Informe Local Voluntario – Trujillo, Peru | UN-Habitat (unhabitat.org)

This year there has been a marked variation in temperature, showing an effect on climate (Figure TJ3).

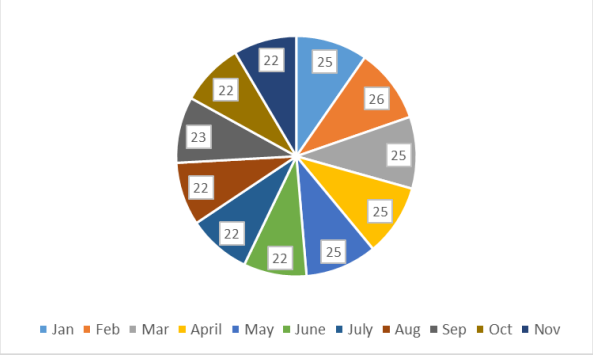


Figure TJ3: Average temperatures recorded in Trujillo, 2021

Source: https://es.weatherspark.com/

Another important aspect is urban transport, since in the last 5 years the number of vehicles has increased (Figure TJ4). There is a Sustainable Urban Mobility Plan for the City of Trujillo (MPT, 2021), with the participation of a Sustainable Urban Mobility Committee, in the framework of the DS 022-2016-Vivienda, with Mayor's Resolution N°085- 2018/MPT and N° 999-2018/MPT. The Plan consists of three phases: 1. Preparation and Analysis, having as final product a technical diagnosis; 2. Construction of scenarios and proposal of strategic framework; 3. Elaboration of measures within the period 2020 to 2030.

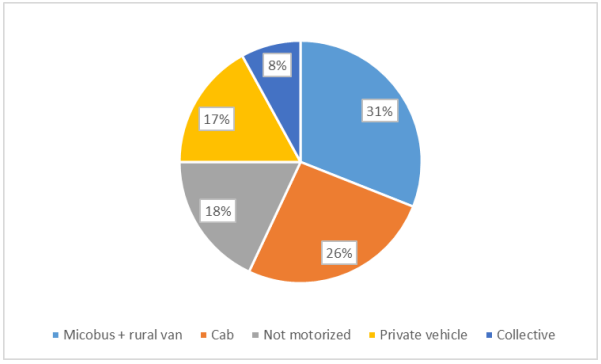


Figure TJ4: Percentage of travel demand by type of transport, Trujillo 2018

Source: ONU habitat (2020). https://unhabitat.org/informe-local-voluntario-trujillo-peru

The information on demand for types of transportation shows that the highest demand is for microbus (31%), followed by cabs (26%). Use of clean (not motorized) transportation comes third, with a 18% level of preference. Private vehicles have a similar rate of preference, 17%. Finally, collective transportation is preferred by 8% of the respondents.

4.1.12.3 Assessment of energy behaviour/attitude related results with respect to themes and subthemes

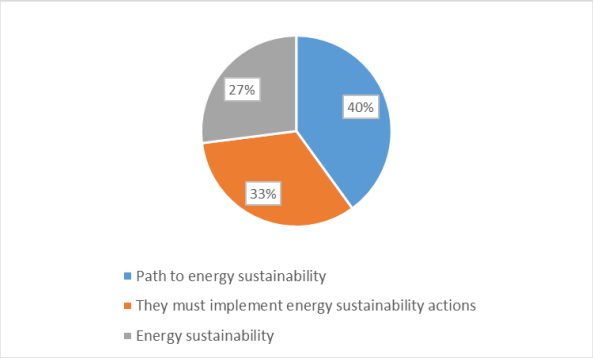


Figure TJ5: Perception of families and their attitude towards energy

Regarding the perception of the behaviour of the population and their attitude towards energy use, the results of a survey of 150 families, shows that 40% consider that they are on the way to energy sustainability, 33% do not yet apply actions in favour of energy sustainability and 27% have attitudes in favour of energy sustainability (see Figure TJ5).

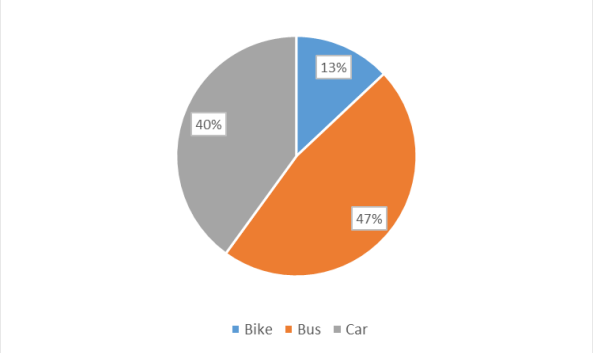
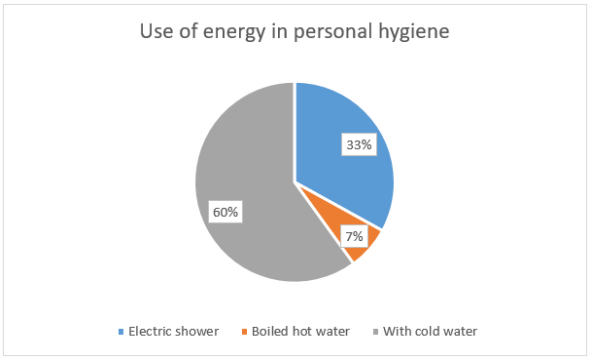


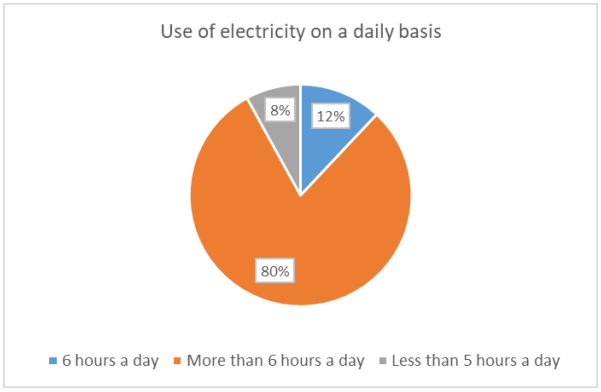
Figure TJ6: Type of transport

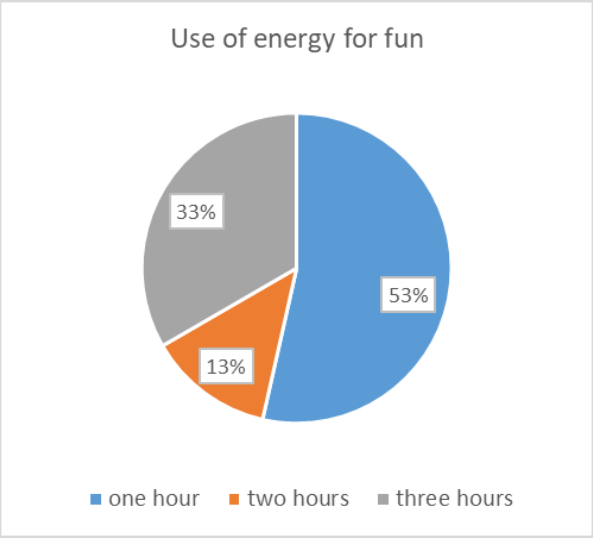
Regarding the use of transport to carry out their daily activities, it is shown that 47% of the families prefer to use the bus, which is the public transport that is shared by the greatest number of people, followed by the car (40%), and a very low use of bicycles (13%) (Figure TJ6).

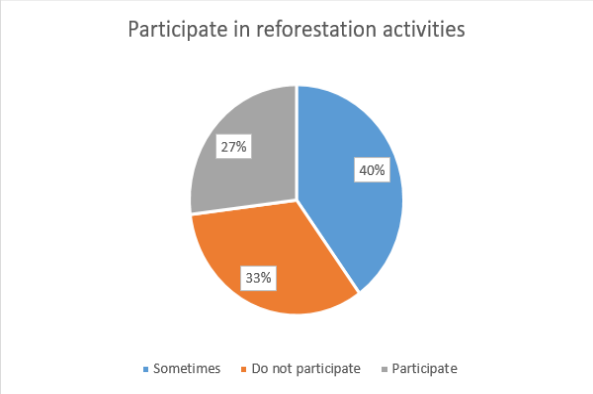
4.1.12.4 Assessment of lifestyle-related results with respect to themes, subthemes, and focal areas

Families and their daily actions, show a moderately responsible lifestyle with respect to energy. This is caused by provisions of the central government, since due to the COVID-19 pandemic, most of the members of the families stay at home, receive virtual classes, and thus use electricity more than 6 hours per day (80%), However, 40% of the families have at some point participated in reforestation activities and only 27% have reforested (Figure TJ7). Even so, 67% of them feel committed to carrying out actions to adapt to climate change.









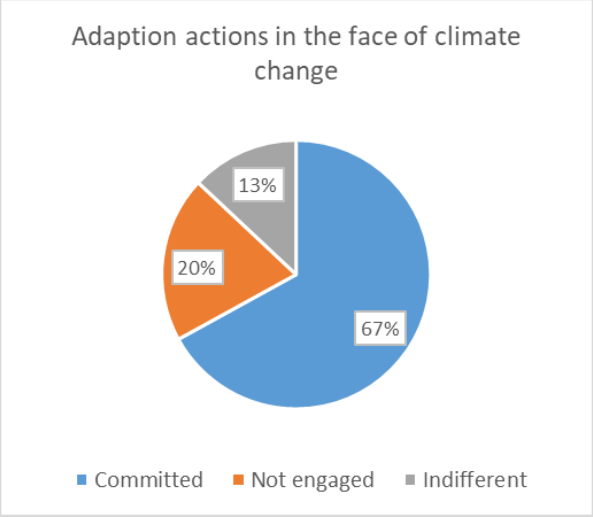


Figure TJ7: Lifestyle in relation to energy

4.1.12.5 Interim Conclusion and Suggestions

Trujillo has had problems with sanitation and water coverage, due to flooding from the overflowing of the El Leon, San Carlos, and San Ildefonso streams. Despite having a Plan of Measures for Adaptation to Climate Change, the situation has not yet improved, and the city does not have a drainage system that helps to reduce the impact of heavy rains, floods or other natural phenomena.

In recent times there has been a marked variation in temperature, affecting the state of the climate. In addition, the greenhouse gases generated by the uptake of the number of vehicles on the road increased, for which action has been taken with the approval of the Sustainable Urban Mobility Plan of the City of Trujillo, in the framework of the DS 022-2016-Vivienda, with the Resolution of the Mayor's Office N" 085-2018/MPT and N" 999-2018/MPT.

