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Report No ECHOES 5.1 – Comparative Assessment Report on European Energy Lifestyles

Report

Comparative Assessment of European Energy Lifestyles



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Report

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ABSTRACT

In the ECHOES project, we conducted a multinational quantitative assessment of energy related lifestyles and behavioural patterns, using survey data from 31 European countries and an additional in-depth qualitative assessment in six countries (Austria, Bulgaria, Italy, Norway, Spain, Turkey). Since widely-used methodological approaches for lifestyle research turned out not to provide conclusive results for the domain of energy relevant behaviour, we applied the alternative approach of “impact based” lifestyle research. This methodological approach identifies groups on the basis of the energy demand caused by their behaviour in different areas of life, which allows a more reliable identification of the *driving factors* behind different patterns of energy and climate relevant behaviour. This more holistic understanding of how social, psychological, infrastructural, cultural and political factors influence energy and climate relevant behaviour in different European countries provides a broad basis for target-group- and impact-oriented policy design.

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EXECUTIVE SUMMARY

One of the aims of the ECHOES project is to provide a more systematic view on energy related decisions and behavioural choices of individuals who are themselves part of groups (meso-perspective). In order to foster a more holistic understanding of how different societal groups conduct their everyday lives and how they make energy and climate relevant decisions in different areas of life, we collected individual data about **energy related behaviour in six main areas of life (Housing, Mobility, Diet, Consumption, Leisure, and Acquisition of Information)** from approximately **18.000 respondents in 31 European countries** (EU-28, Norway, Turkey, and Switzerland). By applying the **newly developed approach of impact based energy lifestyle research** for the first time in a multi-national research setting, we quantitatively assessed the driving factors behind energy and climate relevant behaviour and related impacts and additionally conducted focus group discussions with participants who have a remarkably high or a remarkably low lifestyle related primary energy demand in six countries (Austria, Bulgaria, Italy, Norway, Spain, Turkey) in order to create a more holistic understanding and foster the interpretation of the quantitatively significant factors.

Methodologically, the research process has been strongly oriented towards what cannot be adequately mapped with the methods commonly used so far. It is a regularly observed phenomenon that attitudes, subjective norms, perceived behavioural control, and the resulting behavioural intention lead far less systematically to corresponding behaviour than this should be the case from a theoretical point of view. For this purpose, the term **"attitude-action gap"** has been established. Research has shown a discrepancy between attitude and action ranging from 2% to 65%, depending on the behavioural category (Binder and Blankenberg, 2017). According to the low-cost hypothesis (Diekmann and Preisendörfer, 1992), the discrepancy gap tends to be small for environmentally friendly behaviours that are associated with low subjective costs (e.g. turning off the lights when leaving a room) and large for environmentally friendly behaviours that are associated with high subjective costs (e.g. not visiting a certain holiday destination in order to avoid emissions). This basically means that a significant number of people is willing to perform "pro-environmental" behaviour, but only under certain conditions, which results in the second gap discussed in research literature: the **"behaviour-impact gap"** (Csutora, 2012). Obviously, it is a variety of internal and external factors that play a crucial role in the shaping of behaviour itself and the emergence of the aforementioned "gaps".

Instead of being primarily based on psychological variables or selected behaviours, **impact-based energy lifestyle research** has a strong focus on all energy- and climate-relevant behaviours conducted by individuals. Thereby, the spectrum and quality of individual behaviours is understood as the manifest expression of one's lifestyle, which can be quantified with an impact currency. In the concrete case of energy lifestyles, this impact currency is the primary energy demand in Megajoules (MJ) per individual and year. Depending on the research focus addressed in the respective chapters, subgroups with e.g. (a) specific *impact-intensities* or (b) specific *impact-patterns*, respectively, were identified. A major advantage of the impact-based method is the following: All factors (psychological, sociodemographic, cultural, infrastructural etc.) that are suspected to influence energy and climate relevant behaviour can be used as explanatory variables in statistical models. This allows a systematic assessment of the **driving factors behind the observed energy behaviour** and enables us to identify **those factors that are (I) accessible and (II) effective for policy interventions**.

The analyses with regard to energy lifestyles conducted in the ECHOES project are organised in three parts:

In the **first analytical step**, linear regression models were calculated for the **overall lifestyle energy impacts in the six partner countries (Austria, Bulgaria, Italy, Norway, Spain, and Turkey)**. This first step is used to identify those driving factors behind impact-relevant behaviour that occur in the individual countries on a national aggregate level. This step is guided by the hypothesis that driving factors are strongly dependent on national energy cultures and therefore do not occur in the same form in different countries.

The **second analytical step deployed a mixed-methods approach** conducted in the same six key countries with a focus on those societal groups whose **lifestyles** are linked to either a **particularly high or a particularly low energy impact**. A quantitative analysis was carried out to determine significant sociodemographic and psychological predictors of whether someone is living a lifestyle with a particularly high or a particularly low energy impact. Additionally, focus group discussions with groups of “high impact” and “low impact” participants (selected on the basis of a short online-survey consisting of 10 questions) were conducted in all six countries. This focus on high- and low-impact groups is intended to provide information on what distinguishes a low-impact lifestyle from a high-impact lifestyle both practically and in terms of driving factors.

The **third analytical step** provides an **overview of energy lifestyles across all 31 European countries** covered by the international survey and the **lifestyle group specific driving factors** behind energy relevant behaviour. This international focus is based on the identification of empirically existent energy lifestyle groups across Europe on the basis of a cluster analysis of the individual energy impact profiles of the entire sample. The drivers behind the group-specific behavioural profiles are identified by assessing the factors that proved to have a high (statistical) significance for the group assignment. The knowledge generated in the third step is intended to provide new insights regarding how policy measures at European level could better take target group related particularities into account.

As it was expected in view of the discrepancies between attitudes and behaviour, the analyses on national aggregate levels (**first analytical step**) revealed only few significant effects for psychological and attitudinal predictors: For example in Italy the support for the statement that renewables create new jobs is positively associated with the individual overall lifestyle energy impact. In Austria, Norway and Spain, the subjective personal obligation to behave in an energy saving manner is associated with a slightly smaller lifestyle energy impact. In Spain, the acceptance for policy measures that might result in higher individual costs is associated with a higher lifestyle energy impact. Most of the revealed phenomena will have to be discovered in more detail, taking specific national framework conditions into account. However, the findings on the national level, and in particular the few significant effects between psychological parameters and lifestyle energy impact, seem to confirm the guiding assumption that **the “average citizen” does not exist**.

During the **second analytical step**, with a focus on groups with **particularly high or particularly low energy impacts**, it could be shown that many policy relevant effects are located on the upper and lower limits of the energy intensity spectrum and cannot be detected with linear regression models. It was concluded that especially the driving factors that lead to extraordinarily high or extraordinary low impacts can be very informative in the search for **policy strategies supporting the Energy Transition and the SET-Plan**. The subjective social status is the only driving factor for which significant effects could be shown at subgroup level in *all* six countries. It thus comes closest to the desire for a universal predictor of lifestyle-specific energy impact. However, it must always be kept in mind that all driving factors are *probabilistically* related to the lifestyle energy impact, which means that **the aim of identifying effective trigger points for policy interventions or communication strategies** can only be achieved when **specific framework conditions on subgroup level** and the **complex interplay between seemingly independent areas of life** are systematically taken into account. This holistic approach helps to detect and counteract unintended consequences between seemingly independent areas of life early (like the **rebound effect**) and to detect and utilise positive interactions like the **spillover** of energy efficient behaviour from one area of life to another.

The **third analytical step** again proved the thesis that the “average citizen” with regard to energy behaviour does not exist, but revealed **typical groups** by identifying Energy Lifestyles on the basis of energy demand profiles which were estimated for more than 18000 survey respondents. By developing detailed **characterisations of the six identified European Energy Lifestyles**, and by quantitatively assessing the **driving factors** behind the respective patterns of energy relevant behaviour, a tangible overview of major groups with regard to cross-domain and cross-sectoral energy behaviour in 31 countries could be developed.

With regard to policy related recommendations, especially three main points can be emphasised:

- **Firstly**, those groups of people who already have a **particularly low or a particularly high lifestyle-specific energy-demand** should be considered **useful starting points for strategic policy making**.
- **Secondly**, sector-specific **policy making** in the area of energy and climate-protection should be complemented by a **holistic perspective**. For example, a particularly high energy demand in the area of mobility is frequently linked to the lifestyle-related decision about the place of residence.
- **Thirdly**, instead of focusing on an idealised “average citizen”, **lifestyle specific behavioural patterns** should be identified and systematically taken into consideration. In order to enable **strategic longitudinal monitoring** of how energy relevant behavioural patterns and related energy demands develop in different target groups over time, the **collection and standardised analysis of panel data** must be ensured.

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1. ASSESSMENT OF EUROPEAN ENERGY LIFESTYLES

1.1. Aim of the report

One of the aims of the ECHOES project is to provide a more systematic view on energy related decisions and behavioural choices of individuals who are themselves part of groups (meso-perspective). In order to foster a more holistic understanding of how different societal groups conduct their everyday lives and how they make energy and climate relevant decisions in different areas of life, we collected individual data about energy related behaviour in six main areas of life (Housing, Mobility, Diet, Consumption, Leisure, and Acquisition of Information) from approximately 18.000 respondents in 31 European countries (EU-28, Norway, Turkey, and Switzerland). By applying the newly developed approach of impact based energy lifestyle research for the first time in a multi-national research setting, we quantitatively assessed the driving factors behind energy and climate relevant behaviour and related impacts. Additionally, we conducted focus group discussions with participants who have a remarkably high or a remarkably low lifestyle related primary energy demand in six countries (Austria, Bulgaria, Italy, Norway, Spain, Turkey) in order to create a more holistic understanding and foster the interpretation of the quantitatively significant factors.

1.2. Status quo and previous findings from energy behaviour and lifestyle research

Behind social science research on the topic of "energy behaviour" stands the quest to understand the reasons for different variations of behaviour. For the application case in ECHOES, a good understanding of reasons behind different energy specific behavioural patterns means that targeted measures can be applied to achieve behavioural change. A particularly relevant bundle of possible driving factors behind energy- and climate-relevant behaviour in the social sciences are psychological *attitudes*, *subjective norms*, and *perceived behavioural control*. For example, the nearly classic, and regularly considered theory of planned behaviour (TPB) (Ajzen, 1991) suggests that these three factors lie behind behavioural intent, which in the end results in behaviour with a close relationship to the psychological characteristics of an individual. In empirical practice, statistically significant correlations in the sense of the theory are regularly shown (Hansla et al., 2008), but often these relationships are relatively small in terms of their effect size, so that they only explain a relatively small part of observed behaviour. In most cases, psychological characteristics (which are of course not limited to the three factors of the aforementioned TPB) are moderated by a variety of other factors, like for example living conditions with restricted opportunities for energy-saving behaviour.

This results in the regularly observed phenomenon that attitudes, subjective norms, perceived behavioural control, and the resulting behavioural intention lead far less systematically to corresponding behaviour than this should be the case from a theoretical point of view. For this purpose, the term "**attitude-action gap**" has been established. An attempt was made to empirically determine the magnitude of this gap (Binder and Blankenberg, 2017), which showed a discrepancy between 2% and 65%, depending on the behavioural category. According to the low-cost hypothesis (Diekmann and Preisendörfer, 1998), the gap tends to be small for environmentally friendly behaviours that are associated with low subjective costs. For example, only 2% of respondents who described themselves as *mostly or completely environmentally friendly* reported to let the tap water running while brushing their teeth. In contrast, the gap is larger for those behaviours where the ecologically better alternative is linked to higher subjective costs. In contrast, 53% and 65%, respectively, of environmentally aware people reported to not share their car with others and to not avoid air travel. In other words: In high-cost behaviours (Diekmann and Preisendörfer, 2003), the majority of people do not behave according to their self-perception. This discrepancy between attitudes and actions in behaviours with a high environmental impact has the consequence that the explanation of behaviours on the basis of psychological characteristics alone does not lead to satisfactory results.

However, the above mentioned differences between "high cost" and "low cost" behaviours leads to another problem: Drawing general conclusions from selected (low-cost) pro-environmental behaviours (PEBs), like substituting light bulbs with LEDs or separating waste, on an individual's behaviour in general or on the resulting environmental impact is also unreliable. This second gap was referred to as "**behaviour-impact gap**" (BIG) (Csutora, 2012). A variety of internal and external factors (of which many are context-dependent) are considered

to play a crucial role in the shaping of behaviour itself and of both above mentioned gaps. Due to this large variety of additional factors, the development of a universal framework that incorporates *all* factors that moderate the relationship between individual psychology and actual behaviour must still be considered pointless (Kollmuss and Agyeman, 2002).

Thus, the basic problem remains widely unchanged: the attitude-action gap and the behaviour-impact gap lead to major limitations in the usefulness of numerous variables that are frequently used for explaining behaviour. This is especially true when it comes to estimating impact-relevant behaviour and associated measures like an energy or carbon footprint (Csutora, 2012). This limitation becomes even more problematic when a larger variety of behaviours is of interest, which is e.g. the case in “lifestyle” oriented research. When one infers from psychographic parameters or selected pro-environmental behaviours to energy- or climate-relevant behaviour in general (i.e. across several areas of life), the already relatively large uncertainties accumulate so that the explanatory power again drops dramatically. Thus, psychologically defined lifestyle typologies are characterised by a particularly high inconsistency between expected and observed behaviour: for example, four groups were identified from a representative sample in Austria on the basis of a general sociological lifestyle model, named “Experience Milieus” (Schulze, 2005). The four groups were expected to differ significantly in their lifestyles and in the resulting impacts in terms of energy demand and emissions. In fact, however, they turned out to differ only marginally (Bohunovsky et al., 2011). Similarly inexplicable are some of the results obtained in another study on “Energy Styles” in Austria, in which a typology composed of energy-related psychological parameters was used: for example, a group characterised as “Disoriented Polluters” (German: “*Orientierungslose Umweltsünder*”) was found to have an above average share of respondents who cycle in everyday life, while a group of “Eco-Responsible” respondents (German: “*Ökologie-Verantwortlicher*”) turned out to have a below average share of cyclists (Hierzinger et al., 2011). Inconsistencies of this kind led to the decision to choose the alternative approach in which the subgroups are selected on the basis of their actual behavioural patterns or on the basis of energy impacts. This somewhat turned-around approach ensures that the identified lifestyle groups actually differ in their behaviour and not primarily in their attitudes and ways of thinking. Subsequently, it can be assessed **which driving factors lead different groups to their specific behaviour**. To our knowledge, in ECHOES it is the first time that an impact based energy lifestyle research approach is applied in an international project.