The energy behaviour of the population is at an initial stage, and requires raised awareness raising and information transfer, even though a survey applied to 150 families shows that 40% consider that they are on a path toward energy sustainability. In reference to transport, there is a tendency towards greater use of public transport (47%), which shows a certain positive trend, but nevertheless needs to promoted, as well as the use of bicycles.

In terms of lifestyle with respect to energy, it is difficult to make clear conclusions, since due to the COVID-19 pandemic, the population registers greater energy use at home. Educational classes are virtual, as well as various forms of entertainment. Thus, 80%report electricity consumption for more than 6 hours a day. Regarding personal hygiene the households contribute to reducing the impact to the environment, since 60% do not use energy. Further, the energy that is used in the province of Trujillo is

generated by a hydroelectric plant, which takes advantage of the water potential of the Santa River.

In the years 2019 and 2020, energy consumption shows an increase of 1.1% although, in 2020, the rural, semi-urban and urban areas of Trujillo experienced an increase in the energy sales tariff.

With regards to compensation activities by families against the impact generated by the use of energy, only 27% of the surveyed population has reforested, but families feel in general committed to carrying out adaptation actions in the face of climate change (67%). Concluding, it is suggested that local governments implement community-based environmental awareness and education projects, with effective climate change adaptation strategies.

5. Mapping of the Characteristics of Citizens to their Carbon Emissions

5.1 Analysis of Results

Analysis of the results of ECHOES survey and similar studies or reports involves 9 countries and 10 Lighthouse Cities. The countries are Austria, Finland, France, Greece, Ireland, Italy, Lithuania, Sweden, and Turkey, with Lighthouse Cities Baku (Azerbaijan), Cape Town (South Africa), Dafni and Skopelos (Greece), Dublin (Ireland), Freistadt and Linz (Austria), Izmir (Turkey), Lahti (Finland), Milano (Italy), Trujillo Region (Peru), and Vilnius (Lithuania).

The ECHOES survey questions are grouped under four main headings. These are: demographics, climate change, energy behaviour and attitude, and lifestyle related questions. The analysis of the city-level results and country-level results are presented in Sections 5.1.1 and 5.1.2, respectively.

5.1.1 Country Level Comparison based on ECHOES Survey

The city level assessments pertaining to the results of the ECHOES survey enable us to

understand lifestyles, lifestyle choices, and behaviours of citizens in the selected cities. To this end, the city level assessments were completed on the basis of a multi-dimensional analysis through common themes/sub-themes and focal points derived from the city reports prepared by Lighthouse Cities (LCs). However, Cape Town (South Africa) and Trujillo (Peru) follow a different methodology to assess lifestyles, lifestyle choices, and behaviours of citizens through a set of different variables. Therefore, their results were separately assessed. The themes/sub-themes and focal points that are common in other LCs were grouped under particular sections, including demographics, climate change related results, energy behaviour/attitude related results, and life-style related results.

Results of the ECHOES survey were analysed for 9 countries, Austria, Finland, France, Greece, Ireland, Italy, Lithuania, Sweden, and Turkey. The survey results were analysed with respect to demographics, climate change, energy behaviour, and attitude, and lifestyle related themes. In this section, the country-level results of the ECHOES survey will be assessed.

The highest number of participants are from Ireland, with 624 respondents, followed by Austria, Finland, France, and Greece each of which has an equal number of 604 participants. Other countries are Sweden (603), Italy (602), Lithuania (601), and Turkey (594). For each country, the majority of the participants are between the ages of 18-34.

The highest percentage of employed respondents belongs to Lithuania with 78%. Following that, France is with 73%, Ireland with 72%, and Italy with 70%. The highest rate of participants with higher education belongs to Turkey, Lithuania, and Italy.

Regarding the questions directly related to climate change in the ECHOES database, the country responses are listed below in Figure M1 and M2. Question 1 is "Most scientists say that the world's temperature has gradually been rising over the past 100 years. Do you think this has been happening?" and the second question is "Assuming that the world's temperature is rising, do you think this is caused mainly by natural causes, about equally by natural causes and human activity, or mainly by human activity?". The perspectives of the participants on climate change based on countries are as follows: Turkey has the highest rate with 70.2%, followed by Finland with 54.8%, and Greece with 54.5%. The country that least believes temperatures have risen in the last 100 years is Lithuania with 32.4%.

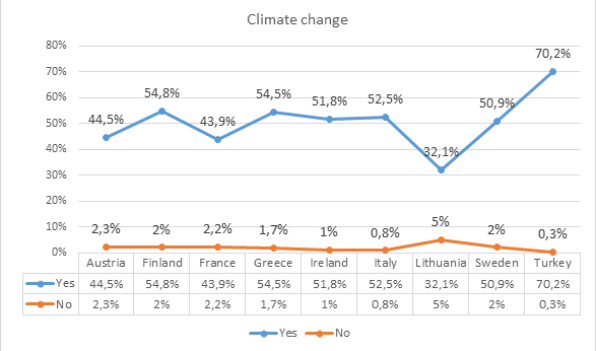


Figure M1: Perceptions of respondents regarding temperature rise

Regarding the causes of climate change, the majority of the participants in selected countries argued that climate change is mainly caused by human activities. The respondents from Turkey and Greece, with 75.7% and 67.7%, respectively, argued that climate change is human-induced. Equally, the participants who argue that climate change is caused by both humans and nature are from Lithuania with 53.2%. This is followed by France with 37.5%, Austria with 35.9% and Italians with 34.9%. Participants who argue that climate change is entirely caused by nature are from Austria with 10.6%, Sweden with 9.6%, France with 8,3%, Lithuania with 7.3%, and Italy with 7%. From a broad perspective, Mediterranean countries have a higher tendency towards perceiving climate change as mainly human-induced. Figure 4.167 shows below the results concerning the principal cause of climate change.

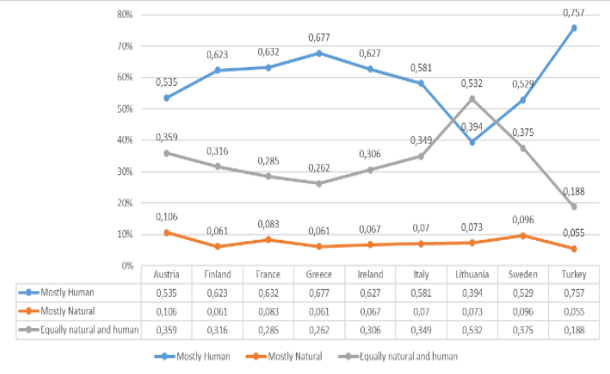


Figure M2: Principal cause of climate change

The results pertaining to the energy behaviours and attitudes have a significant place to measure the perspectives of the participants. Turkey has the highest ratio (72.7%) in terms of supporting the assumption that more renewable energy sources will benefit the environment. 60% of the respondents strongly agree in Ireland, Italy with 56%, and Finland with 55%, and Sweden with 51%. Figure M3 below represents the results of respondents' perception whether renewable energy resources benefit the environment.

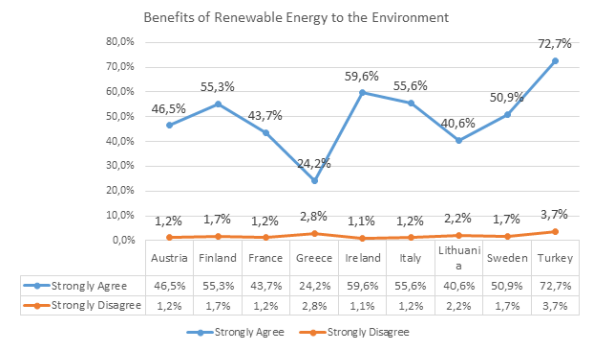


Figure M3: Respondents' perception on the benefits of renewable energy to the environment

Regarding the question whether the use of more renewable energy will increase employment, the answers of the participants generally include moderately agree instead of strongly agree. The rates of answers based on moderately agree are respectively France (42%), Sweden (32%), Finland (38%), Ireland (40%), Italy (39%), Greece (33%), Austria (38%), Lithuania (29%), and Turkey (28.3%). Similar to the climate change related results, the Mediterranean countries' perception on the potential of renewable energy resources to create new jobs is higher than in other countries.

Concerning the support for policies that protect the environment while inducing higher costs, the participants that strongly agree that they would support such policies is 34% for Turkey, followed by Finland with 20.2%. Other countries, respectively, are Sweden (15.6%), Ireland (12%), Greece (11.9), Italy (11.8), Lithuania (9.7%), France (6.8%), and Austria (2.2%). The respondents that strongly disagree are from Sweden (14.1%), France (13.2%), and Finland (11.6%). When the adoption of energy policies which create new jobs are considered, respondents from Turkey again rank first in terms of strong support for such policies, with 31.3%. Secondly, Greece is ranked with 18%, Finland with 17.1%, Sweden with 16.1%, and Austria with 15.6%.

Another set of questions in the ECHOES survey investigate the respondents' perception on the individual and collective contributions to energy transition. In this sense, the respondents that strongly agree with the possibility of contribution on individual and collective levels are Austria (16.4% and 24.8%), Finland (9.6% and 24.7%), Greece (21.2% and 27.3%), Ireland (18.9% and 24.7%), Italy (15.6% and 18.9%), Sweden (17.1% and 27.7%), Lithuania (6.5% and 14.5%), France (12.1% and 17.9%) and Turkey (30.8% and 7.9%). It is observed that, unlike other countries, respondents in Turkey feel that they can contribute less collectively than individually.

When the public transportation (PT) data were examined, the participants contributed assessments in 4 sub-headings. These are PT satisfaction level, environmentally friendly transportation, number of trips, and routine mobility. Concerning public transportation satisfaction level, 34.8% are very satisfied or satisfied with public transportation in France. For Lithuania a similar 38.2% and for Sweden a higher 46.2% of satisfaction with public transportation is observed. Italy and Greece 20.3% have low levels (around 20%), whereas Finland 44.5%, Austria and Turkey have high levels of satisfaction with public

transportation (around 40-45%). When the respondents' perception on whether public transportation is environmentally friendly or not is evaluated, the country with the highest fraction of respondents who find public transportation in there are environmentally friendly is Sweden with 42.7%. Other countries are Austria with 40.1%, Finland with 32.1%, France with 24.4%, Lithuania with 20.1%, Italy with 17.5%, Turkey with 16%, Ireland with 13.7%, and Greece with 10.1%. The majority of the participants of all countries stated that they use public transportation 1-4 times a week, with bus being the most often used mode of public transportation.

Regarding car sharing, 22.2% of French participants stated that they tried and liked it. 13.1% of the respondents from Italy state that they tried and liked car sharing with 13.1%. In Sweden, 60.9% of the respondents have never tried car sharing and are not interested. For Austria and Finland, these rates are 54%, for Lithuania 50.6, for France 45.5%, for Italy 44%, for Ireland 43.1%, and for Greece 39.1%.

Concerning the use of bicycles, the participants generally do not prefer bicycles to go to work or shopping. The countries in which people use bicycles all year round the most are respectively Sweden with 20.2%, Austria with 12.3%, Finland and Lithuania with 9.8%, France with 7.6%, Ireland with 6.1%, Greece with 3.6%, and Turkey with 2.2%. Compared to other countries, the respondents from Turkey are more eager towards owning an electric bicycle, with 37.4% of the respondents indicating that they plan to buy one. This is followed by Lithuania with 11.5% and Italy with 10.5%.

Information on household consumption patterns are gathered under four important subheadings. These are the types of heating in buildings, the use of air conditioners in summer, unplugging electrical appliances when not in use, and getting electricity from a renewable energy provider. Country data shows that most countries use central heating in dwellings as the main type of heating, except Finland. However, Finland's main type of heating is district heating with 38.4%. Although Lithuania's type of heating is central heating with 38.4%, their second-largest use is district heating with 32.4%. The use of air conditioning in summer has different answers for the participants because there are many countries with different climate types. For example, while 69.2% of the participants in Switzerland have no air conditioning, this rate is 4.5% in Turkey, 5.3% in Greece, and 3.7% in Italy. Examining Finland, another northern country, 68.9% of respondents do not have air conditioning, compared to 93.4% in Ireland, 78.3% in France, and 82.5% in Austria. Participants that use air conditioners the most are Italy with 11.1%, Greece with 23.3%, and Turkey with 13%. In general, it can be said that most of the participants unplug their electrical appliances once they are not using them, but the answers are equally distributed for each country. Finally, when the participants were asked whether they received their electricity from a renewable energy provider, it was observed that Austria gave a positive answer with 47%; however, 45.2% had no idea about their energy provider. The second country with the highest rate is Sweden with 43.3%. However, 44.8% stated that they did not know exactly likewise Austria. Finland is among the countries with the highest usage rate of 44.7%.

5.1.2 City Level Comparison

In terms of demographic characteristics, the share of respondents in terms of gender is 43% male and 57% female in Baku, 49% male and 51% female in Dublin, 53.4% male and 46.6% female in Austria excluding Vienna. Other LCs also have similar patterns in terms of gender distribution. As far as the distribution of respondents in terms of age is considered, it is seen that majority of the

respondents are between 18 and 34 years old in a set of LCs such as Baku (58%), Greece (35%), Dublin (44%), Austria excluding Vienna (33%), and Lahti (35%). However, the age distribution is slightly different in İzmir where 25.5% of the respondents are aged between 18 and 34 years, and 29.1% are aged between 35 and 49 years. The share of the respondents between 50 and 65 years of age is 38.2%. Similarly, the distribution by age in Vilnius city is slightly different; almost 30% of the respondents belong to 18-34 years and nearly 30% belong to 35-49 years old. Finally, in contrast to other LCs where the respondents were cumulated in relatively younger age groups, 40.3% of the respondents in Milan are 55 years old or older.

The demographic characteristics also have implications in terms of level of education and employment status. Accordingly, the level of education of the respondents in all LCs is quite high with either a university/college degree or a higher degree. For example, nearly 80% of the respondents have a university or higher degree in Baku while 61% of the respondents have a university degree in Greece. Similar results pertaining to level of education as the tertiary degree are also obtained in other LCs such as Dublin (65%), Izmir (65.5%), Lahti (53%), Milan (65%), and Vilnius (83%). On the other hand, in terms of employment status, it is observed that the majority of the respondents are paid employed in LCs such as Dublin, Austria excluding Vienna, Izmir, Lahti, and Vilnius with 77%, 66.7%, 45.5%, 55%, and more than 85%, respectively. With lower levels of employment, people might be less willing to pay for energy transition measures due to low levels of income.

The climate change related results pertaining to climate change is analysed through awareness for rising temperatures, major causes of climate change, and willingness to donate for climate change related solutions. In this regard, the majority of the respondents in LCs are aware of the phenomenon of climate change and agree that the world's temperature has gradually been rising over the past 100 years. In terms of information about climate change and its possible effects, Dublin comes first since 86% reported high consciousness of rising world temperatures, and only 3% disagreeing while 11% were not sure. This is followed by Milan and Baku with 71.4% and 70%, respectively. A similar pattern is also observed in Greece, as 54% of the respondents believe that the phenomenon of global warming is truly happening.

When the major causes of climate change are asked from the respondents, the vast majority indicated that climate change is mainly caused by human activities (69% in Dublin, 55% in F Austria excluding Vienna, 85.5% in Izmir, 62% in Lahti, and 85.2% in Milan). On the other hand, some of the respondents' opinions focus on the assumption that climate change is caused equally by both natural processes and human activities (51.7% and 60% in Baku and Vilnius, respectively).

Last but not least, the respondents also share their willingness to donate for climate change related solutions. Although the respondents are aware of climate change and its negative consequences, the majority of them did not want to donate some of their compensation provided in the survey. For example, despite high levels of information about climate change and human activities resulting in the phenomenon in Greece, 70% were not willing to donate, 19% would donate 1 euro and the rest would donate 2 (3%), 3 (3%), 4 (1%) or 5 (4%) euros when it comes to donating to combating climate change. Likewise, in Izmir, 80% of the respondents stated that they would not want to donate, and the remaining 20% of the respondents agreed to donate varying amounts of 1 Euro (10.9% of the respondents) to 5 Euros (1.8% of the respondents);

and in Lahti, 62% did not want to donate any of their compensation provided in the survey. This shows that although there is a high level of understanding of climate change and the responsibility of anthropogenic activities, there is no willingness to implement actions that would cost money.

When the energy behaviour/attitude related results of the ECHOES survey are assessed, certain themes/sub-themes are seen as common points in all LCs, including the perception of using renewable energy resources and their potential to benefit the environment, acceptance of energy policies protecting environment even when they induce higher costs, the potential of renewable energy resources to create new jobs, the personal obligation to support the energy transition, and feeling proud when other people save energy. The opinion that the use of more renewable energy resources will benefit the environment is strong among the respondents in the LCs. For instance, there is a 94.5% consensus among respondents from Izmir on this issue. Similarly, 80% of the respondents in Baku reported that they strongly agree with this statement and another 12% moderately agree while 66% strongly agree and another 25% moderately agree in Dublin. These rates are likely to vary in other LCs. To illustrate, in Milan, 32.4% declared that use of renewable energy resources will benefit the environment.

The energy policies that are likely to protect the environment might have additional costs. In this sense, the respondents were asked whether they would accept energy policies protecting the environment even when they induce higher costs. The rates among the respondents in different LCs vary. For instance, 91% of the respondents in Baku either strongly agree or agree with the statement that they would accept energy policies protecting the environment, despite their higher costs. Likewise, 70% declared that they support environmental-friendly energy policies in Dublin, and 83.6% in Izmir. This shows the higher levels of awareness regarding climate change and environmental protection in these cities regardless of high costs. In contrast, this rate slightly decreases among the respondents in Vilnius. Accordingly, less than half of the respondents agree or strongly agree to accept energy policies protecting the environment even if they have higher costs (i.e., around 44%), and more than 26% moderately or strongly disagree.

Another prominent aspect pertaining to energy behaviour/attitude is about the potential of renewable energy resources to create new jobs. The respondents from Greece, Dublin Austria excluding Vienna, Izmir, and Vilnius gave an answer to the relevant question. The results highlight that the highest rates among the respondents in all LCs belong to İzmir with 89.1% supporting the assumption that renewable energy creates new jobs. This can be related to the fact that energy transition in these cities is likely to influence the traditional jobs mainly in carbon intensive areas. Around 66% believe the use of more renewable energy resources might create new jobs in Dublin while 29% and other 4% neither agree nor disagree and either disagreed or strongly disagreed, respectively. This perspective in Dublin might be construed that although the respondents are less certain about the creation of new jobs than the benefits for the environment, the majority of them nevertheless agree that renewable energy resources have the potential to create new jobs. The same picture is also available in Austria excluding Vienna with nearly 57% of the respondents supporting this statement. However, the situation in Vilnius city is slightly different compared to other LCs. 41.2% of the respondents in Vilnius doubt that renewable energy resources might create new jobs since they neither disagree nor agree with the statement.

ECHOES survey makes evident that individuals demonstrate attitudes towards energy policies in different ways. These attitudes include individuals' personal obligation to support energy transition and their reactions when other people save energy. In this sense, 43% of the respondents in Lahti and 76% of the respondents in Greece feel obliged to support energy transition policies. These rates are even higher in Izmir with 89.1%. Moreover, 69% in Greece reported to accept such policies even if they bring increased cost. This shows that individuals' support for energy transition policies is promising. As for feeling proud when others save energy, it is seen that the majority of the respondents positively internalize the energy saving behaviour of other individuals in their environment.

Lifestyle choices are significant drivers of individuals' energy transition related behaviours. Mobility behaviour, individuals' housing behaviour, and personal attitudes and perceptions are addressed for multiple LCs in the ECHOES survey. As far as respondents' mobility behaviour is taken into account, the results demonstrate that the rates of using public transportation significantly differ in all LCs. For example, public transportation is moderately well accepted in Baku. 21% reported that they rarely use public transport on a weekly basis including travels to work or for shopping while 55% mostly use it. On the contrary, the majority of the respondents in other LCs rarely use public transportation mainly because of either perceived problems with the public transportation system in the city or personal habits. 44% rarely use public transport in Dafni and Skopelos, 29% in Dublin, 62% in Freistadt and Linz, and 53% in Vilnius. The use frequencies of public transportation also point in the same direction in Izmir. Only 7.3% of the respondents use public transportation for more than 12 trips per week in Izmir.