1.3. Impact Based Energy Lifestyle research and its role for policy design

If the energy transition is to succeed and the targets of the Paris Agreement are to be met, a comprehensive knowledge base must serve as a starting point for all related policy decisions. The unconventional methodological approach of impact based energy lifestyle research developed in ECHOES Task 5.1 and empirically implemented in Task 5.2 aims at providing the methodological fundament for such a comprehensive knowledge base. A selection of empirical results is expected to create a new perspective on a variety of questions related to energy behaviour and targeted policy interventions in accordance to the **Energy Transition** and the Strategic Energy Technology Plan (**SET Plan**). Starting from the assumption that **the average citizen does not exist**, it takes a (lifestyle-) group level perspective and is guided by the four key-questions on (I) **Who?** consumes (II) **how much?** (III) **of what?** and (IV) **why?** (Figure 1: Four key-questions of energy lifestyle research)

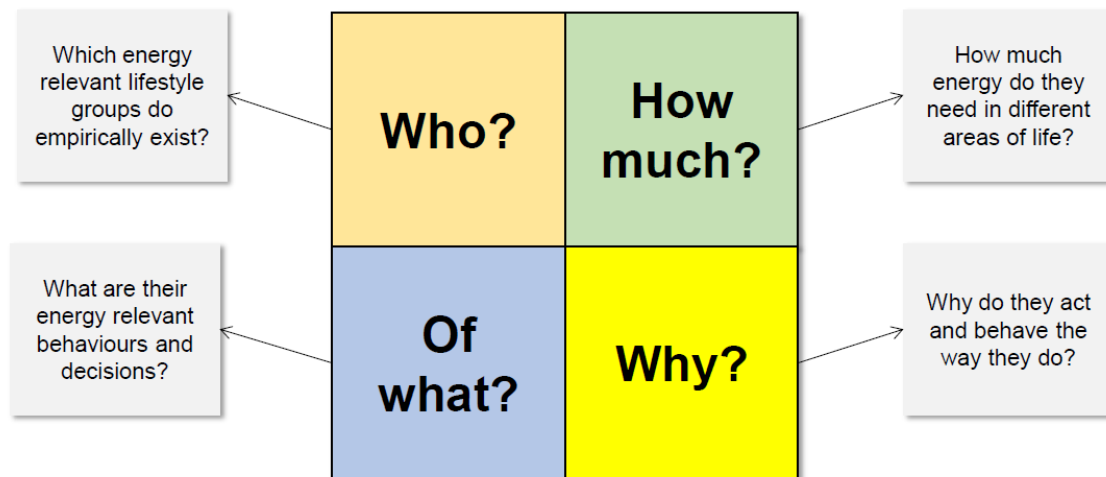


Figure 1: Four key-questions of energy lifestyle research

As the above discussed state-of-the-art shows, relying on the statistical relationship between psychological parameters and energy-relevant behaviour only does not reliably lead to the identification of lifestyle groups with different behavioural patterns. However, since the group level cannot be ignored as a crucial starting point for target-group specific policy measures, ECHOES Task 5.1 has developed an interdisciplinary approach that is less affected by the above discussed gap between attitudes and behaviour (Binder and Blankenberg, 2017), and not affected by the gap between pro-environmental behaviour and impacts (Csutora, 2012). While the basic concept behind this methodological approach is shortly outlined in the following, the methodological details and the operationalisation is more extensively described in the methodology section (chapter 2).

Instead of being primarily based on psychological variables or selected behaviours, Impact-based lifestyle research has a strong focus on all energy- and climate-relevant behaviours conducted by individuals. Thereby, the spectrum and quality of individual behaviours is understood as the manifest expression of one's lifestyle, which can be quantified with an impact currency. In the concrete case of energy lifestyles, this impact currency is the primary energy demand in Megajoules (MJ) per individual and year. The primary energy demand results from the quality and quantity of an individual's "lifestyle" specific behaviour. Operationally, this strong focus on behaviour means the following: in a first step, data about energy relevant behaviour and equipment use is collected in a standardised survey. In a second step, the approach uses the survey data to estimate the respondents' behavioural impacts in terms of primary energy demand for six main areas of life (Housing, Mobility, Consumption, Diet, Leisure, and Acquisition of Information). In a third step, depending on the research focus, subgroups with e.g. (a) specific *impact-intensities* or (b) specific *impact-patterns*, respectively, are identified. This could be (a) a group of people with a remarkably high or low overall energy demand (chapter 3.2) or (b) a group of people with a significantly distinct distribution of energy demand across different areas of life (chapter 3.3). On the basis of information with regard to how their energy demand is distributed across different areas of life and how high their energy demand is, initial

conclusions can already be made about the lifestyle of a concrete group of people. However, the key analytical step in which a major advantage of the impact-based method arises is the following: All factors (psychological, sociodemographic, cultural, infrastructural etc.) that are suspected to influence energy and climate relevant behaviour can be used as explanatory variables in statistical models. This allows a systematic assessment of the **driving factors behind different forms of energy behaviour** and determines **which of these factors are (I) accessible and (II) effective for policy interventions**.

Since the spectrum of relevant questions is large and not all of them can be considered in a single research process and document, this report focuses on **three selected questions**:

- 1) Are there universal driving factors for lifestyle-specific energy impact at country level?
- 2) How do the six key-countries Austria, Bulgaria, Italy, Norway, Spain, and Turkey differ in terms of driving factors that lead to lifestyles with extraordinary high or extraordinary low energy impacts?
- 3) Which energy lifestyles can empirically be identified across the 31 addressed European countries?

2. METHODOLOGY

In the following, the methodology and the operationalisation of impact based energy lifestyle research in the ECHOES project is described in more detail.

2.1. Theoretical background

From the considerations about the relationship between attitude, behaviour, and behavioural consequences discussed above, the following problem arises: A typology that is intended to represent the construct "group-specific behaviour" cannot be valid if it is created on the basis of variables that are, e.g. due to the attitude-action gap, only weakly related to the behaviours of interest. Among other things, the low validity of conventional approaches has led to the question of whether lifestyle research has any future at all (Hartmann, 1999; Hermann, 2004; Otte, 2005). Based on the idea that it still makes sense to take a broader (lifestyle) perspective on energy and climate-relevant **behaviour**, ECHOES used the impact based method of group selection in which the indicator for group assignment (primary energy demand) is calculated on the basis of self-reported behaviour. Thus, the resulting typology has a higher validity with regard to the relationship between group membership and behaviour. If interesting relationships between these group-specific behavioural patterns on the one hand, and psychological, demographical, structural or political driving factors on the other hand can be identified, new opportunities for target group oriented policy-design may arise.

In order to systematise the impact-based research approach, the theoretical lifestyle concept of Lüdtke is used in the following. This three-part scheme distinguishes the three components "Performance", "Mentality", and "Situation" (Lüdtke, 1996). In the specific application case of "energy lifestyles", the "Performance" component comprises information about the respondents' energy relevant behaviour, which is used both (I) descriptively and (II) as the basis for estimating their individual behavioural impacts with the means of Lifecycle Assessment (LCA). "Situation" comprises information about the respondents' living situation in a broader sense, by containing e.g. data about their place of residence, their household size and setting, their education, and their social status. The "Mentality" component contains psychological variables that are considered to be explanatory for climate and energy relevant behaviour. Most of the "Mentality" related variables come from survey items contributed by ECHOES WP4, whose micro-level perspective focuses primarily on the individual. Their use at the group level in WP5 results from the fact that impact-based energy lifestyle groups represent collectives that are identified for analytical purposes and whose members usually do not know each other. Thus, group level dynamics in the conventional sense (for example orientation on other group members) do not play a role *within* the energy lifestyle groups, which is the reason why the psychological component can, to a large extent, be covered by individual psychological variables.

During its first empirical implementation in the run-up to the energy lifestyle research in ECHOES, the outcome of the newly developed approach of impact based lifestyle research could be directly compared to the results of a previous study that had used the same dataset but a conventional approach of assigning individuals to lifestyle groups via psychological and attitudinal variables. This comparison demonstrated that the identification of lifestyle groups on the basis of energy demands for different activities leads to a more meaningful typology of energy lifestyles than this is the case with a conventional typology (Schwarzinger et al., 2018). Due to the dataset used, this prototype could only consider behaviours in which energy is used by individuals directly (e.g. driving a car, using electrical appliances, heating). The procedure conducted in ECHOES goes one step beyond and focuses on a larger variety of behaviours: The Energy Transition and the SET Plan are not limited to behaviours in which energy is visibly delivered to the user in the form of heat, light, electricity or motion, but also energy that is needed to provide products and services, which is the reason why a distinction between six areas of life (see "Performance" component in Table 1) is used in ECHOES. These six areas of life serve as a framework under which all energy and climate-relevant activities in terms of consuming goods and services find their place (excluding the "consumption" of public infrastructure and emergency services or medical treatment).

It must be noted that the number of variables for all three categories ("Performance", "Situation", and "Mentality") was restricted due to limitations with regard to the length of the survey. There is therefore no comprehensive set of variables available for each of the three categories, but rather a trade-off that we consider acceptable.

Table 1: Three main components of Energy Lifestyles following the theoretical framework by Lüdtke (1996) and specified for the use case of impact based energy lifestyle research in ECHOES.

Lifestyle Component	Data collected and role in analysis
PERFORMANCE	<p>Data about energy and climate relevant behaviour and specific equipment-use in six areas of life: <i>Housing, Mobility, Diet, Consumption, Leisure, Acquisition of Information</i></p> <p>Example for individual level data from the area of Mobility: Respondent No. 123 uses a Diesel powered car with an average fuel consumption of xy litres/100km. During the average annual distance of 12345 kilometres per year, there are usually 2 people in the car.</p> <p>Example for impact estimation: Based on the collected data about the fuel type, the efficiency, the distance driven, and the occupation rate, the estimated impact caused by car-use for respondent No. 123 is 1234 MJ energy per year.</p>
SITUATION	<p>Sociodemographics and variables describing the respondent's living situation.</p> <p>The following variables were used:</p> <p>Age (categories) Gender Urban/rural living environment (2-step variable, 10.000 residents threshold) Number of household members Number of children under the age of 14 in the respondents household Educational level (4-step variable) Subjective social status (5-step variable)</p>
MENTALITY	<p>Psychological variables measuring the respondent's attitudes, values, intentions etc.</p> <p>The following variables and scales were used:</p> <p>Political orientation - self-positioning according to left/right scheme (2-item scale) Support for the statement "Renewables are good for the climate" (5-step scale) Support for the statement "Renewables create new jobs" (5-step scale) Belief in climate change (5-step scale) Perceived normative pressure from society to behave in an energy-saving manner (3-item scale) Self-Efficacy (5-step scale) Subjective personal obligation to behave in an energy saving manner (2-item scale) Pro-Environmental Identity (5-step scale) Intention to support the Energy Transition (5-step scale) Acceptance of energy policy measures that might increase individual costs (2-item scale)</p>

2.2. Operationalisation

The following section describes the main structure of the energy lifestyle research process conducted in ECHOES.

2.2.1. Quantitative survey and preparation of impact data

As mentioned above, a data collection by means of a survey provided the empirical data basis for the impact based energy lifestyle research conducted in ECHOES. The data collection covered 31 European countries (EU-28 + Norway, Turkey, and Switzerland) and about 18,000 respondents. The generated data set covers the research interests of WP4, WP5 and WP7. While the whole “Performance” part was specifically designed for the energy lifestyle part of WP5, the dimensions “Mentality” and “Situation” could almost entirely be covered by WP4 variables and by general sociodemographic variables. For the full list of variables used, see the Appendix.

The “Performance” data section was used to estimate the respondents’ individual impacts in terms of primary energy demand in six different areas of life on the basis of the respondents’ answers with regard to their behaviour. Similarly, it was in some cases not possible to estimate the impacts of buying-behaviour *only* on the basis of survey-responses, since e.g. the frequency of buying new clothes could only be surveyed using a five-step scale (from “modest” to “highly fashionable”). This simplified approach had to be chosen for consumption, hobbies/leisure and information behaviour because the majority of respondents were unable to provide more detailed information about the exact number and type of the respective activities during the pre-test. In such cases national per-capita statistics were used as a reference and a correction factor was applied according to the respondent’s answers. A wide range of national statistics combined with life-cycle energy factors (for each impact category) was used for this purpose. The country-specific data used for this purpose are listed in

Table 2. The life-cycle primary energy demands per service are extracted from the Ecolnvent V3.1 (Wernet et al., 2016) and GEMIS V4.95 (IINAS, 2018) databases.