The perceptions and level of satisfaction regarding public transportation were tested in the surveys. The respondents in different LCs gave a variety of answers. Most of the respondents seem to be satisfied with the public transportation in their area. The level of satisfaction for public transportation is 56%, 42%, 56.3%, 50%, and 45% in Dublin, Austria excluding Vienna, Izmir, Lahti, and Vilnius, respectively. Furthermore, 17% of the respondents in Dublin agreed or strongly agreed that the public transportation system in their area is environmentally friendly, while 44% strongly disagreed or disagreed with the same statement. 40% of the respondents are uncertain. In Austria excluding Vienna, this rate is around 33% who (strongly) agree that the public transportation system in their area is environmentally friendly while 22% (strongly) disagree, which indicates certain challenges against increasing the use of public transport over motorized private transport. From the perspective of Vilnius city, none of the respondents strongly agreed that the public transportation in their area is environmentally friendly although the public transportation fleet and trolleybuses in Vilnius have been recently updated to a great extent. Rather, 35% (strongly) disagree with the statement. On the other end of the spectrum, the respondents in Greece do not seem to be satisfied with the public transportation in their area. The rate of the respondents that are very dissatisfied are 18% and dissatisfied 28% while only around 18% are satisfied and 3% very satisfied.

Types of public transportation vehicles used also have implications in terms of lifestyle choices of individuals. Accordingly, the bus is by far the type of public transportation that most people use in Dafni and Skopelos, Dublin, and Izmir. The frequent usage of busses in public transportation is followed by train, tram or metro in Austria excluding Vienna and Milan.

When individuals prefer private cars for travel instead of public transportation, the tendency for driving alone or car sharing dramatically influences the per passenger emissions of each car. 47% of respondents in Dublin drive alone very often or almost always, and another 16% half of the time. Only 17% almost never drive alone in their car. Similarly, 45% in Austria excluding Vienna drive alone very often or almost always. In Izmir, a majority of the respondents (66.7%) state that they drive alone in the car more than half of the time. 16.7% state that they almost always drive alone, and 21.4% state that they very often drive alone.

Majority of the respondents in LCs reported that they have not tried car sharing while a certain part of them might have an interest in trying. For example, 81% of the respondents in Dublin have never tried car-sharing, but a total of 42% of respondents expressed interest in the possibility. A further 3% of respondents have tried it but did not like car-sharing. The share of the respondents that have never tried car sharing is even higher in Austria excluding Vienna. Accordingly, 92% have never tried car sharing, but a total of 36% is interested in the possibility. On the other hand, the situation in Izmir is rather different. While a high percent of the respondents (72.7%) have not tried car sharing, 34.5% of the respondents indicate that they have not tried car sharing and not interested in car sharing either.

Another option to reduce emissions caused by private transportation is bicycle and electric bicycle (e-bicycle) purchase. In Dublin, 64% of the respondents almost never use their bicycle to go to work or to do shopping. This in turn means that only around 21% use their bicycle somewhat regularly for work and shopping, with 11% stating that they 'usually' use a bicycle for work and shopping all year long. In terms of willingness to purchase an e-bicycle, 21% (strongly) agree that they intend to purchase an electric bicycle within the next five years and 15% are undecided. 65% (strongly) disagree. 47% of respondents regularly use bicycles for work or shopping are Austria excluding Vienna. However, 78.2% of the respondents from Izmir state that they almost never use bicycles for work and shopping. Another 14.5% rarely, and 1.8% sometimes use bicycles for work and shopping. Nevertheless, 58.4% either strongly or moderately agree that they intend to purchase an electric bicycle within the next five years.

The ECHOES survey addresses individuals' behaviour in their home, to assess the lifestyle choices through heating method for houses, air conditioning (A/C) usage, the tendency of disconnecting electric appliances when not using them, and the felt personal obligation to be energy efficient. The respondents from the LCs use various heating methods in their houses such as central heating, natural gas, electricity, etc. A huge number of respondents in Baku (around 65%) use natural gas for heating their home, 22% use electricity, 11 % oil and just a few, 2% use wood. The LCs that utilize central heating for heating include Greece (54%), Dublin (71%), Austria excluding Vienna, Izmir (52.7%), and Vilnius (42%). In Lahti, the most common heating system is based on electricity (76%) with the support of wood in approximately 80% of the houses, and/or air source heat pumps in half of the houses.

The use of A/C differs in the LCs. The vast majority of the respondents does not have air conditioning at homes in Dublin (93%), Austria excluding Vienna (86%), and Vilnius (65%). 20% of the respondents from Izmir either have no air conditioner, or almost never use them. On the other hand, 26.6% use air conditioners regularly or often. However, the use of A/C is extended in Greece, primarily due to the warm weather especially during the summer, when electricity

consumption peaks in many areas. The frequent and regular use of A/C during summer accounts for 46% of the respondents.

One of the personal habits which could reduce energy consumption at home is disconnecting electric appliances (TV, PC, Notebook, DVD-Player, etc.) while not using them, thus cutting out standby consumption. High percentages of respondents are trying to disconnect their appliances. For instance, 29% of respondents from Vilnius often or always disconnect electric appliances when not in use. This rate is even higher in Dublin with approximately 49% reporting that they disconnect electric appliances when not in use while 26% do not frequently unplug appliances and 12% report never doing it. In Austria excluding Vienna, 43% often or always disconnect electric appliances when not in use. This means that 57% do not frequently unplug appliances including 19% that never do. When the respondents from Izmir are considered, 52.8% often or always disconnect electric appliances from the power supply when not using them, 10.9% occasionally do, and 36.3% never or rarely disconnect electric appliances from the power supply when not using them. However, the situation in Greece is totally different since the Greek respondents have no clear trend when it comes to disconnecting electric appliances while not using them.

The last common question in survey investigation pertaining to housing behaviour is the felt personal obligation to be energy efficient. The majority of the respondents indicated that they feel a strong obligation to save energy in Baku (58,6%), Izmir (94.5%), Lahti (42%), Vilnius (73%) through for example using public transport instead of a personal car, turning off lights when leaving the room, or using technical appliances which help to save energy.

Personal attitudes and perceptions shape individuals' lifestyle choices. Hence, ECHOES survey collected data pertaining to these themes. The common aspects addressed in LCs include individuals' possibility to take personal actions to support the energy transition and the impact of being a part of a community to achieve collective action. Accordingly, the respondents either agree or strongly agree that each individual can do much to support the energy transition in Dublin (69%), Austria excluding Vienna (55%), Izmir (85.4%), and Vilnius (39%). Compared to other cities, the rate is relatively lower only in Vilnius city. On the other hand, some of the respondents believe that community actions are more successful to achieve the energy transition. The results show that 79% of the respondents in Dublin, 72% in Austria excluding Vienna, and 58% in Vilnius either agree or strongly agree that people can act together to achieve the energy transition. However, a much lower 5.5% in Izmir strongly agree that people can act together to achieve energy transition, and 38.2% moderately agree with this statement, summing to a 43.7% who agree. 18.2% of the respondents neither agree nor disagree, and 38.2% either strongly or moderately disagree.

5.1.3 Assessment of low and high GHG behaviours based on ECHOES Survey

Policy acceptance can be perceived as one of the individual behaviours for low GHG emissions. Below is a mapping of LCs with policy acceptance levels of respondents (see Figure M4).

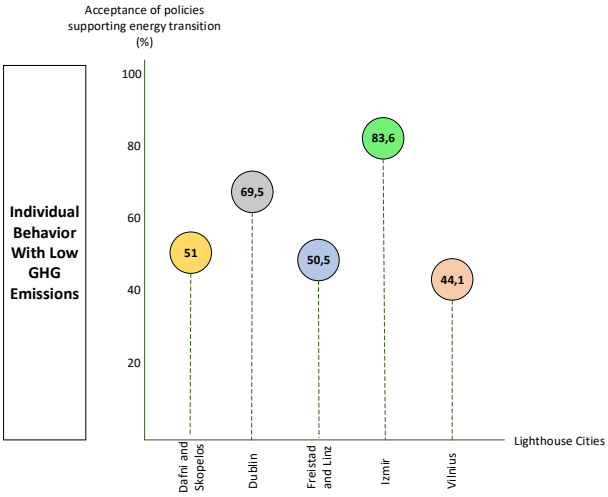


Figure M4: Acceptance of policies supporting energy transition

Based on the preceding assessment, the frequency of public transportation usage varies in different countries and Lighthouse Cities. As an illustration, Figure M5 presents the highest levels of public transportation usage. It is worthwhile noting that the ECHOES survey was conducted in the pre-Covid-19 period, and the results regarding public transportation might be affected by the Covid-19 pandemic.

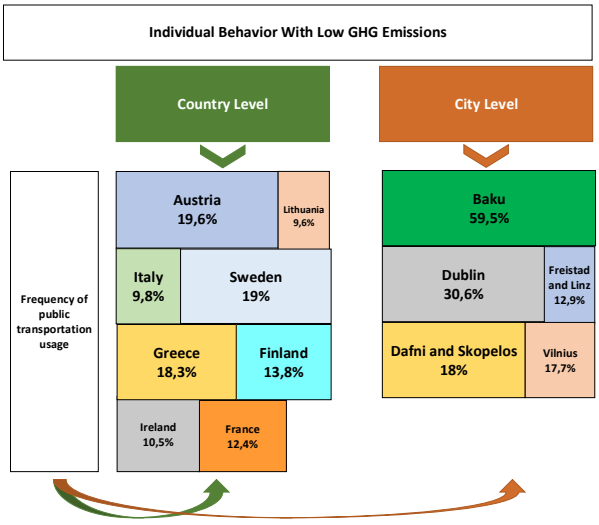


Figure M5: Highest frequency of public transportation usage

One of the key indicators of behaviours with high GHG emissions is habits of driving alone. Below, the levels of driving alone are presented on the country and the city levels (see Figure M6).

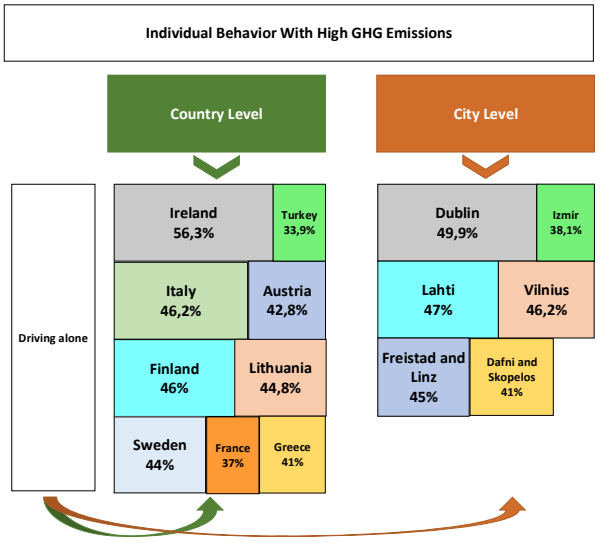


Figure M6: Driving alone

Contrary to an individual behaviour that causes higher GHG emission levels, which is driving alone, car sharing might be accepted as a potential to reduce GHG emission levels. Hence, Figure M7 shows the rate of the respondents that have an experience in car sharing and support it in relevant countries and LCs.

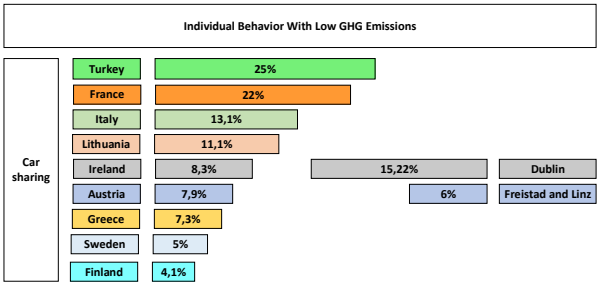


Figure M7: Car sharing

Another significant factor that contributes to the reduction of individual-led GHG emissions is the bicycle use. The results show that individuals use their bicycles for their daily trips at varying degrees. However, the number of the individuals

that regularly use bicycles for travel is still limited in the relevant countries, as highlighted in Figure M8.

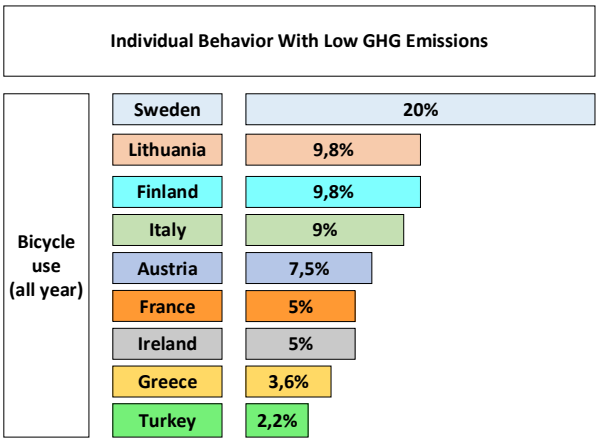


Figure M8: Regular bicycle use

Last but not least, driving with private cars for longer distances is a significant part of mobility behaviour that leads to higher GHG emission levels. Driving more than 30.000 kilometres per year is likely to further increase the individual-led GHG emissions. The analysed data shows that respective countries and Lighthouse Cities have varying degrees for driving more than 30.000 kilometres per year, as illustrated in Figure M9.

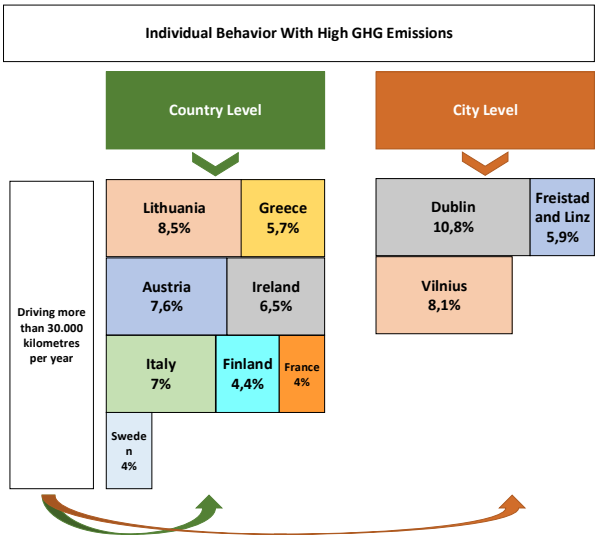


Figure M9: Driving more than 30.000 kilometres per year

Supplying electricity from a RES provider is a significant determinant for reducing GHG emissions. Figure M10 demonstrates the share of the respondents that supply electricity from a RES provider in country level and city level.

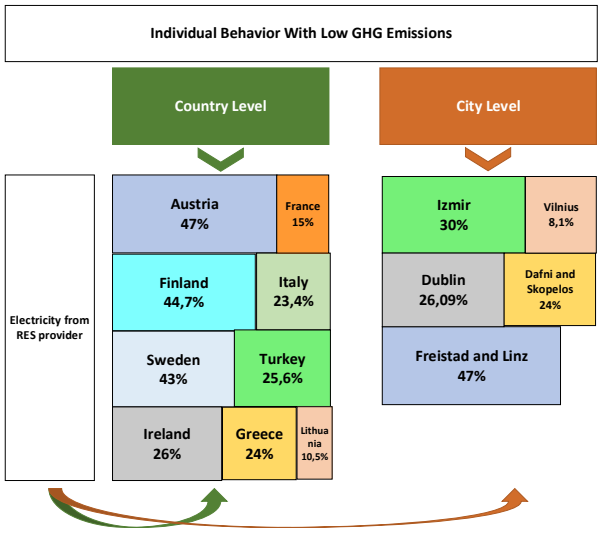


Figure M10: Electricity from a RES provider

5.2 Carbon-emitting behaviours, key factors, motivators, and barriers for climate-friendly lifestyles

The factors affecting support for climate policies and tendency to adopt pro-environmental behaviour and climate-friendly lifestyles are analysed through three main approaches, namely, internalist, externalist, and integrative approaches (Jackson, 2005). The first approach is

the internalist approach that connects the adoption of climate-friendly lifestyles mainly to the individual's internal characteristics and motivators. These include the habits, beliefs, values, and emotions of the individual that define their attitudes (Stern et al., 1999). The internalist approach is criticized due to its limitations in terms of incorporating the effects of social factors, economic and financial factors, and institutional parameters. The social factors pertain to those related with the community, social networks, and trust. Economic and financial factors include the income levels and the costs associated with policies such as carbon taxes. Finally, the institutional parameters refer to the structure of the building stock or availability of public transportation infrastructure, building design (Rhodes et al., 2017). The second approach is the externalist approach, which associates climate policy support and the adoption of climate-friendly lifestyles to economic, political, and cultural aspects, without emphasizing internal factors (Leiserowitz, 2006).

The third approach aims to provide a more comprehensive framework through a synthesis of the internalist perspective and the externalist perspective. This approach is called the integrative approach (Stern, 2000). An example of the integrative framework is the ABC (Attitude-Behaviour-Context) model, that suggest three categories to explain the individuals' pro-environmental behaviour and the adoption of climate-friendly lifestyles (Rhodes et al., 2017).

These categories are the attitudinal parameters that are based on the values of the individual and their concerns on the environmental issues and climate change (Tobler et al., 2012), contextual parameters that refer to the economic, political, and social aspects, and finally personal capability, that relates to socio-demographic aspects (Hao et al., 2020).

Globally, policies to tackle climate change are among the main tools for governments in terms of mitigating the adverse effects of carbon emissions (IPCC, 2018). The extent to which the policies result in the desired outcomes depends on a number of parameters and factors. One such parameter is the public response, referring to if and how individuals change their carbon-emitting behaviours as implied by climate policies, and what co-benefits, motivators, and barriers are effective in policy acceptance and adoption of climate-friendly lifestyles (Steg, 2018). Results of the ECHOES survey also reveal that individuals' behaviours and energy-related decisions are related with their intent to decrease their energy uses and their perception of individual responsibility to contribute to climate change mitigation.

5.2.1 Co-benefits

Individuals' adoption of climate-friendly lifestyles is an indispensable prerequisite for the achievement of the environment-related and climate-related targets (Koirala et al., 2018). Accordingly, the analysis of individual behaviour and choices, along with the factors affecting them is crucial in terms of designing strategies and policies for the adoption of lifestyles. In this respect, the ECHOES survey is a comprehensive survey that collects the perceptions and preferences of individuals and provides significant results.

A number of co-benefits of climate action that directly impact individuals are identified as benefits of climate action are identified as job creation, improved public health, improved resource quality (e.g., air, water), improved resource efficiency (including food, water or energy), resource security, and social community and labour improvements (Bachra et al., 2020). Other co-benefits are identified as a shift to more sustainable behaviours, greening the economy,

enhanced resilience, and enhanced climate change adaptation (Bachra et al., 2020).

The positive relationship of the individuals with their communities, particularly those that are defined with high levels of trust to their communities also act as motivators for their pro-environmental behaviour and policy support.

Along with lifestyle choices, individuals affect carbon emissions in several ways (Stern, 2000). The first such means corresponds to consumer choices. Individuals as households consume energy at their homes, via their vehicles, and indirectly through their purchases of goods and services, and dietary habits. The indirect effects of individuals in carbon emissions also relate to the ways through which individuals as citizens contribute to public opinion, support or opposition regarding climate policies, or initiatives to adopt climate-friendly lifestyles, and voting in elections. Within their community, individuals are likely to share their ideas on environmental issues and climate change, which may further increase the extent of individuals' role in impacting carbon emissions (Vainio et al., 2020).

These lifestyle choices and behaviours of individuals are based on a wide spectrum of factors including general convenience for the individual, economic and financial factors, the legislative environment, technologies, socio demographic factors, national and local constructs, and infrastructures (Rouvinen and Matero, 2013). The impacts of national and local factors vary from country to country (Heiskanen and Matschoss, 2017). Section 4 and Section 5 of this deliverable provide a detailed analysis of such country level and city level differences.

Public response, as a driver of the adoption of climate-friendly lifestyles, is affected by the characteristics of citizens on various levels. The first level corresponds to the individual characteristics, the second corresponds to community or society relevant characteristics, and the third level refers to country-related characteristics (Hornsey et al., 2016; Marquart-Pyatt et al., 2019).

Among the individual level characteristics impacting public response and adoption of climate-friendly lifestyles, the foremost factors are socio-demographic factors, political perspective, awareness and attitude towards environmental issues, and an individual's acceptance of climate change and its primary cause (Lewis et al., 2019; Poortinga et al., 2019; Tranter and Booth., 2015). The ECHOES survey also questions the individuals' perspectives on these factors as determinants of public response and adoption of climate-friendly lifestyles.

Co-benefits and community attachment are valuable composite indicators that can be analysed as a representative for a collection of community or society relevant characteristics. In this respect, results from the ECHOES survey regarding community attachment provides valuable results in terms of the effect of co-benefits and community attachment, that are in line with evidence from the literature.