Table 2: Parameters and sources of country-specific national data used in the calculation of the respondents' individual impacts based on "Performance" related survey answers

Lifestyle area	Parameter name	Description	Source
Housing	Energy for heat (MJ/m3)	Building type, age, amount of renovation specific values for each country	(Loga et al., 2016; TABULA and EPISCOPE., 2017)
	Electrical primary energy per unit energy	2020 Country-specific values	(IINAS, 2018)
	Cooling degree day, heating degree day, average temperature below < 15°, Average temperature > 24°	1990 – 2017 Population weighted mix of data for the 10 largest cities per country self calculation	NOAA: National Oceanographic and Atmospheric Administration (2018). Climate Data Online. Available at https://www.ncdc.noaa.gov/cdo-web/ Accessed 2018-12-13.
Mobility	Ave vehicle trip length (km)		(Pasaoglu et al., 2012; Ahern et al., 2013)
	Ave. Public transportation velocities (km/hr)	2016	(Alexopoulos and Wyrowski, 2015; Ruter, 2015; Wiener_Linien, 2016; Barcelona, 2018; Madrid S.A., 2018) https://moovitapp.com/insights/en/Moovit_Insights_Public_Transit_Index-commute-distance https://www.netzsieger.de/ratgeber/der-grosse-geschwindigkeits-index
	Fraction of short haul flight: private and business	2016	EUROSTAT: Air passenger transport by reporting country [avia_paoc], EUROSTAT: Number of trips by country / world region of destination [tour_dem_ttw], EUROSTAT: Number of trips by mode of transport [tour_dem_tttr]
Consumption	Energy for lighting, appliances and cooking	2016	EUROSTAT: Total Residential - EU28 - 2016 ref. year (TJ)
	Clothing	2016	EUROSTAT: PRODCOM Codes: 14111000 – 14391090
Diet	Consumption of 18 food groups (g/cap/day)	2013	FAO (2018) Food Balance Sheets.
Leisure Activities	Energy per capita from Service Sector	2016	EU Commission: ENERGY STATISTICS: Energy datasheets: EU28 countries
Acquisition of Information	Average lifetimes of cellphones, computers and flat screen monitors	2016 Calculated from annual consumption (production + imports – exports)	EUROSTAT: PRODCOM Codes: 26201100, 26302200, 26403460,

2.3. Analysis strategy

The analysis of the Energy Lifestyles was divided into three parts. On the one hand, the available resources in the partner countries were used to generate an in-depth understanding about the situation in these selected countries. On the other hand, an overview of Energy Lifestyles in Europe was generated on the basis of the survey data.

In the **first analytical step**, linear regression models were calculated for the **overall lifestyle energy impacts in the six partner countries (Austria, Bulgaria, Italy, Norway, Spain, and Turkey)**. This first step is used to identify those driving factors behind impact-relevant behaviour that occur in the individual countries on a national aggregate level. This step is guided by the hypothesis that driving factors are strongly dependent on national energy cultures and therefore do not occur in the same form in different countries. This kind of knowledge is central to the question about which strategies are appropriate for increasing energy efficiency and promoting the energy transition on a national and international level.

The **second analytical step, with a mixed-methods approach** conducted in the same six key countries focuses on those societal groups whose **lifestyles** are linked to either a **particularly high or a particularly low energy impact** (as the exemplary profiles A and B in Figure 2 could be). On the one hand, a quantitative analysis was carried out to determine significant sociodemographic and psychological predictors of whether someone is living a lifestyle with a particularly high or a particularly low energy impact. On the other hand focus group discussions with groups of “high impact” and “low impact” participants (selected on the basis of a short online-survey consisting of 10 questions) were conducted in all six countries. This focus on high- and low-impact groups is intended to provide information on what distinguishes a low-impact lifestyle from a high-impact lifestyle both practically and in terms of driving factors. A **high- or low-impact lifestyle was defined by an individual overall lifestyle energy impact greater or smaller than that of the remaining 90% of the sample**. Accordingly, the high- and low-impact subgroups in each country represent the 10% with the highest and the 10% with the lowest energy impact respectively.

The **third analytical step** provides an **overview of energy lifestyles across all 31 European countries** covered by the international survey and the **lifestyle group specific driving factors** behind energy relevant behaviour. This international focus is based on the identification of empirically existent energy lifestyle groups across Europe on the basis of a cluster analysis of the individual energy impact profiles of the entire sample. The driving factors for group-specific energy impact profiles (see examples in Figure 2) are then identified by analysing the factors that are expected to play a significant role for the group assignment. The knowledge generated in the third step is intended to provide new insights regarding how policy measures at European level could better take target group related particularities into account.

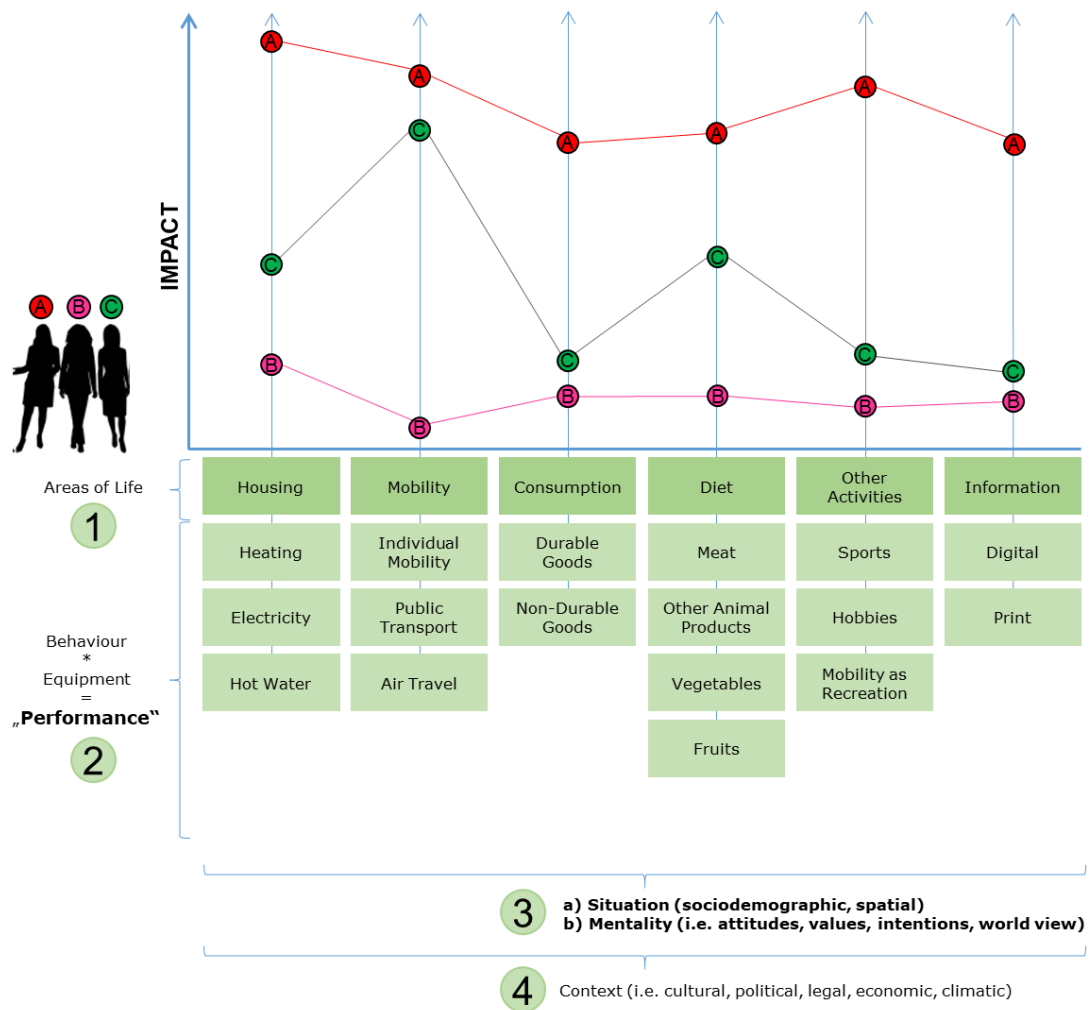


Figure 2: Visual representation of how "Performance" (2) in six areas of life (1) leads to exemplary impact-profiles (A, B, C), influenced by driving factors (3) and context parameters (4)

3. RESULTS

First of all, the **descriptive results** for the bottom-up estimation of the **national average** lifestyle related primary energy demand in the six key-countries are presented in Table 3 and visually depicted in Figure 3.

Table 3: Results for the estimations of annual per capita primary energy demand per country and area of life, based on survey-responses.

	AUSTRIA		BULGARIA		ITALY		NORWAY		SPAIN		TURKEY	
	MJ	%	MJ	%	MJ	%	MJ	%	MJ	%	MJ	%
Housing	39240	34,9	27580	32,6	32681	27,5	33698	28,1	21466	21,8	16817	17,0
Mobility	38441	34,1	37623	44,5	54401	45,7	45645	38,0	43131	43,8	60140	60,9
Consumption	5879	5,2	3766	4,5	6065	5,1	6483	5,4	7578	7,7	3999	4,1
Diet	15385	13,7	8223	9,7	14376	12,1	14923	12,4	15561	15,8	10056	10,2
Other Activities	12762	11,3	6292	7,4	10656	9,0	18288	15,2	9579	9,7	7096	7,2
Acquisition of Inform.	865	0,8	1018	1,2	874	0,7	1018	0,8	1171	1,2	616	0,6
Total	112573	100	84502	100	119054	100	120055	100	98486	100	98725	100

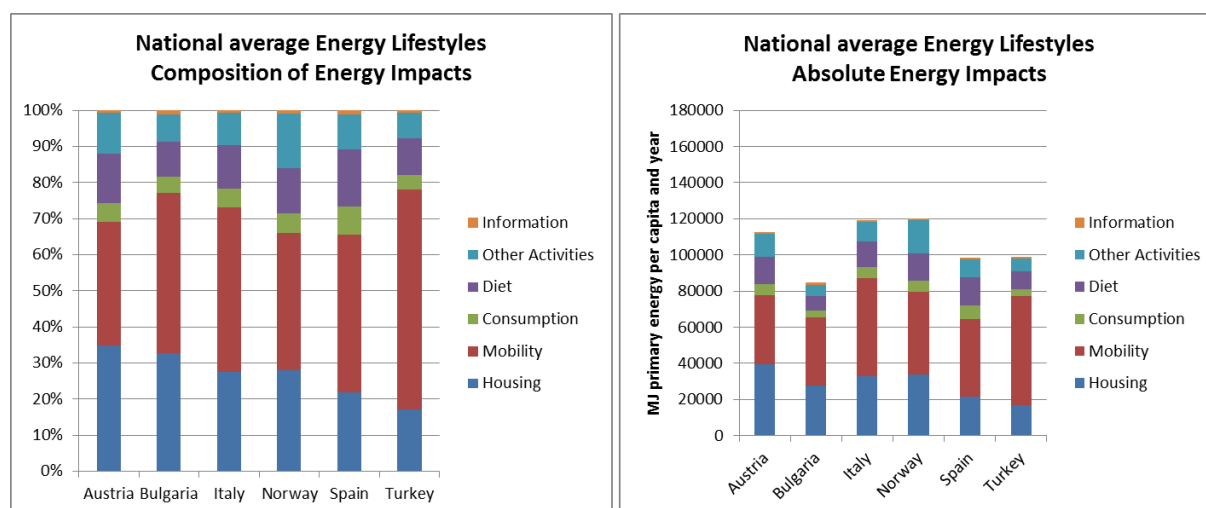


Figure 3: Visual representation of national average lifestyle energy impacts - per country and area of life

Some of the general between-country variation in per capita primary energy demand is easily explainable from national circumstances ("Context", according to Figure 2). For example, a large part of the energy for housing is heating demand which is dependent on climate (heating-degree days - HDD). Hence, Austria and Norway, countries with a large number of HDD have high energy demands for housing, while Spain and Turkey have a small number of HDD and relatively low housing energy demands for housing. Such climatic variations are also apparent in the "other activities" area since energy for heat is also a strong component of services. The variation in mobility, however, reflects to a greater extent the answers from the respondents. Consumption and diet have been calculated by a combining of top-down national averages and bottom-up survey results. For both this areas, the average country value has been preserved. Hence, that Bulgaria and Turkey have lower energy demands for consumption corresponds to the economic situation in these countries. Diet is also strongly influenced by the responses but is also impacted by the national diet. For example, Austria and Norway have large meat and dairy consumption per person, but in Norway more beef than pork is consumed (and vice versa in Austria).

3.1. Lifestyle energy impact on national aggregate level: Assessing driving factors for “the average citizen” of six countries

The aim of applying linear models for the six key countries is to first **examine whether the individual energy impact is influenced by similar driving factors in different countries.**

While the guiding hypothesis is that the driving factors are strongly dependent on national energy cultures, the existence of universal predictors for behavioural impacts would be very helpful in the development of policy measures for different countries on a single basis. In short, the overview of the regression models shows that, for the six countries analysed, **no universal predictors** could be identified, which means that the factors that influence the individual lifestyle energy impact **on aggregate level** are **different in all countries** (Table 4).

Table 4: Linear regression models for 6 countries. Dependent variable is individual overall lifestyle energy impact measured in MJ annual primary energy demand. (Only significant effects $p \leq 0.05$ are shown)

	AUSTRIA (adj. R ² = 0.137)		BULGARIA (adj. R ² = 0.027)		ITALY (adj. R ² = 0.081)		NORWAY (adj. R ² = 0.111)		SPAIN (adj. R ² = 0.051)		TURKEY (adj. R ² = 0.052)	
Situation	B	Beta	B	Beta	B	Beta	B	Beta	B	Beta	B	Beta
Age category												
Female	-14254	-.167	-9410	-.117	-15787	-.128					16460	.130
Rural environment	10087	.118					8893	.099	12714	.100		
Household Size	-6846	-.210	-3521	-.090	-8179	-.152	-4332	-.121				
Children <14 present	n.s.											
Higher Education	8478	.100							13622	.157		
Subjective Social Status	5202	.104	5795	.098	15419	.184	9255	.165			13715	.170
Mentality	B	Beta	B	Beta	B	Beta	B	Beta	B	Beta	B	Beta
Political Orientation							4598	.146				
Statement: Renewables good for environment					-6922	-.101	5395	.104				
Statement: Renewables create new jobs												
Believe in Clim. Change							-5616	-.129				
Normative Pressure							-5703	-.102				
Self-Efficacy									5210	.112		
Personal Obligation					-11186	-.148			-7108	-.148		
Environmental Identity	-5303	-.120										
Intention to support energy transition									7225	0.11		

A closer look reveals that in all six countries analysed, **no significant singular effects between age and energy impact** can be observed. Only in the case of Norway a significant partial correlation between age and impact can be observed (0.177) when the only control variable is social status. In all other countries, even with this more

pragmatic approach, there is no age effect for the individual energy impact. It can therefore be assumed that age is neither a well-suited nor a universally applicable predictor for the individual lifestyle related energy impact.