The underlying social connections for community attachment can be in the form of formal or informal connections. The formal connections are those referring to being members of formal constructs such as professional, political, religious, or educational organizations. On the other hand, the connections with one's family, relatives, friends, and family are examples of informal social connections. In the literature, the community attachment has been modelled by social capital, which refers to "the links, shared values, and understandings in society that enable individuals and groups to trust each other and so work together" (OECD, 2021). Through fostering cohesive collective initiatives and action,

community attachment and social capital have the potential to act as an enabler in alleviating the adverse effects of climate change through collective community action, also mobilizing individuals who would otherwise remain outside climate change response. Moreover, collective action and co-benefits also serve for addressing the unfair distribution of costs associated with carbon emissions as well as of the benefits and unjust distribution of the costs of carbon emissions, costs of climate change mitigation efforts, and similarly, the benefits of reducing the impacts of carbon emissions and climate change (Hao et al., 2019; Liu et al., 2019).

Earlier studies in the literature stress the relationship between individuals' policy support and concerning climate-related policies and individuals' attachment to their society, formal and informal social networks. Higher levels of social capital are highly correlated with higher tendency to support climate policies and higher tendency to adopt climate-friendly lifestyles (hao et al., 2020). The attachment to a community is demonstrated in various forms, by the strength of the connections of the individual with their neighbours, friends, family, or colleagues, which enhances the sharing of information and concerns on climate change, leading to higher sensitivity to such issues and stimulating collective action. This attachment to community, termed as social capital, is also impacted by the level of trust within the community (Hao et al., 2020). Individuals who are members of formal or informal social networks with stronger trust relationships are more likely to be involved in collective initiatives or individual pro-environmental behaviours, support climate policies and adopt climate-friendly lifestyles (Bai and Liu, 2013).

5.2.2Key factors, Motivators and Barriers

The individuals in a community share values. This is also reflected in terms of how they receive, evaluate, and process information, including information on environmental issues and climate change. That is people in a community are affected by one another, for instance, in terms of concerns and behaviours about climate change (Hao et al., 2020). The ECHOES survey investigates this phenomenon through questions regarding the individual's perception of their community in terms of saving energy, supporting policies, changing lifestyles, purchasing electric bicycles, as well as through questions regarding the individual's community attachment.

This applies, however, to support as well as scepticism on the related issues, hence, to motivators as well as barriers regarding the adoption of climate-friendly lifestyles. This phenomenon is further strengthened when some higher and more concrete form of risk perception is present. For instance, in countries with higher visible effects of climate change (such as increasing temperatures, more frequent extreme weather events), people with higher attachment to their community, family, relatives, neighbours are more likely to assess a higher risk perception and more likely to adopt climate-friendly lifestyles and pro-environmental behaviour, in order to reduce such risk for themselves, as well as their community (Hao et al., 2019; Macias and Williams, 2016). In such cases, higher risk perception regarding the effects of climate change acts as a motivator for pro-environmental behaviour and adapting climate-friendly lifestyles.

Hence, community attachment and social capital are effective motivators in fostering pro-environmental behaviour and relevant lifestyle choices, thereby induce higher levels of support

for the adoption of climate friendly-lifestyles and climate policies. Moreover, such connections are likely to increase the efficiency of community initiatives. One of the key determinants of the level at which social capital acts as a determinant of pro-environmental behaviour is how much the individual trusts others in the community (Hao et al., 2020). In this respect, trust is important from two main perspectives. First, an individual's trust in the community impacts how much effort the individual would be willing to spend for the greater good of the community. Second, trust in the community also reflects on the perceived efficiency of collective action including adoption of climate-friendly lifestyles and supporting climate policies (Fairbrother, 2016; Irwin, 2019). Therefore, within the context of climate-friendly lifestyles, it may be argued that the strength of the social network and the level of trust can be exploited in order to assess community attachment or social capital. The ECHOES survey analyses this aspect by relevant questions and identifies results that are consistent with the findings from the literature.

Another factor that is critical in terms of the adoption of climate-friendly lifestyles pertains to the concerns of individuals regarding the future, and the reflections of their daily life choices and behaviours on the future. Evidence from the literature suggests that households are more inclined towards prioritizing immediate effects over long-term future considerations, thus, posing a barrier for the adoption of climate-friendly lifestyles (Shove et al., 2012; Vainio et al., 2020).

Prioritizing concerns about the future effects and outcomes of one's behaviours over immediate costs and considerations is an indicator for pro-environmental behaviour (Arnocky et al., 2013; Rabinovich et al., 2010), and can be identified as a motivator, which is also effective in terms of overcoming the barrier of attitude-behaviour gap.

Among the contextual parameters, the economic aspects are mainly directly associated with the lifestyle choices of individuals. These include private vehicle use, habits associated with use of public transportation, type of dwelling, and type of heating-cooling. These economic aspects might be affected by the visibility of environmental issues and the effects of climate change (e.g., increasing frequencies of extreme meteorological events or visible air pollution), as well as by the self-serving bias. Visibility is also effective in terms of the tangible negative or positive effects of policies such as carbon taxes or subsidies for renewable energy (Chetty et al., 2009). Accordingly, the economic aspects may pose barriers or motivators regarding the adoption of climate-friendly lifestyles (Shwom et al., 2010).

Regarding the personal capability related motivators, certain socio-demographic characteristics are expected to induce higher support for climate policies and higher tendency to adopt climate-friendly lifestyles. The parameters associated with the individuals' location are also effective in this sense. For instance, citizens of countries or regions with high carbon dependency tend to show less support towards climate policies as indicated also by the results of the ECHOES survey (Matisoff and Edwards, 2014).

One barrier regarding the adoption of climate-friendly lifestyles is the discrepancy between the stated perceptions of individuals in terms of climate-related issues and their actual choices and carbon-emitting behaviours. This phenomenon is called the attitude-behaviour gap (Brown and Sovacool, 2018). In terms of overcoming the barrier associated with the discrepancy of attitude towards environment and pro-environmental behaviour, the moderating

effect of enablers (motivators) may be helpful. An example would be utilizing the moderating effect of self-efficacy where the individuals demonstrate a positive attitude regarding energy conservation in order to trigger the behaviour for decreasing the energy use of households. Likewise, attitudes towards environment are strengthened by environmental awareness and knowledge as moderators, and vice versa (Bamberg, 2003). Alongside its impact as a mediator for individuals' attitude and their behaviours, self-efficacy is also demonstrated to be a motivator for pro-environmental behaviour (Tabernero and Hernandez, 2011). Moreover, environmental and climate-related concerns are also correlated with social capital (Vainio et al., 2020)

National level characteristics are closely related to, and in some cases also perceived as a subset of collective level characteristics associated with public acceptance of climate policies and adoption of climate-friendly lifestyles (Hao et al., 2020). In this respect, two significant facets of national level characteristics are defined by the economic and environment-related parameters.

The economic indicators including the income levels, industrial production, and consumer price index affect the lifestyle choices, carbon emitting habits, behaviours, and decisions of individuals. One specific national-level characteristic, national carbon dependency, pertains to how much the economy of the country is dependent on the fossil fuel industry. One way to measure carbon dependency is to measure how much carbon emissions is needed to produce one unit of GDP (Gross Domestic Product) that is, carbon dependency of a country can be computed by dividing the total carbon emissions of the country to the country's GDP (Hao et al., 2020).

It is expected that the higher carbon dependency of a country or a region, the less the citizens of the country or the region demonstrate concerns regarding carbon emissions and climate change, since many jobs and incomes of individuals are dependent on the fossil fuel industry and cutting down on this industry in favour of climate-friendly lifestyles might have negative effects on the local economy. This, in turn, might pose a barrier regarding the adoption of climate-friendly lifestyles and support for climate policies owing to their additional costs (Freudenburg and Davidson, 2007).

The evidence from the literature suggests that individuals that work for the fossil fuel industry are more unlikely to support pro-environmental policies, especially if they induce additional costs on the industry. Moreover, the joint effects of carbon dependence with psychological, cultural, and social factors and the (mis)information spread by the industry may significantly keep individuals from engaging in choices, behaviours or activities associated with climate-friendly lifestyles (Hao et al., 2020). In such situations the awareness of individuals concerning environmental issues is lower, there is a much weaker perception of climate change risks, and more people tend to believe that global warming is not happening, and even so, it is not primarily caused by human activities (Brulle, 2019).

Therefore, countries or regions that have higher rates of carbon dependency are less likely to support climate action and adopt climate-friendly lifestyles. It becomes even more challenging to implement climate or energy policies that bring additional costs such as carbon taxes (Harring et al., 2019). One resolution at this point is brought about by policies that, at the same time, create new jobs, as evidenced by the ECHOES survey.

Another barrier is climate vulnerability. In terms of environment related factors, the level at which the particular country is prone to the effects of

climate change or actually suffers from the effects of climate change impacts the awareness and sensitivity of individuals in terms of their response to climate. This phenomenon of "the propensity or predisposition to be adversely affected (by climate change) is termed as climate vulnerability (IPCC, 2018).

Although the phenomenon of climate vulnerability is intuitive, there is no direct measure associated with the parameter. More importantly, since the impacts of climate change are not always visible, the public perception and awareness of climate vulnerability is usually low. That is, climate vulnerability is not very likely to trigger the adoption of climate-friendly lifestyles. One measure of climate vulnerability utilizes tangible parameters such as the total loss associated with extreme climate events. The total loss is quantified through the number of casualties and a monetary estimate of economic losses (Knight, 2018; Tranter and Booth, 2015).

Within Europe, the Mediterranean Basin, Southern Europe, Far Northern Europe and the Arctic Region, as well as the mountainous areas of Europe, coastal areas, deltas and floodplains are especially vulnerable to climate change (European Environment Agency, 2020).

As well as with the type of the policies based on whether they are compulsory, regulatory, or non-compulsory and the individual characteristics, climate policy response, the tendency to support climate policies and adopt climate-friendly lifestyles are also impacted by which particular groups of individuals benefit from or incur costs because of these policies. For instance, compulsory policies like carbon taxes receive much lower support from and tend to attract solid resistance from carbon-intensive industries (Chetty et al., 2009)

This is associated with the phenomenon of self-serving bias, referring to individuals or impact groups having a higher tendency to accept and support concepts and notions which they associate with benefits or positive prospective outcomes to themselves as individuals or as a group (Cristofaro and Giardino, 2020). The self-serving bias can act both as a motivator and barrier for the adoption of climate-friendly lifestyles, such as acting as a motivator in the case where renewable energy investments create new jobs, and a barrier where the particular investment causes losses of jobs in the fossil fuel industry. For the case where the Typical examples arise where the more elite groups with social, economic, and political power advocate or hinder policies according to their benefits, or where vulnerable groups who are the first to face the costs of policies may resist to climate policies. This, in turn, induces inconsistencies in terms of the public good, public response, and policymaker perspectives (Caplan, 2007)

As evidenced also by the results of the ECHOES survey, carbon-emitting behaviours of individuals are closely correlated to energy consumption as households. Evidence for such behaviour and habits are generally collected through choices of individuals including recycling habits (Barr, 2007), their use of public transportation or individual vehicles for daily commutes, choosing airplane or other modes for long distance, or choosing to buy green products.