The model applied shows a **relationship between gender and energy impact in all countries except Norway and Spain**. Interestingly, female respondents in Austria, Bulgaria and Italy have a significantly lower lifestyle energy impact compared to male respondents, while the opposite is the case in Turkey. It seems reasonable that the exact mechanisms for these sometimes contradictory relationships are highly influenced by national particularities with regard to energy cultures, which indicates that further research would be useful in this respect.

With regard to **urban versus rural living environment**, there are significant effects with regard to the individual lifestyle energy impact in **Austria, Norway and Spain**. In all three cases the relationship is significant with a reasonably large positive effect size, which means that people who live in a rural environment have by average a higher lifestyle energy impact. This is consistent with earlier findings on the relationship between urban/rural living environments and the ecological footprint, for example in Norway (Høyer and Holden, 2003). There is also some empirical evidence that the living environment or the type of housing are themselves likely to significantly influence behaviours in various other areas of life including leisure behaviour with associated land and air transport (Holden and Norland, 2005). The fact that the living environment can be expected to have a significant effect not only with regard to energy demand in the areas of heating and mobility but on consumption patterns in a more general way, makes the added value of a holistic view on overall lifestyle patterns (as it is presented in chapter 3.3) clear.

Concerning **household size**, there are **significant negative effects on the individual lifestyle energy impact in Austria, Bulgaria, Italy and Norway**, which means that people who live in larger households, by average have a smaller lifestyle energy impact. Previous findings on the relationship between household size and heating energy demand, which suggest that economies of scale due to the shared use of space are likely to cause a lower per capita heating energy demand for people who live in larger households (Schuler et al., 2000), make the lack of significant relationships between household size and the overall individual energy impact in three countries counterintuitive at a first glance. Within our dataset, the relationships between household size and per capita heating energy demand turned out to be in line with the scale effect hypothesis in all six key countries assessed.¹ The **missing relationships between household size and overall lifestyle energy impact** in countries where household size and housing energy demand show scale effects, represent one essential fact: many energy related activities are not affected by (household) scale effects and apparently the energy saving due to in-house scale effects are in some countries not large enough to outweigh the energy impacts of activities in other areas of life.

On aggregate level, the **presence of children under the age of 14** in the respondents' households has **no significant effect in any of the assessed countries**. As will be shown in Chapter 3.2, at the level of high and low impact subgroups, the presence of children does reveal significant effects. This indicates that the presence of children - in contrast to what appears to be the case when analysing the aggregate level - is indeed a significant driving factor when it comes to the question if someone has a high impact or a low impact lifestyle. This could be an indication that the consideration of the "average citizen" conceals relevant effects that occur particularly in the peripheral areas of the societal energy impact distribution.

In **Austria and Spain** there is a significant positive relationship on aggregate level between **higher education and the individual lifestyle energy impact**, which means that higher education goes hand-in-hand with a higher lifestyle energy impact. These trends are consistent with the findings of a Canadian study that, for example, has revealed positive relationships between time spent on education and environmental protection in the private sector and between time spent on education and individual CO₂ footprint (Kennedy et al., 2015). However, one could conclude that there are either no educational effects in the remaining countries, or that the connections between

¹ For the purpose of estimating the net effect of household size on individual heating energy demand, only the heating energy demand per capita was experimentally set as dependent variable in the above used regression model. (Standardised coefficients for household size at $p \leq 0.05$: AT: -0.419; BG: -0.325; IT: -0.374; NOR: -0.428; ESP: -0.277; TUR: -0.404)

education and energy impact are different from those between education and CO₂ emissions in the respective countries. At this point, however, it should be anticipated that the analyses on high impact and low impact subgroup level, presented in the following chapter, have revealed significant effects between education and lifestyle energy impact in three instead of two countries.

Concerning the self-assessment of social status, there is a **positive relationship between status and lifestyle energy impact** in five of six countries (except Spain), which means that people who have a higher subjective status tend to also have a more energy intensive lifestyle. With social status being strongly influenced by income, this finding is essentially one of a series of results that revealed a significant positive association of wealth and environmental impact (Lutzenhiser, 1993; Lutzenhiser and Hackett, 1993; Notter et al., 2013; Kennedy et al., 2015; Moser and Kleinhüchelkotten, 2017).

For the **relationship between political orientation and individual overall lifestyle energy impact, a significant effect could only be observed in Norway**. Although Kennedy et al. (2015) found a significant relationship between political attitudes and the carbon footprint in a Canadian study, our findings on aggregate level for five out of six European countries did not determine such an effect. The relationship seems to be either a rare effect that only occurs in certain countries, or the connection between political orientation and impact exists only for the carbon footprint and not for the primary energy impact. In any case, it should be noted here that some more significant effects for the relationship between political orientation and energy impact could be demonstrated at subgroup level (chapter 3.2).

The number of significant relationships between psychological predictors and overall energy demand turned out to be weak or even non-existent on aggregate level in some countries. For example in **Bulgaria and Turkey no significant relationship could be determined**. **Environmental identity**² showed a significant negative relationship in **Austria** only. The **statement that renewables are good for the environment** is a significant predictor for energy demand in Italy and Norway, with a negative relationship (higher support associated with lower energy demand) in Italy and a positive (higher support associated with higher energy demand) in Norway. For the support for the statement that **renewables create new jobs** no significant aggregate level relationship could be found in any of the six countries. The variables **believe in climate change** and **normative pressure** are negatively associated with energy demand only in **Norway**. Other than expected, **self-efficacy** showed a positive relationship (higher value associated with higher energy demand) in **Spain**, and no significant effects in any of the other countries. In the case of the subjective **personal obligation**, the significant effects in **Italy and Spain** correspond with the expected orientation: A higher subjective personal obligation is associated with a lower energy demand. However the intention to support the energy transition is positively associated with energy demand in Spain, which could be the result of a reflection process on the personal energy behaviour.

The findings on the national level in different countries, and in particular the fact that significant predictors are not the same across the analysed countries, seem to confirm the initial assumption that **the "average citizen"**, with regard to how predictors affect overall energy demand, does not exist. If the "average European citizen" existed, predictors for energy demand would show more consistent patterns in the assessed countries. Instead, the ways in which energy relevant behaviour on lifestyle level and an individual's overall energy demand can be constituted are numerous. The fact that an energy lifestyle comprises several areas of life makes the selection of groups based on similarities in their energy consumption behaviour a promising alternative approach. In the next chapter, in which we discuss the findings from the mixed methods approach in the six key-countries, the emphasis is on those energy lifestyle groups that have a particularly high or a particularly low lifestyle energy impact.

² Item: „Acting pro-environmentally is an important part of who I am.“

3.2. Driving factors for “high” and “low” energy lifestyles: A mixed methods approach in 6 countries

In this chapter, the results of the mixed methods approach, focusing on people with “high” and “low” energy lifestyles, are presented. First we discuss the results of the quantitative analysis with special emphasis on the question how the analysis of subgroups with specific energy impact intensities fosters the understanding of driving factors behind energy related behaviour in comparison with the above presented aggregate level perspective. Thereafter the focus group results are presented country by country, where at the end the links between qualitative and quantitative results are discussed for each country.

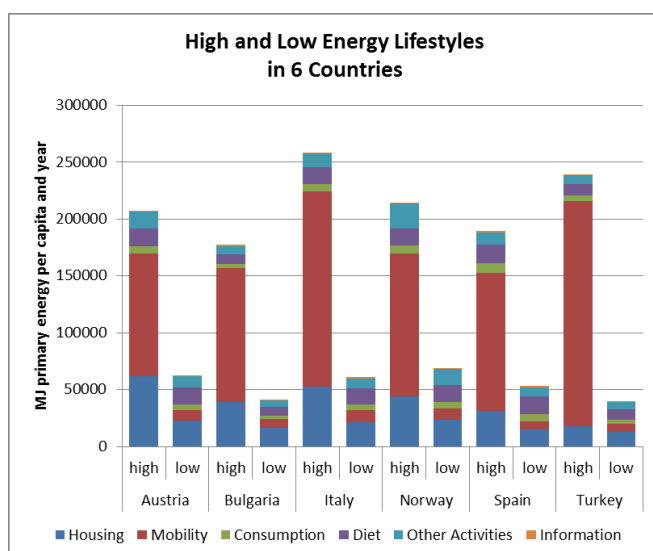


Figure 4: Visual comparison of high and low energy lifestyles per country

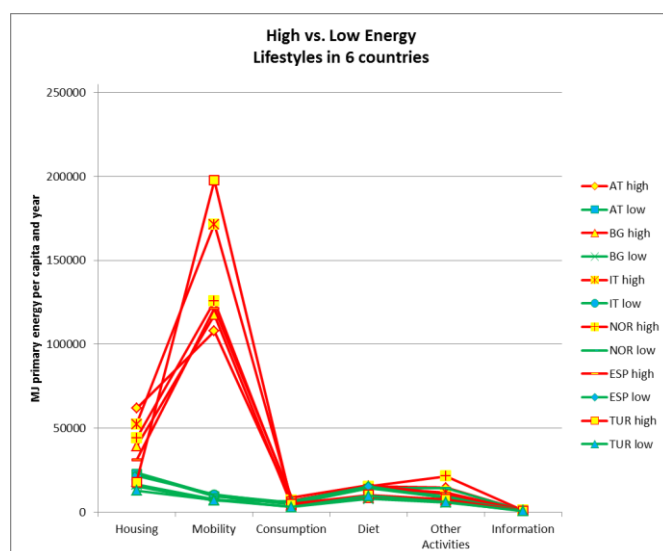


Figure 5: High and Low Energy Lifestyles – impact profiles

One rather interesting phenomenon can already be observed on the basis of descriptive statistics depicted in **Error! Reference source not found.** and Figure 5**Error! Reference source not found.**: The particularly energy-intensive and the particularly energy-saving lifestyles show remarkable similarities across the six different countries with regard to the distribution of their energy demand across the six main areas of life: Firstly, “high” and “low” impact lifestyles have, on average, the highest energy demand in the area of mobility. Secondly, the “high” impact groups have an extraordinarily high energy demand in the mobility sector, while high and low impact groups do, with a cross-national macro view, not differ strongly in most other areas.

Obviously, the question of whether someone has a particularly high or a particularly low lifestyle energy-impact on average depends most on their mobility behaviour. This is presumably caused by the specific role of individual decisions and behaviour in the area of mobility, which is shortly discussed in the following:

In most areas of life, the energy demand resulting from individual behaviour is limited by the framework conditions. For example, the energy demand for housing is strongly dependent on living space, the building type and its characteristics. Prices, regulations, and the human temperature perception, however, determine how someone can live and how someone heats quite strongly. In this way, they codetermine the possible range of home energy demand. The situation is similar for consumption and leisure: monetary and time resources set quite clear limitations with regard to how much an individual can actually consume. Similarly, food consumption is limited by the capability of the human body and also the use of information technologies is apparently not energy-intensive enough to make an individual a member of the 10% group with the highest energy demand represented in the sample. This seemingly natural limitation of energy impacts by external conditions behaves quite differently in the field of mobility: although the goal exists, for example, to gradually make automobiles more energy-efficient, individual mobility has become such an essential element of many societies that the political discourse is often shaped by the claim to ensure the best possible framework conditions for individual vehicle use. When material, legal and economic

framework conditions reflect this high relevance of motorised **individual mobility**, the question of “where and with whom to drive” (distance travelled and number of occupants are the essential factors for individual energy impact in driving) faces **little restrictions**. In addition to spatial and social circumstances that result in a large number of vehicle-kilometres travelled by certain groups of people, also the situation with regard to **air travel** is today often characterised by the fact that very long distances (with a correspondingly high energy impact) can be covered in a **short period of time** and with **relatively low costs**. This does NOT mean that conscious consumption is pointless in any of the aforementioned areas of life! However, **in the case of mobility, the spectrum of individual energy demand is extremely large**, which gives mobility a special role. This means that mobility must especially be kept in mind as an obviously central area of life when the driving factors behind “high” and “low” energy lifestyles are assessed.

3.2.1. Quantitative assessment of driving factors for “high” and “low” energy lifestyles in six countries

In order to generate an understanding about the driving factors for having either a particularly high or a particularly low lifestyle specific energy impact, we used two binary logistic regression models. The dependent variable of the “high” impact model holds the information if a respondent has a “high” impact energy lifestyle or if he belongs to the rest of the sample. The same principle is applied in the low impact model. The models showed that the consideration of **subgroups with specific characteristics** in terms of their energy impact is capable of identifying **more significant effects** and achieve **more explanatory power** in most cases with regard to potential “driving factors” than the above used models on the national aggregate level showed (Table 5).

Quantitative results for “high” and “low” energy lifestyles

In connection with having a particularly high or low lifestyle energy impact, there are **no significant age effects** in any of the analysed countries. However, **differences between men and women** turned out to be significant in **Austria, Italy, Spain, and Turkey**. In **Austria**, women are less likely than men to belong to the group of 10% with the highest energy impact, while in **Turkey** women are more likely than men to have a noticeably high lifestyle related energy impact. In **Italy and Spain**, women are more likely than men to belong to the group of 10% with the lowest energy impact.

This effect is particularly large in **Italy, where women are 2.7 times more likely to have a “low impact” lifestyle** compared to men. The direction of the effects determined in Austria, Italy and Turkey is consistent with the results of the aggregate level models discussed above. The aggregate level effect in **Bulgaria** does not seem to be caused by “extreme” lifestyles, because there is no gender effect in the context of “high impact” and “low impact” lifestyles. In **Spain**, there was instead no aggregate level effect, but a significant effect for low energy lifestyles, which shows that the combination of both the aggregate and the extreme foci generates a plus in knowledge.