Awareness about environmental issues, carbon-emitting behaviours, and the impacts of climate change is a prerequisite for the adoption of climate-friendly lifestyles (Abdul-Wahab, 2010).

Knowledge about the significance of low-carbon lifestyles is also demonstrated to be a motivator for energy conservation and similar low-carbon behaviour (Kaplowitz et al., 2012; Wright et al., 2008). Similarly, lack of awareness and lack of

information on these issues acts as a barrier against climate-friendly lifestyles. Moreover, even though the individual has a positive attitude about environmental issues, the lack of information on what the person can do as an individual, or with the community, including the skill set required, is also a barrier for pro-environmental behaviour. Accordingly, information provision is also a motivator in this sense.

Other potential barriers are inconvenience for the individual, perceived constraints about time availability for pro-environmental activities (Niemeyer, 2010), perceived or actual insufficiency in terms of technical or social capability (Stern, 2000), lack of trust or information about potential, economic barriers such as the investment costs for renewable energy systems and high breakeven times (Ozaki and Sevastyanova, 2011).

On the other hand, the motivators are determined as climate policies (Stern, 2000), attachment to community, social norms, and social capital, the impact and values related to culture, incentives and subsidies (McMakin et al., 2002), cost of energy and cost of inefficient use of energy (Kannan and Boie, 2003)

Policymaking efforts typically focus on overcoming or reducing the effects of barriers and boosting or increasing the impacts of motivators. The prevalence and effects of barriers need to be considered in designing policies and prioritizing the barriers to address. The perceived or actual insufficiency in terms of technical or social capability and lack of trust or information about potential partners including the society are underlined as more frequently observed barriers.

5.3 Policy Suggestions

Climate policies typically target a range of actions or initiatives for reducing carbon emissions. These policies are implemented by different governmental levels, including local, regional, or national levels. They may also be the transposition of international agreements such as the Paris Climate Pact or the transposition of EU legislation into national legislation. The scope of climate policies covers a wide range including subsidies and incentives, carbon taxing to reduce carbon emissions, regulations to decrease the emissions of methane in agriculture, regulations on fuel efficiency, information provision and education programs for protecting water supplies and coastal settlements, programs for promoting climate action, and various schemes to support the deployment of renewable energy.

One category of climate policies utilizes the government's authority to prohibit, penalize, or oblige a set of actions in order to reach the policy goals. Such policies are termed as compulsory policies. Concerning climate policies, compulsory policies typically involve measures to prevent or limit carbon emitting behaviours. These include restrictions on the fuel technologies to be used, penalizing carbon emissions with additional costs, aiming that industries, individuals, and households to adopt climate-friendly lifestyles and, eventually, reduce their carbon emissions (Jaccard, 2006).

Another type of climate-related policies involves regulatory policies. Regulatory policies provide the standards and requirements relevant to carbon emissions that should be followed by the associated actors in these areas. Examples of such standards and requirements are the

regulations on vehicle efficiencies, standards for buildings efficiency, and standards for the electricity market, for instance, concerning the use of renewables in the electricity generation mix.

The policies that involve carbon taxing and emission allowances (emission caps) aim to reduce carbon emissions by considerably increasing the associated cost. The emission cap policy of the European Union induces a limit on the greenhouse gas emissions produced by the industries in the scope of the EU Emissions Trading System (EU ETS), that is, power plants, industry factories and the aviation sector. Companies in these fields can trade emission allowances, provided that the overall volume does not exceed the limit defined by the EU ETS. This limit is reduced every year, so as to ensure that the overall emissions from these sectors decrease as targeted (European Commission, 2021).

Such policies do not prohibit or suggest specific modes of action. However, since they significantly increase the costs of carbon emissions, the individuals and industries have to choose between either to pay the charges for their emissions in the form of unit carbon price -if they are within their designated capacity limit- or trade price -if they purchase emission cap- or seek for ways to decrease their carbon emissions for cost reduction (Goulder and Parry, 2008) among other motivators. Such efforts mainly involve investments in technology for GHG emissions reduction. At this point, the EU ETS mechanism acts as a motivator.

In addition to compulsory policies and regulations, other types of climate policies target to achieve the reduction of carbon emissions through behavioural change and the adoption of climate-friendly lifestyles. These non-compulsory climate policies involving information provision and subsidies, do not include negative outcomes for carbon emitting behaviour, and rather rely on the principle of voluntary participation of individuals for decreasing their carbon emissions or breaking their carbon emitting habits. The foremost types of non-compulsory policies incentives and subsidies for renewable energy technologies, direct investments by the government, education programs, information provision, and awareness increasing campaigns and interventions.

Research on climate policies suggest that the public support for compulsory policies, carbon taxes, emission allowance, or increasing the electricity prices type policies is usually limited. On the other hand, non-compulsory policies that target behaviour change and regulatory policies such as standards for renewable portfolio, subsidies on sustainable buildings and low-emission heating systems, subsidies on renewable energy technologies and electricity generation from renewable sources obtain higher public support (Drews and van den Bergh, 2015; Lachapelle et al., 2014).

Concerning the types of policies, non-compulsory policies and regulatory policies that focus on supply regulations obtain the highest levels of support. The lowest policy acceptance and the highest resistance is associated with policies that target the energy market, such as carbon taxes and emission trade systems (Lachapelle et al., 2014).

Policies that target the adoption of climate-friendly lifestyles focus more on the alleviation of structural barriers associated with climate change mitigation. However, these need also to consider socio-psychological factors, in order to overcome the discrepancy between individuals' attitudes, stated perceptions, and their pro-environmental behaviours. Such efforts will also contribute to a more realistic design, targeting, and evaluation of impacts of policies.

Another focal point is the significance of formulating climate policies that address individuals' behavioural change rather than implementing compulsory or regulatory policies. At this point, the mediating effects of information provision and enhancing pro-environmental attitude are areas that can be exploited. Hence, policies such as those involving campaigns targeting to increase the awareness and information of individuals and their abilities to participate in climate-friendly lifestyle adoption would serve well in this respect. Similarly, policies regarding the informing citizens about the alternatives for pro-environmental behaviour and creating more alternatives for citizen participation are also more efficient in triggering the adoption of carbon-friendly lifestyles. To this end, policies also need to consider the funds required for areas such as establishing and incentivizing the renewable energy infrastructure, recycling, reuse systems, and campaigns for promoting the adoption of climate-friendly lifestyles.

However, it is also worthwhile noting that pro-environmental attitude does not directly translate into pro-environmental behaviour or the adoption of climate-friendly lifestyles. The contextual, barriers and/or motivators may affect the attitude negatively or positively.

Participation of individuals in pro-environmental behaviour and activities related to adoption of climate-friendly lifestyles is important in terms of policymaking from two complementary perspectives. First, the success of policies is dependent on to what extent they enhance and trigger public activities and pro-environmental behaviour. The ultimate targeted achievement of climate policies needs to involve pro-environmental behaviour, beyond developing attitude. Hence, the policies also need to introduce pro-environmental actions for the adoption of climate-friendly lifestyles.

One factor that can be exploited for policies to facilitate climate-friendly lifestyles is social capital. Acting together with the communities can provide a leverage for the individuals in developing pro-environmental behaviour and adopting climate-friendly lifestyles, and a higher pressure against carbon-emitting behaviours. The power of social influence and social norms is even higher when the policy tools such as subsidies and incentives are implemented. Therefore, climate policies that combine subsidies and incentives with actions to enhance community attachment, or in settings where community attachment is high, have better chances of success.

Overcoming the effects of carbon dependency as a barrier for the adoption of climate-friendly lifestyles and public support for climate policy, is a long-term effort. Progress in this direction can be achieved by decreasing the level of dependency on the fossil fuel industry, which calls for structural changes, such as the transformation of electricity production technologies to be more renewables-oriented. Within this context, policies that would incorporate the joint implementation of incentives and subsidies for low-carbon industrial implementations, information provision and education regarding the economic advantages of renewables, low-carbon industries and climate-friendly lifestyles are deemed effective.

Individual characteristics play a significant role in the terms of policy acceptance, hence the efficiency of climate policies. Differences in values, habits, perceptions, personal norms, attachment to community, socio-demographic parameters, and other contextual characteristics of individuals may alter their attitude towards climate policies.

The factors that act as persistent parameters in terms of inducing support for climate policies are determined as individuals' concerns on the

adverse effects of climate change, distrust in the fossil fuel industry, trust in academics and academic output, and being female (Dietz et al., 2007; Zahran et al., 2006).

Policy making for climate change mitigation and reducing carbon emissions characteristics of individuals need to be taken into account, in order to formulate and implement targeted policies that will receive community support and trigger climate-friendly behaviour and lifestyles. On the other hand, resistance against policies needs also be considered. High support-low resistance does not necessarily imply the achievement of the results targeted by the policy. The level of resistance, its nature and causes need to be considered in policymaking. As much as the perceptions of individuals are significant in terms of climate policies, these perceptions are impacted by a wide spectrum of factors including social capital and climate vulnerability. Hence, such factors also need to be evaluated to provide inputs to formulation of policies.

6. Conclusion

The ECHOES survey and similar existing data for partner countries/cities that the ECHOES survey does not cover Baku (Azerbaijan), Trujillo (Peru), and Cape Town (South Africa), provide valuable information concerning the lifestyles, lifestyle choices, and behaviours of citizens in the partner countries and respective Lighthouse Cities.

Analysis of the findings from the ECHOES survey and similar existing data, as well as the analysis of the relevant literature provides significant results and pointers to the relationship between the characteristics and living conditions of citizens and their carbon emitting behaviours. Within the context of CAMPAIGNers, these results are utilized in order to derive and implement targeted and impactful policies as well as for identifying the possible co-benefits of climate-friendly lifestyle choices and behaviours. Through these results, the potential adverse effects of unintended consequences regarding such choices and behaviours for vulnerable groups can be identified and avoided.

This deliverable report provides the country level and city level analysis, a country level comparison of results, a city level comparison of results, and the comparison of country-level and city-level results. The city and country level analysis also include interim conclusions and policy suggestions for the particular countries and cities.

These results are then matched with the findings from the literature to provide a more unified perspective regarding the relationship between the characteristics of citizens and their carbon emitting behaviours, demographic, cultural, socioeconomic, or other types of features that can be used as ingredients in designing climate policies and relevant actions. The analysis is also utilized to reveal potential motivators and barriers that can further be exploited to identify drivers for behavioural change towards achieving low-carbon lifestyles.

Through the demands of individuals as customers, and processes that are employed in order to fulfil this demand, individuals' behaviours and choices directly and indirectly affect carbon emissions. One significant goal of climate change mitigation policies is to influence individuals' decisions and behaviours in a way to adopt climate-friendly lifestyles and decrease carbon emissions.

Due to its carbon intensity, the current global economic growth is not sustainable. Hence,

countries need to design their growth strategies and policies through low-carbon action plans. However, it is not straightforward to fulfil this endeavour through the use of technological development, safeguarding sufficient funds, or constructing the necessary infrastructure. The success of climate policies is highly dependent on the citizens, and a comprehensive understanding of the carbon-emitting behaviours of individuals, their awareness, and pathways to adopt climate-friendly lifestyles.

As with many areas of policymaking, success of the European climate policies is also dependent on the public support and to what extent the public opinion is incorporated within the policy formulation stages.

The public opinion is affected by many factors, including, clearly, own benefits of the individuals. In cases where the actions involved or the targeted policies conflict with the benefits of the individuals, such as in the cases with additional costs or additional restrictions, support of the public for the policies will be weaker. Other negative effects would be expected where policies that foster the uptake of renewables eventually result in job losses for the fossil fuel industry and imply economic losses for people who work for the fossil fuel industry and their families.

Although this does not imply that people will start acting against climate policies, it is very likely that they will be affected by the narratives and information circulated by the fossil fuel industry and have a lower tendency to develop pro-environmental behaviour or adopt climate friendly lifestyles, in favour of preventing the economic losses for the victims of, for instance, renewables, who work for the fossil fuel industry and connected industries.

As a final remark, the ECHOEs survey provides results based on the perceptions and responses of the interviewees and does not include empirical evidence through the observation of the behaviours of individuals. Therefore, the results may include a bias associated with what the respondents aspire, rather than what is really occurring.

7. References

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8. Appendix – ECHOES Survey Questions by themes

Table 8.1: Demographics Questions

Question number	Question
Q0	Which country sample is this respondent a part of?
Q1	How old are you?
Q2	Please indicate your gender
Q3	Which of the following best describes you?
Q4	Which of the following best describes where you live?
Q5	For approximately how many years have you been living at your current address?
Q6	Please provide your postal code (ZIP code)
Q7	Which nationality were you born with?
Q8	How many people currently live in your household, including yourself?
Q9	How many children do you have?
Q10	How many of your children are under the age of 14?
Q11	Which of the following is your highest level of education?
Q12	Where would you place yourself on this ladder?
Q13	How would you describe your political outlook with regard to economic issues (e.g., taxes, cooperative vs. protective foreign economic policy, etc.)?
Q14	How would you describe your political outlook with regard to social issues (e.g., family, religion, traditional values, etc.)?
Q15	Median monthly net income of the country the respondent belongs to

Table 8.2: Climate Change Related Questions

Question number	Question
Q33	Most scientists say that the world's temperature has slowly been rising over the past 100 years. Do you think this has been happening?
Q34	Assuming that the world's temperature is rising, do you think this is caused mostly by natural causes, about equally by natural causes and human activity, or mostly by human activity?
Q114	Would you like to donate some of your compensation to myclimate.org to help fight climate change ?

Table 8.3: Energy behaviour/attitude related questions

Question number	Question
Q28	I feel guilty if other people do not save energy
Q29	I feel proud if other people save energy
Q30	I am angry about the fact that many people in do not save energy
Q31	The use of more renewable energy sources will benefit the environment
Q32	The use of more renewable energy sources will create new jobs in (*my community*)
Q36	Many people in (*my community*) would support it if I used less energy e.g., using public transport instead of a personal car, turning off lights when leaving the room, using technical appliances which help to save energy
Q37	Many people would support it if I favored energy policies that support the energy transition e.g., policies that increase the prices of fossil fuels
Q38	A growing number of people try to save energy (e.g., using public transport instead of a personal car, turning off lights when leaving the room, using technical appliances which help to save energy)
Q39	A growing number of people favor energy policies that support the energy transition
Q54	I feel a personal obligation to support energy policies that support the energy transition
Q63	I intend to use energy in a way that helps bringing the transition to a renewable energy system
Q64	I would accept energy policies that protect the environment even when these induce higher costs (e.g., policies that increase the prices of fossil fuels)
Q65	I would accept energy policies that protect the environment even when these induce some loss in comfort (e.g., policies that restrict car traffic in cities)
Q66	I would accept energy policies that create new jobs in (*my community*) even when these induce higher costs (e.g., policies that increase the prices of fossil fuels)
Q67	I would accept energy policies that create new jobs in (*my community*) even when these induce some loss in comfort (e.g., policies that restrict car traffic in cities)

Table 8.4: Lifestyle related questions

Question number	Question
Q18	How satisfied are you with the current public transportation system in your area?
Q19	I consider the public transportation system in my area to be environmentally friendly
Q20	How many trips do you take per week using public transportation on average? By "trip" we mean one instance of travel from one place to

	another. Traveling to and from work would be two trips
Q22	I control my emotions by not expressing them
Q23	I control my emotions by changing the way I think about the situation I am in
Q24	I consider how things might be in the future, and try to influence those things with my day to day behaviour
Q25	I think it is important to take warnings about negative outcomes seriously even if the negative outcome will not occur for many years
Q26	It is easy for me to concentrate on what I am doing
Q27	I am able to pay close attention to one thing for a long period of time
Q35	How much do you see yourself as a citizen of (*country*)
Q40	Many people would support me decreasing my energy consumption for heating and cooling my dwelling
Q41	A growing number of have decreased their energy consumption for heating and cooling their dwelling
Q42	Many people in would support me purchasing an electric bicycle
Q43	A growing number of people in (*my community*) will buy an electric bicycle within the next five years
Q44	In my opinion, people will buy many more electric bicycles as soon as the current obstacles have been dealt with
Q45	Many people would support me if I allowed my grid operator to remotely switch on and off non-critical appliances in my home
Q46	A growing number of people have allowed their grid operator to remotely switch on and off non-critical appliances in their home
Q47	In my opinion, people will allow grid operators to remotely switch on and off their non-critical appliances as soon as the current obstacles will be dealt with
Q48	We as people can act together to achieve the energy transition
Q49	As an individual, I can do a lot to support the energy transition
Q50	Suppose you decrease your energy consumption for heating and cooling your dwelling. Would you say that would benefit the energy transition?
Q51	Suppose you buy an electric bicycle within the next five years. Would you say that would benefit the energy transition?If you already have an electric bicycle, please indicate whether you think purchasing it contributed to the transition to a renewable energy system
Q52	Suppose you allow your grid operator to remotely switch on and off non-critical appliances in your home. Would you say that would benefit the energy transition?

Q53	I feel a personal obligation to be energy efficient (e.g., using public transport instead of a personal car, turning off lights when leaving the room, using technical appliances which help to save energy)
Q55	I feel a personal obligation to decrease my current energy consumption for heating and cooling my dwelling
Q56	How would you feel if you decreased your energy consumption for heating and cooling your dwelling by 10% over the next year?
Q57	I feel a personal obligation to purchase an electric bicycle within the next five years. (If you already have an electric bicycle, please indicate whether you felt a personal obligation to buy it prior to the purchase.)
Q58	How would you feel if you purchased an electric bicycle within the next five years?
Q59	I feel a personal obligation to allow my grid operator to remotely switch on and off non-critical appliances in my home
Q60	How would you feel if you allowed your grid operator to remotely switch on and off non-critical appliances in your home?
Q61	Acting pro-environmentally is an important part of who I am
Q62	Please choose the picture below which best describes your relationship with the natural environment

Q68	I intend to decrease my energy consumption for heating and cooling my dwelling
Q69	I intend to purchase an electric bicycle within the next five years
Q70	Would you allow your grid operator to remotely switch on and off non-critical appliances in your home if you were offered an annual discount of
Q71	I intend to commit in collective action together with other consumers or providers of energy (e.g., joining consumer initiatives, joining photovoltaic producer groups)
Q72	I behave more environmentally friendly if my friends do it
Q73	I behave more environmentally friendly if my neighbours do it
Q74	I behave more environmentally friendly if most of other people do it
Q75	How many km per year do you drive a car as a driver (privately incl. driving to work)?
Q76	How often do you drive alone in the car? (For private purposes - including trips between your home and working place)
Q77	How many people in total are usually in the car when you are the driver? (For private purposes including trips between your home and working place)
Q78	What type of propulsion does the private car you most commonly use have?

Q79	What is the fuel consumption (litres per 100km) you have with your most commonly used car?
Q80	What is the average distance you can drive with a fully charged battery?
Q81	How many km per year do you ride a motorbike or scooter (privately incl. driving to work)?
Q82	What is the fuel consumption (litres per 100km) of your most commonly used motorbike or scooter? (privately incl. driving to work)
Q83	For how many trips per week are you a passenger in a private vehicle?
Q84	When you are a passenger in a private vehicle, how many people including yourself are usually in the car?
Q85	Which type(s) of public transportation do you use as a part of your routine mobility? (please choose all that apply)
Q86	Time spent in type(s) of public transportation
Q90	Please choose the answer that best describes your bicycle use
Q91	Please choose the response that fits your opinion about carsharing the best
Q92	About how many hours have you spent on private flights during the last year?
Q93	Did you take any business trips by plane during the past year?
Q94	In what type of house do you live?

Q95	How much indoor living space does your household have?
Q96	How is your home primarily heated?
Q97	Do you know what your primary heating fuel is?
Q98	What do you think about your preferred room temperature setting compared to other people you know in your country?
Q99	How often do you use air condition at home during the summer?
Q100	When was the house in which you live built?
Q101	What type of renovation was made to the house in which you live (if any)?
Q102	How often do you disconnect electric appliances from the power supply when you are currently not using them? (Specifically TV, PC, Notebook, DVD-Player etc.)
Q103	What proportion of your light bulbs at home are energy saving varieties (e.g. LED, compact fluorescent, etc.)?
Q104	Do you purchase your electricity from a provider with a particularly high share of renewable energy production?
Q105	How many warm meals do you personally eat per week?
Q106	Please choose the answer that best describes your diet
Q107	How is hot water provided in your home?

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