With regard to differences between **cities and rural regions**, the analysis of “high” and “low” impact sub-groups shows significant relationships between living environment and lifestyle energy impact in **Austria, Norway, and Spain**. In **Austria and Norway**, the probability of having a particularly small lifestyle energy impact is more than 50% and more than 60%, respectively, smaller for people who live in a rural environment compared to those who live in higher density regions. On the other hand, in **Spain** the probability of belonging to the high impact group is more than two times higher for people who live in a rural environment than for those who live in higher density regions. At this point it should be noted again that the role of the living environment is not only limited to energy demand in the obviously influenced areas of housing and mobility, but that also other, **seemingly independent activities such as different leisure and travel behaviour** must be taken into account when assessing the driving factors in more detail (Høyer and Holden, 2003; Holden and Norland, 2005).

The analysis of the high and low impact subgroups shows household size effects in Austria, Italy, and Turkey. In Austria and Italy, the probability of having a high impact lifestyle is significantly lower for people who live in larger households. Similarly, in Austria and Turkey a larger number of household members is associated with a

higher probability of having a low impact lifestyle. However, further research will have to address how in-house economies of scale (Schuler et al., 2000) and changed behavioural patterns in other areas of life may interact.

While on aggregate level the influence of the **number of children** on the individual overall lifestyle energy impact could not be determined in any of the assessed countries, significant effects with regard to the chance of having a particularly low lifestyle energy impact were observed in three countries, namely **Austria and Turkey**. In **Austria**, the probability of having a low impact lifestyle is higher for people who have children in their households. According to the aforementioned chapter, this could be a result of the fact that children usually have less individual space than adults, while the calculation of per capita housing energy demand does not distinguish between adults and children. However, in **Turkey the opposite** is the case and people with children in their household have a lower chance of having a low impact lifestyle, which again could be part of another independent research question regarding specific phenomena in national energy cultures.

In the national aggregate regression models used above, educational effects could be determined in two countries (Austria and Spain). The focus on high and low impact lifestyles revealed **educational effects in Austria, Bulgaria, Spain and Turkey**. In **Austria and Turkey**, people with higher education are less likely to have a “low impact” lifestyle. A **similarly oriented effect** could be determined in **Spain**, where people with higher education are more likely to have a “high impact” lifestyle. In **Bulgaria instead**, people with higher education are *less* likely to have a “high impact” lifestyle. Thus, the effects in Austria, Spain and Turkey have the same direction, which is in line with the above finding from Austria (chapter 3.1) and findings from the aforementioned Canadian study (Kennedy et al., 2015). However, the fact that a contrary effect was shown in Bulgaria and the absence of educational effects in Italy and Norway clearly indicate that national specifics must be taken into account when analysing energy related behaviour. This shows the relevance of a straightforward identification of interesting subgroups, as represented by the selection of the 10% with the largest and smallest impacts in each country.

For the **subjective social status** (which includes both economic and social status), there are **significant effects** on subgroup level **in all six countries**. Respondents with a higher social status are significantly more likely to have an extraordinary high energy impact in Italy, Spain and Turkey. At the same time, in Austria, Bulgaria, Italy, Norway and Turkey, individuals with a higher social status are less likely to have a low impact lifestyle. According to the findings on aggregate level, these results can be related to a long tradition of respective results (Lutzenhiser, 1993; Lutzenhiser and Hackett, 1993; Notter et al., 2013; Kennedy et al., 2015; Moser and Kleinhüchelkotten, 2017). This gives reason to assume that **social status and energy intensity** are **not fully decoupled in any of the countries examined**.

The relationship between **political orientation and energy impact** in **Bulgaria, Norway and Spain** complies with the above mentioned findings from the Canadian study (Kennedy et al., 2015) that found a positive relationship between political orientation and impact: **the further on the right** individuals locate themselves politically, **the higher is their probability of having a high impact lifestyle in Bulgaria, Norway and Spain**.

With regard to supporting the **statement that renewables have positive effects on the environment**, **no significant effects** could be determined for the more extreme “high impact” and “low impact” subgroups, although significant (but opposite) effects were found on aggregate level. The statement that **renewables create new jobs** is significantly associated with an around 1.5 times increased probability of having a high impact lifestyle in **Italy and Spain**.

While there was a significant effect between **believe in climate change** and energy impact at the aggregate level in Norway, such a connection is not apparent when focusing on high or low impact extreme groups. Also with regard to **normative pressure from society**, and **self-efficacy** no effect was found on subgroup level in any of the countries.

With regard to the perceived **personal obligation** to act in an energy-conscious way and to support policies in the sense of the SET-plan, the regression models applied in the first step at aggregate level identified significant relationships with the energy impact in Italy and Spain. The analysis of the high impact and low impact subgroups showed significant effects in **Italy and Norway**, supporting the robustness of the effect in Italy, and suggesting that the relationship between personal obligation and individual energy impact is particularly relevant at the **lower end of the energy consumption spectrum in Norway**. The effects are pointing in the expected direction in both countries. The fact that the effects differ between countries and are not always distributed equally across the spectrum of energy demand again shows how important it is to take a multi-focal view on energy behaviour.

While on aggregate level **environmental identity** was significantly related with energy demand in Austria, it showed a significant positive association with having a **“low impact” lifestyle in Turkey**. For the **intention to support the energy transition**, other than on aggregate level, **no significant effect** was found for the “high” and “low” extreme groups.

In order to assess whether the **acceptance of policy measures** that may increase energy costs for the individual is related to the actual energy intensity of the individual's lifestyle, an index for this form of policy acceptance was additionally used as a predictor in the analysis of the high impact and low impact subgroups. In **Norway**, a higher acceptance of such policy measures is associated with a lower probability of having a low impact lifestyle, which suggests a hypothesis in which the cause-effect relationship is interpreted in the opposite sense: people who already live a “low impact” lifestyle might perceive costly policy interventions as unfair and therefore tend to reject respective measures.

Table 5: Binary logistic regression models for the likelihood of belonging to the 10% of the country sample with the highest or lowest individual lifestyle energy impact. (Only significant effects $p \leq 0.05$ are shown)

		AUSTRIA		BULGARIA		ITALY		NORWAY		SPAIN		TURKEY	
		pseudo R ² high: 0.148 low: 0.135		pseudo R ² high: 0.086 low: 0.080		pseudo R ² high: 0.134 low: 0.148		high: 0.099 low: 0.177		high: 0.133 low: 0.099		high: 0.085 low: 0.180	
Situation	Group	B	Exp(B)	B	Exp(B)	B	Exp(B)	B	Exp(B)	B	Exp(B)	B	Exp(B)
Age category													
Female	High	-.665	.514									.671	1.956
	Low					0.999	2.715			.586	1.798		
Rural environment	High									.826	2.284		
	Low	-.728	.483					-.943	.389				
Household Size	High	-.355	.701			-.318	.600						
	Low	.310	1.363									.486	1.626
Children <14 present	High												
	Low	.685	1.984									-1.168	.311
Higher Education	High			-.766	.465					.985	2.677		
	Low	-.639	.528									-.672	.511
Subj. Social Status	High					.728	2.071			.584	1.793	.379	1.461
	Low	-.448	.639	-.631	.532	-.429	.651	-.745	.475			-.566	.568
Mentality	Group	B	Exp(B)	B	Exp(B)	B	Exp(B)	B	Exp(B)	B	Exp(B)	B	Exp(B)
Political Orientation (high = right)	High			1.350				.239	1.271	.263	1.301		
	Low												
Accept: Renewables good for environment	High												
	Low												
Accept: Renewables create new jobs	High					.416	1.516			.390	1.487		
	Low												
Believe in Climate Change	High												
	Low												
Normative Pressure	High												
	Low												
Self-Efficacy	High												
	Low												
Personal Obligation	High					-.579	.561						
	Low							.666	1.945				
Environmental Identity	High												
	Low											.557	1.746
Intention to support energy transition	High												
	Low												
Support for costly policy interventions	High												
	Low							-.454	.635				

Discussion of quantitative results for “high” and “low” energy lifestyles

In many cases there are effects on the upper and lower limits of the energy intensity spectrum that cannot be detected with linear regression models. However, especially the driving factors that lead to such extraordinarily high or low impacts can be very informative in the search for policy strategies supporting the Energy Transition and the SET-Plan.

The subjective social status is the only driving factor for which significant effects could be shown at subgroup level in *all* six countries. It thus comes closest to the desire for a universal predictor of lifestyle-specific energy impact. However, it must always be kept in mind that all driving factors are *probabilistically* related to the lifestyle energy impact. All models presented herein follow **the aim of identifying effective points of attack for policy interventions or communication strategies**, which means that wherever possible the **complex interplay between seemingly independent areas of life** must be taken into account.

3.2.2. “High” and “low” energy lifestyle focus group discussions in six countries

Can the driving factors in different countries be adequately understood by the quantitative research process alone or are there additional in-depth analyses of more extensive narrations needed? In order to answer this question, focus group discussions in the partner countries were used as a complementary qualitative method. Focus groups explored people’s energy demand caused by their behaviour in different areas of life, which allows a more reliable identification of the driving factors behind different patterns of energy and climate relevant behaviour.

In this chapter, we present the methodological details of the selection of participants and the focus group process itself. Thereafter, the central results providing the individual countries’ perspectives are presented, preserving those accents which, according to the scientific partners in the respective countries best promote the understanding of national specifics. In the subsequent chapter 3.2.3, a cross-national discussion of the focus group results takes place before the links between focus group results and quantitative findings are summarised, and an overview of potential consequences for policy design is given.

Methodology

Selection: To participate in the focus groups, participants from the various partner countries with particularly high and particularly low individual lifestyle energy impact had to be identified. Participants were searched and selected independently from the ECHOES survey, which was running in parallel. Participants were selected on the basis of a short online survey consisting of 10 questions with regard to energy relevant behaviours and equipment use. The invitation to the online survey was distributed via contact networks of the respective ECHOES partners. The responses to the online survey questions should allow a rough estimation of the individual energy impact. Respondents were then ranked with regard to their overall lifestyle energy impact and the individuals with the highest or lowest, respectively, energy impact were invited to the corresponding focus group discussions, without informing them about the group they were in.

In the following these groups are called **HIGH** and **LOW**.

By completing and submitting the online survey, respondents gave their consent to the use of their contact data for the purpose of inviting them to the focus group. On site, a consent form was signed by each participant. It was ensured that the participants remained anonymous throughout the discussions and in the research findings.

All the participants volunteered. No monetary compensation was given to participants. However, to motivate participants, it was suggested to provide a free meal (e.g. coffee, cake) to all participants after the focus group was completed. The focus groups should take place in a quiet, comfortable environment without stress for the participants.

Focus group discussions: Focus group methodology is part of the methodology set used and described in the general ECHOES methodological guidelines. Additionally, a short guideline for “Energy Lifestyle” focus group discussions was established and sent to the partners, proposing the aim, the structure (content framework) and some rules for the discussion groups. Acknowledging cultural differences when talking about the very personal life, and in order to get an optimum of information details, partners had the option to shape the discussions as well as the analysis of the results with a certain freedom.

The discussion developed along the following structure: Discuss four perspectives on the individual's lifestyle consecutively:

Part 1 – Everyday routines: Describe an average weekday along the stages breakfast, going to work, work, lunch, trip back home, evening (if somebody is retired or has currently no job, he/she should describe an average weekday in the present situation!)

Part 2 – Leisure time and vacation: Reflect about their one or two most important leisure activities and make them describe what they especially like about the respective activities.

Part 3 – Life decisions: Reflect about the decision making process that led to their current living situation with regard to the place of residence (also in relation to the place of work & mobility in between) and the type and characteristics of the dwelling/house (space availability, heating/cooling, insulation).

Part 4 - Reflection on energy and climate aspects: What role do energy saving and climate protection play in everyday life, in leisure and holiday activities and for life-decisions? Are the respondents taking concrete action to save energy or reduce their emissions?

(If a focus on electricity emerges mention mobility, heating/cooling, nutrition, consumption etc.). Part 4 should be the only moment where the climate and energy issue should be explicitly mentioned. From the outset, the hint that it was about energy or climate behaviour, should be avoided.

Analysis: For the analysis of the focus groups, partners were asked to summarize the discussion in these four parts, differing and comparing HIGH and LOW group results, and drawing a conclusion.

The Focus group discussions were recorded using audio files and then generally evaluated by two people from each partner team. As mentioned above, partners were free to deepen this methodical approach if requested (e.g. "Thematic analysis approach" described in detail by the partners from Roma3 University, Italy). Therefore some partners transcribed the audio files before the analysis; others evaluated the audio files directly. If direct quotations of the participants were used for the evaluation, this was done under indication of a "participant number".

Austria: „High“ and „Low“ energy lifestyle focus group discussions

Introduction

Recruitment was carried out according to the pre-screening procedure described above. Despite repeated reminders and missing cancellations, only 7 persons (registered 11) participated in the LOW group and only 3 persons (instead of 6) in the HIGH group (since one of them was obviously brought along by another participant and his profile did not correspond to the HIGH score, this person was not included in the evaluation). The HIGH group was composed by persons aged between 30-50, man and woman, employees with higher education. The LOW group consisted of persons aged between 19 and 64, men and women, all of them employees with higher education or students.

The discussion was strongly structured along the three main areas of **everyday routines, leisure time and vacation, life decisions and housing**. At the end, the question of the role of **energy and climate awareness** for behaviour was always raised as a separate chapter. Up to this moment, it was strictly avoided to mention or announce this aspect. Particular attention was paid to asking about the motivation for the respective actions, especially in the area of leisure time and in the area of "energy and climate awareness". In both groups, participants were asked whether they could remember to have consciously renounced an action for energy/ climate reasons. They were also asked to what extent energy-conscious action they had taken was perceived as "renunciation" in the negative sense of "loss".

During the group discussion we observed hardly any interaction between the participants, e.g. through mutual enquiries or comments on statements. The interaction was mainly between JR and individual participants.

Everyday routines

In the HIGH group, mobility behaviour in everyday life was explained in detail and deliberately designed to be as environmentally friendly as possible, i.e. in inner-city areas, with the exception of larger transports, only non-motorised mobility is used. Considering the living situation of the group participants in the inner city and the fact that this part is perfectly accessible by public transport, this mobility choice is obvious here. Walking, but also public transport and short distances are experienced as part of the "enjoyment of urban life". However, as soon as the trips are outside the urban area (leisure trips and holiday trips over short distances), they are made by car.

The majority of the LOW group members follow a regular daily routine. 6 of the 7 people live in the city. One person lives in a community in the surrounding area of the city, but commutes by public transport and takes part in a neighbourly organised walking to school with the children ("walking bus"³). The search for the best possible public connection is common to all; everyone in this group designs the everyday mobility to the study place or workplace without a car, usually in a mix of public transport, cycling and walking. One person must carry out part of her occupational mobility by car (field service). Several participants have had bad experiences with the lack of connection of rural regions to public transport and now appreciate the supply in the big city. What all the participants have in common is that they do not engage in any specifically emission intensive activities in their everyday lives .

³ https://en.wikipedia.org/wiki/Walking_bus (last retrieved: December 12, 2018)

Leisure time and vacation

The HIGH group has a very high emission impact mainly due to their leisure/ holiday mobility behaviour. Intra-European city trips, but also long-haul trips, are undertaken regularly and long-haul trips at least once a year, all by air travel. In addition there are shorter holiday trips by car.

(HIGH1) *When you travel far away, you see how privileged you are here in Austria*

Travelling is a fixed and also an important part of leisure time, because people are looking for new impressions as well as for relaxation. The other (sporting) hobbies in this group are also about challenge and relaxation, they are considered as "passion". These sporting hobbies are also potentially resource-intensive ones (golf, alpine skiing).

In the LOW group, holiday mobility contrasts between group members and differs to all-day mobility routines: 3 people (students) are committed to long distance travel (New Zealand, South America) despite their commitment to environmental protection and budget problems, even if they have to wait a long time and save money. The desire to get to know countries and cultures is decisive, therefore few, but long journeys are preferred. The other 4 persons of this group travel rather little, and if so, then only over short distances and primarily nationally, this is justified by family relations to domestic regions, with environmental reasons and "*Austria is also beautiful*" (LOW 2). These trips are almost exclusively by bike or public transport (1 person with family travels by camper), city trips and cheap flights are rejected. Equal to the HIGH group, travelling is an indispensable part of leisure time (with exception of 1 person). Apart from travelling, the programme also includes socialising with friends, social involvement in clubs, sports (swimming, skiing) and music.

Life decisions

In the HIGH group there was both an example of very generous living (170m² inner-city location for 2 persons) and an example of modest living in a flat "just to sleep there during the working week", but combined with a second home with the family in the countryside. While in the first case living is experienced as part of "indulging oneself" and is indispensable in this quality, in the other case the quality of living has no relevance and is ranked after the need for mobility (flat in optimal traffic situation).

The issue if there was an optimal connection to public transport or not, was the dominant decision criterion for the choice of housing style and the choice of housing location for almost everyone in the LOW group. 2 persons with families from this group live in private homes, whereby this housing situation is "justified" ecologically with a numerous family in the past on the one hand, and with an energy-efficient terraced house on the other hand. In the first case the house had been owned by a large family for decades, and is now to be replaced by a new lowest energy standard building.

Reflection on energy and climate aspects

In the HIGH group, there is a high degree of personal dichotomy between consciousness and action .

(HIGH1) *...so much is damaged in the world, although everyone knows what they're doing and that they're not allowed to do it, it bothers me*

It is striking that there is a high level of awareness of one's own high emissions, above all in the mobility sector, as well as an awareness of the climate impact. At the same time, numerous energy-saving/or even general environmental protection measures recognised as "small" in their effect are taken and mentioned as "compensation" (turning off lights, shopping regionally, separating waste, saving water), whereby it is

acknowledged that not all of these actions are carried out for reasons of climate protection (e.g. regional purchasing for reasons of principle and economic strengthening).

(HIGH2) *At a small scale I do a lot, on the other hand I fly to Australia.*

In spite of everything one admits that – even with bad conscience: *"one lives only once and wants to see the world"*. Interesting is the combination of emission-intensive behaviour and environmental awareness:

(HIGH1) *The consciousness, how precious water is, comes only by travelling far away*

Conscious decisions for environmental reasons happened in this group: once in the form of buying a gasoline car instead of a diesel, once in the form of renouncing consumption (buying less, repairing more). In this case "renunciation" is not experienced negatively, but as a voluntary option, since one has enough anyway. Financial aspects are not influential at all in this group.

The LOW group comprised three employed persons of different ages and four students. Of the 7 persons, five (3 students, 2 employed) orient their actions strongly towards environmental aspects. While the employed (and older) group members orientate themselves towards energy efficiency and climate protection, especially in the field of mobility, the students also state to follow a general trend to orientate their actions more towards "good for people, animals, the environment", which means that fairness in production or reduced meat consumption for animal welfare reasons are equally important.

(LOW3) *What do I need? Sufficiency must not be equated with renunciation*

This statement describes the positioning of this group. The group reflected strongly on sufficiency issues. According to them, the same purpose could also be achieved by different means. What counts are consciously made decisions. First it should be clarified whether there is a need for a product or service and if so, the product should then be as environmentally friendly as possible (energy-saving, durable, repair-friendly) and also produced in a socially fair way. Especially clothes consumption can be very much reduced (also the HIGH Group gave this example!), but also food (low meat consumption).

(LOW1) *The question of whether one needs something decouples consumption from the aspect of whether one can/will spend more or less money on the same product*

Also in this LOW group a certain personal dichotomy is indicated between the desire for long-distance travel and its climate effect, but does not result in any further considerations or compensation ideas. The members of this group are well aware that, compared to other consumers, they are "already well on their way" due to their relatively low consumption, but that, of course, further improved actions would be possible. *"You can act in many small things, like switching off the lights, separating waste, avoiding electronic waste..."*(LOW4) (this is where the action examples of the HIGH and the LOW groups meet). However, the motivation for additional changes is not strong.

Three people mentioned explicitly and as "positive" that they had already been led to modesty in their early youth:

(LOW4) *It is essential to recognize what does you good, many things you don't need*

Financial aspects have a strong influence on action in this group: both in the choice of housing, as well as in the choice of longer journeys, and in general consumer behaviour. They experienced renouncement in the proper sense, however this was - in contrast to group HIGH - mainly for financial reasons.

(LOW2): *If at all I need a mobile phone, then rather save and then buy a Fairphone for around 500€, which is produced socially fair and is repair-friendly, instead of a short-lived cheap mobile phone around 150€.*

(LOW1): *You first have to be able to afford such sustainability. When a mobile phone is really needed, I would however buy the Chinese cheap mobile.*

Summary of focus group results in Austria

The results may be summarized along common themes:

Ethical considerations and environmental awareness: Ethical considerations weigh at least as much in the LOW Group as environmental aspects. In the LOW Group, there is a triangle of influencing aspects: Environment - costs - ethics. Ethics and cost aspects massively control consumption, both in terms of clothing and food (meat consumption, purchase of new clothing): "good for people, animals, the environment", which means that fairness in production or reduced meat consumption for animal welfare reasons are equally important. As far as climate awareness is concerned, both groups are clearly aware of the emission liability of long-haul journeys. But, even for the LOW group, they are still an indispensable part of their lifestyle and do not fall victim to any considerations. The two homeowners in LOW, who justify this with many environmental arguments, are still most likely to show clear climate awareness. Otherwise, the housing situation at LOW is clearly financially conditioned. Environmental awareness is particularly apparent in the form of "repair-friendly, durable" as the desired product characteristic. This has to do with the desire for quality and sufficiency (non-consumption), mentioned below, but hardly with energy/ climate considerations. The HIGH Group does not show any ethical considerations, the extremely high consumption of resources through above all mobility is regretted guiltily, but corresponds to the attitude of life.

Sufficiency vs. consumption: The consumer orientation of society is denounced above all by LOW, mentioned in HIGH and deliberately countered in many examples. However, "sufficiency" is used differently in the LOW and HIGH groups: in HIGH it is above all about voluntary renunciation, similar to a temporary voluntary "fasting", because one could also afford consumption. LOW says that the same purpose could also be achieved by different means. What counts are consciously and responsibly made decisions. Remarkable are the imprints of sufficiency by childhood impressions. Several participants emphasized the childhood and childhood experiences; on the one hand "experiences of lack", which were not experienced negatively (clothing). On the other hand, in the field of mobility this concerns the experience with poor public transport connections and the resulting dependencies on the support by others.

Symbolic action: LOW and HIGH repeatedly described small environmentally friendly activities they do in everyday life, but actions without real relevance for energy/climate problems (turning off lights, shopping regionally, separating waste, saving water). This shows the "willingness" to do something, but relatively unplanned. Of all those surveyed, only one person consciously tried to act energy-consciously (LOW) in all areas of everyday life, including living and mobility, and designed his behaviour according to this principle right up to choosing a place to live. As far as HIGH is concerned, it is striking that there is a high level of awareness of one's own high emissions, above all in the mobility sector, as well as an awareness of the climate impact. At the same time, numerous energy-saving/or even general environmental protection measures recognised as "small" in their effect are taken and mentioned as "compensation". This "compensation idea" does not occur in the LOW Group, although they also set this symbolic action.

Life quality and enjoyment: The conscious enjoyment of the urban atmosphere with good supply, options for shaping one's life (types of housing, food, short distances, transport infrastructure) came out primarily in the HIGH Group, but as for urban mobility also in the LOW Group; associated with this was the possibility of being able to do anything with any type of mobility, to reach all relevant locations. Local environmentally friendly mobility is strongly emphasized by HIGH, but this choice is not made for environmental reasons, but for comfort reasons. As soon as it is not ultra-comfortable, other means of transport are chosen. For HIGH, this also includes that in leisure time and on holidays their needs for "relaxation" on the one hand and "challenge" on the other, are associated with a high demand for mobility. HIGH associates this with "passion" (HIGH1) and for HIGH, frequent travelling is part of its own cultural educational process. Although travel is also mentioned in the LOW group as an indispensable part

of the quality of life, here it is primarily for reasons of getting to know other cultures and travelling is a rare and selective process (which, however, is primarily due to the financial aspect).

No real considerations for a lifestyle change occurred either in the HIGH or in the LOW group.

Driving-factors from a mixed methods perspective: Focus group findings and ECHOES survey results Austria

In the following, the results from the quantitative survey and the qualitative focus group discussions in Austria are brought into relation. The structure is provided by the driving factors that could be identified quantitatively (Table 5), and by the energy impact patterns of the HIGH and LOW energy lifestyle groups visualised in Figure 6.

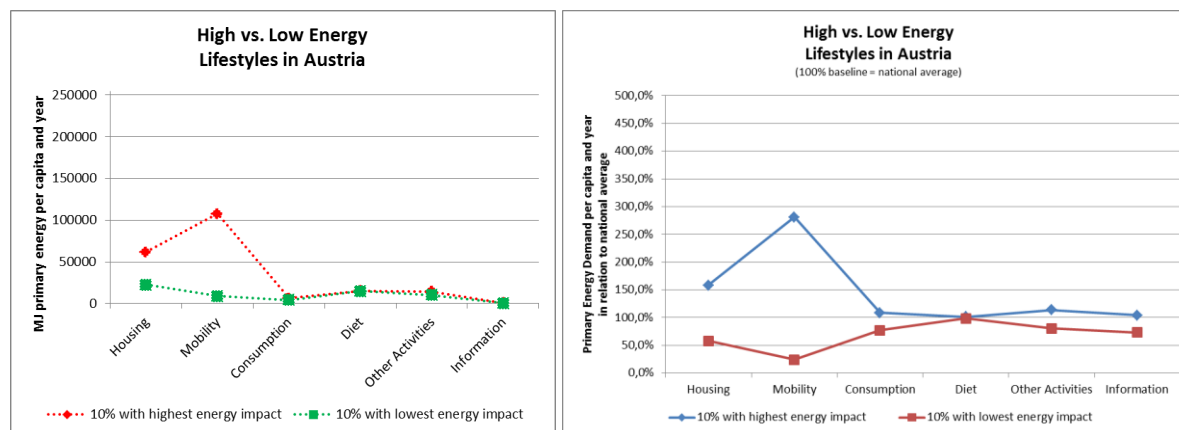


Figure 6: Energy demand profiles of people with HIGH and LOW energy lifestyles in Austria. Absolute values (left) and relative to national average (right).

Driving factors for membership in HIGH group:

Women have a decreased likelihood to be HIGH group members (Odds-Ratio .514)

Driving factors for membership in LOW group:

Rural living environment reduces likelihood to be a LOW group member (Odds-Ratio .483)

Having children under 14 increases likelihood to be a LOW group member (Odds-Ratio 1.984)

Higher Education decreases likelihood to be a LOW group member (Odds-Ratio .528)

A larger number of household members increase the probability for a LOW lifestyle

A higher social status decreases the likelihood to be a LOW group member

Higher Education decreases the likelihood to be a LOW group member

This factor could not be verified in these focus groups due to the composition, size and lack of representativity. In both groups, university educational levels were represented. Since income tends to increase with the level of education, there are financial prerequisites for a high consumption of resources. However, this driving factor identified in the survey is interesting as it shows that a higher level of education does not seem to lead to a resource-intelligent lifestyle.

Women have a decreased likelihood to be HIGH group members

Since the composition of the focus groups has no claim to representativity, this driving factor cannot be confirmed. As there are studies indicating a higher environmental consciousness of women, one hypothesis explaining this finding would be that women also implement their consciousness into practice. Also women often have less available money on average.

Rural living environment reduces likelihood to be a LOW group member

Since all focus group participants live in an urban environment, this driving factor cannot be verified. In general, living in rural areas in Austria means with a high probability high motorised individual traffic (commuters) and living in a detached house. Both are closely linked to the high sprawl of rural areas in Austria and the corresponding poor supply of infrastructure and public transport. In this sense, the survey results are very probable.

Having children under 14 increases the likelihood to be a LOW group member

Since the composition of the focus groups has no claim to representativeness, and since only one focus group member had school-age children, this cannot be confirmed. In general, however, this survey result might be either related to the above (discussed scale effects in housing-related energy use) or to an increased environmental awareness of young parents in Austria, or to the situation that these young families generally try to limit their expenses, also for energy.

A higher social status decreases the likelihood to be a LOW group member

There is a certain parallel of this survey result with "higher education results". Social status might require status symbols that might consist in more energy intense mobility, consumption and housing behavior. In the focus group, the majority of the LOW group consisted of low status persons, while the HIGH group participants had high social status positions.

A larger number of household members increases the probability for a LOW lifestyle

This fact could not be verified in the focus groups, as no participants lived permanently in households with more than 2 persons.

Bulgaria: „High“ and „Low“ energy lifestyle focus group discussions

Introduction

The total number of persons responding to the short online-survey was 151, with only 4 respondents who explicitly rejected further inclusion in the survey despite the completed questionnaire.

Following the guidelines on the focus groups profile, 25 invitations were sent to people with highest energy scores from the online questionnaire to join in the high-energy profile (HIGH) focus group. Respectively, 25 invitations were sent to the people with the lowest scores for the low-energy profile (LOW) focus group. Two of those invited to the HIGH focus group, appeared to live out of Sofia and another two – to be abroad. The final number of the HIGH group participants was 8. There were 6 participants in the LOW focus group.

Two focus groups with overall 14 participants were conducted in Sofia, Bulgaria in October 2018 (one with high energy profile, further referred to as HIGH, on 18/10/2018; and one with low energy profile, further referred as LOW, on 23/10/2018). The HIGH group consisted of 8 participants (4 male and 4 female), covering a variety of ages (from 19 to 65), including students, employees (mainly in the service sector), retired people. Their households consisted of 2-3 people. The LOW group consisted of 6 participants (2 male and 4 female), aged from 26 to 43, 2 students, 1 self-employed, 2 employees from the service sector and a lady on maternity leave. Their households differed: 3 were single people, 2 were households with 2 parents and 1-2 children.

The discussions in the two focus groups followed the structure of the online survey and consecutively addressed the four main topics included there, with an accent on energy needs and consumption - everyday routines, leisure time and vacation, life decisions, and reflections on energy and climate.

Everyday routines

Mobility: The usual distance from home to office was reported by the HIGH group to be about 10 km, car being used where public transport is not convenient and reliable, or when there are children to take to school or to the kindergarten; one participant mentioned that the household had 2 cars. Those who need to overcome more than 10 km in one direction or those with car-based jobs prefer travelling by car to work and back home. Although some of the respondents claimed preferences for travelling by bike, they admit that *“in summer time...that’s a bit of a problem in Sofia”* (R1) because of the lack of infrastructure for biking, air pollution and dust during dry periods. Those with access to reliable public transport (incl. the metro) almost never or rarely use cars. Some of the participants use car only when going outside the city in order to feel more comfortable or when they need to move some bulky luggage. Yet, those who live in remote neighborhoods and have no car, usually travel about one hour in one direction. A high-energy profile does not necessarily relate to everyday car use. Several participants in the HIGH focus group mentioned their preference for walking, especially in the city centre. The availability of time was mentioned as the major factor for choosing to walk. Although the participants in the HIGH focus group were conscious of the impact of car use, they consider it necessary in their everyday life.

(R8) Everyday mobility I do on foot. My standard is 25 min on the go and 25 on the return. I mostly prefer walking. I use a car in the city only in some exceptional situations, in which I have to transport people with difficulties in moving, to buy something and take it home.

(R3) I use it effectively and ecologically, certainly because it is a necessity. I certainly use it very effectively, every day - I need it, that's my job.

The participants in the LOW focus group mainly mentioned walking (about 15 – 20 minutes one direction) and / or using public transport for going to work. Respondents living close to their workplace, prefer walking. One of the participants figured out that in 50 % of the cases he uses the public transport and in the other 50 % - the car (R1). Some have rented their accommodation because of its strategic location and good connections to different places within the city. Some of the participants claimed often using bikes. One admitted that the use of the old family car is an option in a situation of scarce financial resources, rather than purchasing a new one (electric or environment-

friendly). Generally, the LOW group avoids driving in Sofia but keeps the option for car use, especially when traveling out of town and to more remote destinations.

(R2) *I go to work mainly on foot or by the subway, which I also reach by foot for 15 minutes*

(R5) *[I] mostly go on foot. The location of my home and where I usually have tasks makes it possible. And interestingly, living in this place, which I characterize as quite strategic, being close to the center, as I've changed my places of work through the years, this location always allowed me to walk to work. I use public transport very rarely. I sometimes use a bicycle.*

Heating / cooling and home activities: Electricity was mentioned as the main energy source by the participants of the HIGH group. The flat inhabitants of in pre-fab multifamily panel buildings rely on the district heating system. Air conditioning for cooling is not broadly popular yet. The HIGH participants also mentioned various steps undertaken to reduce energy expenses - washing machines and boilers are switched on in the evening; laundry is done between 22.00 pm and 6 am in order to benefit from reduced energy price.

(R2) *In winter we use a lot of energy because we are three people at home. Mostly, all chargers are switched on non-stop*

(R5) *Energy is consumed all day long at home, because we are with boilers and in winter, we are also heating the dwelling on electricity. [...] the heating is in some sense clever, because it has the sensors and the other things that count when certain temperature is reached*

(R8) *At home we are mainly on electricity. In winter we have a district heating system, i.e. we do not use other sources of energy*

The main heating sources mentioned by the LOW group were electricity (sometimes combined with gas), and district heating. Some of the respondents have undertaken action to adapt the central heating system to their daily routine. Domestic energy is used in the evening for TV sets and computers. A household with children has stopped using the TV, *"because children do their homework or play with slimes and constructors"* (R4). Air conditioners are not very popular.

Food and cooking: No explicit preferences were mentioned in the HIGH group about the food consumed; some participants mentioned cooking at home in the evening (and preparing a lunch box at home for the next day) but also visiting cafes and restaurants close to the office during the day. Evening food is sometimes alternatively bought from suppliers, restaurants close by, etc. Students usually have their lunch "to go". "Households with children have changed their habits and daily routines, e.g. started to cook in the morning and providing fresh lunch for the children at home. For LOW, energy use at home depends on the daily routine and the freedom to schedule it. Some of the respondents have breakfast at home, others prefer to buy something cooked for breakfast. Some of the participants use to have lunch at a restaurant. For those who do not cook, salad with some appetizers and then sandwiches are the preferred lunch menu. For the freelancers and those on floating working time *"the lunch depends on whether I decide to spend the morning at home, or to work outside"* (R5). Things completely change when children come: One participant explicitly mentioned preparing food and eating at home as a way to saving resources:

(R6) *I very much like the idea of preparing food in a natural way on wood. But for now, I do not do this, because I do not like the smell of smoke. I'm thinking about how to do it. I now cook on gas. I eat mostly at home because I do not like the idea of wasting resources*

(R1) *[Evening cooking], of course, is a must.*

(R3) *I'm currently on maternity leave and the daily routine is totally different Now we cook everyday at home, even though we order the food for the little one.... We accepted and still accept many guests at home, so there's still cooking in the evening.*

Working: The daily energy consumption for those HIGH working at home (or with flexible working schedule) is related to using domestic appliances as refrigerator, coffee machine and TV set. Regardless of the workplace (office or home) the devices necessary to perform the main working activities, as computers and mobile devices, contribute to the increased energy consumption. Those who take care of children at home, estimate that they consume a lot of energy. As for LOW, the energy for working could be used at home or in the office.

The computer seemed to be the device often switched on all the time: "The energy at the workplace is needed for laptops, computer equipment, and other technical devices".

(R5) Surely the computer is the only thing that is switched on during the whole day and often in the evening. Turning on the computer, whether I'm staying at home or leaving, is a fact"

Leisure time and vacation

A variety of leisure patterns were mentioned in the HIGH group. Winter and summer were equally preferred for leisure time and vacations. HIGH participants mentioned camping in the mountains and at the seaside, and flights to various destinations in Europe and beyond, in the summer season. Some participants enjoy travelling by car to the seashore (Black Sea) and visiting close relatives or renting a villa. Others relate summer holidays with emotions.

One of the aging participants shared that the family had bought a vacation flat at the Black Sea coast. Mountain tourism and hiking are also practised in summer, the destinations being reached by car. One of the participants shared that he had never travelled by air abroad (R4). HIGH participants mentioned going by car to skiing destinations abroad (Austria, Italy) and in Bulgaria as a usual winter vacation, practised for many years. A participant said that he usually goes skiing in Bulgaria at least twice during the winter season. The winter season was considered by one of the participants as the right time for flying to distant destinations (in Europe and even the USA and for exotic trips (to Australia and China)).

Car trips in Bulgaria and nearby countries or weekend airplane destinations across Europe are undertaken during mid-season breaks and weekends. Weekend family reunions and meetings with relatives in the mountains and visiting family houses in rural areas (usually maintained as inherited "second home" property) are also very popular among the participants. Some of the participants rather preferred a variety of options, practised several times throughout a year. The same participant claimed that shifting from car to train trips "at the request of the younger generation" was also an enjoyable experience: "The first time travelling by train was a bit emotional, but it's not scary. It has now become a pleasant custom, and we often use it." Far-away destinations abroad are usually reached by plane and a car is hired on-site by one of the respondents. The main driving factors for choosing the vehicle to use are the distance and the time frame.

(R4) Skiing....it is very energy intensive. A lot of energy is used to make it happen

(R1) During the summer season we go camping, in the winter – to the mountain. Car trips in Bulgaria and nearby countries or weekend airplane destinations across Europe. In winter we go skiing, which is still connected with a trip by car. Mostly in Austria, and so for more than 10 years

(R5)in the summer somewhere at sea. And to me the sea relates to a beach, a book, a horizon. It may be wild, in general every time it is different. It is also connected by car, by plane

(R2) In summer - to the sea by car, we have close relatives there.

(R6) ... hotels, houses, camping, skiing in winter. In winter at least two times, and in summer - more often

The respondents in the LOW focus group also distinguished two seasons for vacations and active recreation – winter and summer. For some of the participants winter leisure is usually around Christmas and New Year, a few

days which they spend with their families in their hometown or in Sofia. During the weekends, or covering a one-week vacation, skiing in winter is popular and usually related to car driving and travelling with a group of friends or family members (including children). The preferred skiing destinations are in Bulgaria, but also abroad (destinations reached by car). For those who do not practise winter sports, there are two types of vacation: shorter, usually in Bulgaria by train or bus, and longer ones, usually by plane and being planned at the beginning of the year. Cultural tourism is sometimes opposed to or combined with rural tourism and hiking.

Summertime vacations are organized around travelling by car to the seaside and camping either along the Black sea coast or in Greece. Some participants would rather combine sea and mountain tourism. Travelling by plane happens rarely, for some of the participants only once in a lifetime or once a year, for others it never happened yet. Usually participants travel by bus or train. A sleeping compartment is sometimes a preferred option for long distance trips by train in the country. Car sharing as preferred option was mentioned by two of the participants, because of the possibility to share expenses for gasoline and take some luggage. One of the participants usually joins organized excursions by bus. Another participant is shifting from hitchhiking to car driving in search for personal independence than in organized mobility.

Weekend recreation with the family members is almost impossible for some of the participants as they (or their relatives) are always busy. Short breaks during the year are also connected to visiting birthplace/hometowns and maintenance of property/'second home' there. Big urban/peri-urban parks within the walking distance or served by public transport are also mentioned as an alternative to travelling to the mountains.

(R6) I'm generally a hitchhiker ... Now I want to drive, precisely because, despite my greatest desire to live energy efficiently, just the situation in public intercity transport terribly disturbs me. This is something very hard for me and I want to be truly independent and unimpeded with all this".

(R3) We are both skiers with my husband and we often go abroad and in Bulgaria, including Saturdays and Sundays, and for a whole week. Going to the sea is only in Greece, we have given up our Black Sea coast. We go only in Greece. Even this summer, with the little kid we went there, by car. This year we traveled a lot by plane. We went to Hungary, Italy, the three of us, it was not a problem."

Life decisions

All the respondents in the HIGH group lived in privately-owned accommodation. Six of them have not chosen their dwellings, they live in the properties owned by their parents or inherited from them:

Three of them shared that if they had to choose, they would rather prefer living elsewhere, yet the considerations were rather related to the location and the environmental quality than to energy aspects. There was only one respondent who was satisfied with the family dwelling and has chosen to stay because of emotional reasons but also location and some considerations related to energy saving. Most of the respondents mentioned that either some insulation or energy-saving measures have been already undertaken in their dwellings or that no additional insulation was considered necessary for the moment.

(R1) Just the family had these apartments. ... I chose to stay there because my parents put things in that way – me to stay there, so that they are not very far away

(R3) ... an apartment because it is much easier to maintain than a house; somewhere closer to transport, to be more connected to the city, rather in the city centre.

(R6) We live in a panel apartment, in a neighborhood near a metro station. This is the apartment I grew up in, and I decided to stay there, because some trees planted from my childhood now became huge and very beautiful. And in summer there is no real need of cooling. It is extremely cool and pleasant apartment. And I asked my parents to move.

(R7) I live in an apartment, brick block of flats with good insulation. In principle, the quality of the bricks is such, that there is no need to isolate them. We are on central heating; we do not have air conditioners

The expressed satisfaction of LOW respondents with one's dwelling is mainly related to the location but also to reasonable expenses for maintaining it. One participant was strongly dissatisfied with her dwelling because of being far away from the city centre and with no available transport. The choices made on dwellings had been related mainly to their location and the proximity (preferably walking distance) to one's workplace, or to the good connectivity to urban transport. The location has been an important factor even in case of home-based working.

Additional considerations concern the overall quality of the urban environment. When discussing the place of energy considerations in their life decisions, the participants confessed that it has not been a priority in most cases. One participant was very proud of the numerous smart energy-saving measures he had implemented in his home. Although not usually undertaking explicit calculations, another participant claimed to be generally sensitive to the need for using energy in a reasonable way.

Some attempts were also mentioned for balancing various considerations and prioritizing care for the environment.

Some participants expressed their dissatisfaction with the inconveniences resulting from the energy saving measures promoted and implemented: Cycling was considered an option to replace car trips in the city (R6), yet it was not considered appropriate in some life situations. Some participants shared personal experience about life situations when energy saving was not prioritized, others expressed their considerations about the need to reasonably estimate the limits of saving energy when guaranteeing normal life conditions:

(R4) I have put energy saving bulbs everywhere. I've also put in shutters on the doors to shut because that's what I think the smart systems which are set for heating - if the doors are not shut, they do not make sense. I think to put motion sensors for the lamps to switch off when forgotten

(R1) I very often prefer the convenience before saving energy. If I have to go somewhere on foot and it will take me 50 minutes, I'd rather go with a vehicle.

(R5) I am satisfied with the dwelling, mainly as a location. It's small, but this, on the other hand, has the positive effect that it is easier to manage and less costs are needed, including heating

(R6) At home, the energy bulbs are among the most economic class, but to tell you honestly it is dark to me. And I spent once maybe 15 minutes in the store looking at bulbs, unable to decide how to act

(R3) Oh, no, I'm from a profession after all, I cannot appear all sweated at meetings, there's no way

(R1) I reach work for about 15-20 minutes on foot, which is ideal. Currently the prices are very high in this area around the center. I think we will not think of moving soon. It must be a communicative place, and to be OK with the urban transport

(R2) ... it was near the metro, the tram, the bus, and it was in the broad center and it was close to my work. So, I decided to rent the dwelling. In a block, prefabricated, built somewhere in the 50-60s. The neighborhood itself was exactly the old preserved look of the complexes which means there are green spaces, there is a parking lot, there are playgrounds, sports grounds.

(R3) Saving energy is absolutely impossible in winter because we cannot stay in cold. I cannot stop cooking and start serving raw food. The only thing I still support is that I try and keep insisting that I do not want to drive and continue to use the urban transport as much as I can.

Reflection on energy and climate aspects

The participants of the HIGH group were aware of the importance of economic aspects in energy-related considerations: Some were quite pessimistic about the capacity of Bulgarian families to work towards decreasing the national energy dependence.

A growing awareness was also expressed about the importance of saving natural resources. Yet, the participants also appreciated the complexities of real-life situations and insisted on properly weighing all the costs and benefits of using and saving.

A number of existing contradictions between energy saving imperatives and health requirements were also outlined: Time was several times mentioned as an important factor in deciding on how to move in the city: A major barrier to responsible energy-related behaviour was seen in the lack of consistent public policy on energy management: Some participants acknowledged using a lot of energy, yet they considered that to be a necessary condition for their everyday life and claimed they had been trying to compensate that by avoiding plastic bags and packed food, and by efficiently using their cars and implementing smart heating device.

(R6) At home we save electricity because we think that's right. Not for financial reasons. They matter, but not to such an extent

(R5) I've been trying to ride a bike. The last time I came home by bicycle, ... I could not wash my skin. And that's what we are breathing. I do not like this and I take the car with absolutely no scruples because I think my health is more important. I also take the kids ...).

(R5) If I had time, I would walk - not because of the energy saving but because of my own experience, that I move and spend my own energy that I am looking to spend

(R8) I've been trying to get around with public transport, but I'm getting much slower than with my car.

(R1) In my opinion, saving energy in 90% of people is related to saving money, the financial side of things matters most

(R2) From time to time, I have thoughts that are in the direction of the exhaustible resources. Rather, I say, I save water more than anything else.

(R8) Somehow your motivation to save energy is killed instantly as you pass through the surrounding urban space and you see what the public authorities do with this energy. And then, somehow you start wondering if you have to put out the lamps and if there is any sense in the whole thing.

The participants in the LOW focus group outlined shortcomings in the organization of public transport reducing the comfort of using it and motivating the use of individual transport. The appearance of the first electric cars in Sofia was not considered a real alternative for improving the transport situation in the city

(R6) Why do I take driving lessons? Now I want to drive, precisely because, despite my greatest desire to live energy efficiently, just the situation in public intercity transport terribly disturbs me. This is something very hard for me and I want to be truly independent.

Summary of focus group results in Bulgaria

There are general similarities among the HIGH and LOW focus groups:

1: Flexibility of the everyday routine, changing patterns depending on working; computers everywhere; prevailing electricity sources used; evening cooking at home. Cooling is regarded important in the hot summer season, yet participants in all the groups rather preferred to rely on other means (shading, insulation, etc.). Walking is preferred by all the participants, yet in the city it is too time-consuming; public transport is not always considered very convenient, cars are estimated to provide more comfort; they are needed for going out of the city.

2: In both groups participants shared they enjoy both summer and winter vacation. Going to the sea in summertime together with friends is also a common and enjoyable practice.

3: Some life decisions had been strongly predetermined – in situations depending on inherited family dwellings and private property ownership, which is in Bulgaria a very high share; people who have rented their dwellings felt more flexible to decide upon location. Energy considerations have not played a major role in choosing an apartment, yet most of the participants have appreciated the positive side of jointly undertaking action for increasing the energy efficiency in multifamily buildings.

4: There was a general awareness expressed by the respondents about the importance of reasonably using natural resources, yet it was difficult for most of them to refrain from certain comfort or to compromise with health considerations.

In addition, there are some peculiarities of the focus groups:

1: More traditional family-life patterns seem to be kept alive in the countryside, yet also gradually changing; the traditional gathering of the family for the evening meal was several times mentioned as an important daily ritual of sharing the experience of the day with family members.

2: Skiing seems not as popular among the participants from the countryside as it is among the participants in the two focus groups in Sofia;

Driving-factors from a mixed methods perspective: Focus group findings and ECHOES survey results Bulgaria

In the following, the results from the quantitative survey and the qualitative focus group discussions in Bulgaria are brought into relation. The structure is provided by the driving factors that could be identified quantitatively, and by the energy impact patterns of the HIGH and LOW energy lifestyle groups visualised in Figure 7.

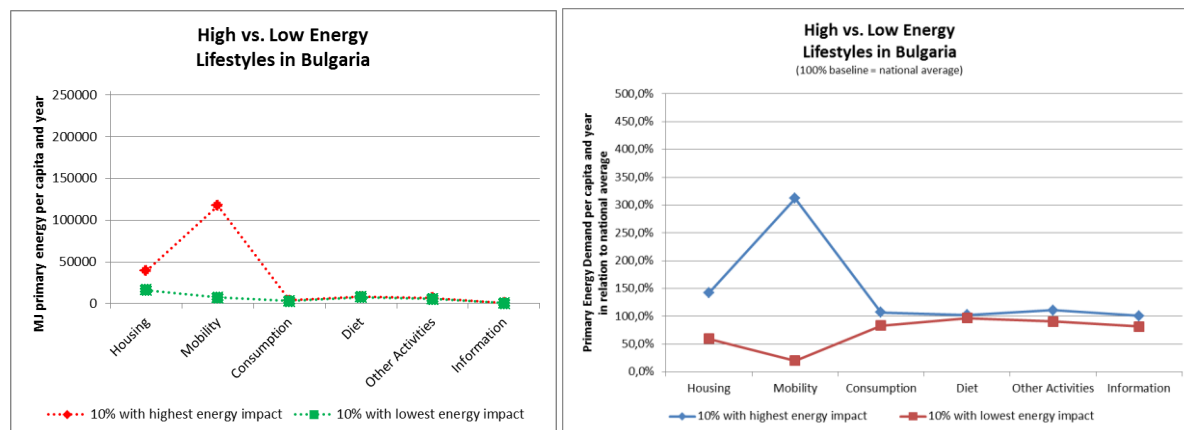


Figure 7: Energy demand profiles of people with HIGH and LOW energy lifestyles in Bulgaria. Absolute values (left) and relative to national average (right).

Driving factors for membership in HIGH group:

Right political orientation increases the likelihood to be a HIGH group member

Higher education decreases the probability to belong to the HIGH group (Odds-Ratio .465)

Driving factors for membership in LOW group:

People with a higher social status have a smaller likelihood to be LOW group members

Right political orientation increases the likelihood to be a HIGH group member

That quantitative finding would surely need deeper research for further clarification about political orientations. Issues of political orientation were not explicitly discussed during the focus groups. Due to the peculiarities of the transition process after 1990 the classical political spectrum is hardly relevant under the present Bulgarian context. Bulgarian society is still deeply divided with regard to estimations of the past.

A higher number of households members increases the chance of being a LOW group member

That hypothesis needs further study. All respondents in Sofia were from households with 1 to 4 members.

A higher social status decreases the chance of being a LOW group member

More intensive and broader social contacts motivate a more dynamic lifestyle with an increased number of leisure trips and activities abroad; an increased number of short-term flight trips to international events as part of one's duties is also observed.

Higher education decreases the probability to belong to the HIGH group

This effect was observed exclusively in Bulgaria and could not be confirmed by the focus group. It would be interesting to study this group in depth.

Italy: „High“ and „Low“ energy lifestyle focus group discussions

Introduction

This chapter summarizes Italian focus group findings. Two semi-structured focus groups, lasting about 2-hour each, were conducted in October 2018. The focus groups were moderated by a moderator and an assistant moderator. The first focus group consisted of 6 participants (2 males, 4 females) aged from 37 to 59 with a maximum age difference of 22 years within one group. It was representative of the HIGH group, as assessed through the online questionnaire. The second focus group was formed by 5 participants (1 male and 4 females) aged from 27 to 47 with a maximum age difference of 30 years. Participants in this second group were representative of the LOW people. None of the participants was informed about the characteristics of the group they belong to (High vs Low). The focus groups all took part in Rome Tre University as this is a natural environment for the participants. The focus groups were carried out in study rooms that had been booked for the purpose of the focus groups, this meant that there were no distractions throughout the duration of the focus group. The focus groups duration varied between 60-90 minutes.

To analyse and integrate the data collected in this study, a thematic analysis approach was adopted. Thematic analysis is the process of identifying analysing, and reporting patterns (themes) within qualitative data. Focus group discussions were transcribed verbatim and were analysed using an inductive approach. To ensure a better reliability of the results obtained, a cross-check of the interpretations by two independent researchers was implemented. The use of two independent researchers who identify the categories and assign different fragments of the text to different themes certainly makes the result of the analysis more reliable. In the current study, focus group interviews were analysed by the following steps:

- Become familiar with the data: the first step in any qualitative analysis is reading and re-reading the transcripts.
- Selection of the subtext: relevant texts or parts of the focus groups interviews were selected for each section of “Energy Lifestyle” Focus Group Discussions track.
- Generate initial codes: in this phase data were organized in a meaningful and systematic way
- Search for themes: we examined the codes and some of them clearly fitted together into a theme. As defined earlier, a theme is a pattern that captures something significant or interesting about the data and/or research question. As Braun & Clarke (2006) explain, there are no hard and fast rules about what makes a theme. A theme is characterized by its significance.
- Review themes: we examined if themes were coherent and they were distinct from each other
- Define themes: a final refinement of the themes was necessary in order to “*identify the ‘essence’ of what each theme is about*” (Braun & Clarke, 2006, p.92).
- Writing-up: two independent reports on the results of the transcription of the focus group discussions were fulfilled. Some sentences or sections of text were processed descriptively, to generate a coherent representation of the contents.
- Cross-check of the themes and interpretations identified by both researchers

In each section of the “Energy Lifestyle” Focus Group Discussions track, **common themes** emerged for both groups. The issue of the role of the public administration and the legislative norms is an exception, and will be clarified in the following sections.

In general, the following themes have been identified, described and analysed for each section.

EVERYDAY ROUTINES

- Comfort and Personal Convenience
- Sense of Community
- Awareness of Consumption and the Role of Economic Impact on People
- A Feeling of Helplessness
- Cultural Heritage – Cross Generation Education
- Public Administration Role

LEISURE TIME AND VACATION

- Comfort
- Sustainable Behaviours on Holiday

LIFE DECISIONS

- Sustainable Behaviours at home
- Economic Barriers
- Lack or Limited Availability of Incentives

CONSIDERATION ON GLOBAL ENERGY AND CLIMATE ISSUES

- Global Warming
- Legislation
- The Role of Information and Education

EVERYDAY ROUTINES

Comfort and Personal Convenience: all choices, sustainable or not, especially concerning transport, for both groups have been mostly established out of comfort and personal convenience. The LOW group stands out because of a greater and more detailed attention to energy saving actions, ranging from eating habits to the use of transport and electricity consumption. The environmental aspects and the proposals to live in a rural context seem to have greater impact on the lifestyle of people with low energy lifestyle that have been interviewed.

HIGH: (Participant 1) *It seems to me that the most virtuous individuals are those who seem to be less affected being so...? So those living close to their work site, that do not love their car, driving, that are very distressing, those that instead, maybe, here's why... This is an important consideration in my opinion. The moment when someone becomes virtuous means that he/she is giving up something that is **comfortable**, that is liked or that anyway wouldn't want, in my opinion none of us is that virtuous.*

(Participant 4) *I am not that satisfied of my sustainable behaviour, even if I think of it, but most likely that is due to my habits or being **comfortable**...*

(Participant 6) *I have a very virtuous behaviour in transport, but not due to my huge sensitivity, but because that is the most **comfortable** thing, meaning that we are lucky to live at 2 train stops distance from where I work, so it is 6 minutes, I do not have to look for parking, I just board a train and disembark from it. [...] Just like when I take a shower, I don't know, I turn the faucet on, I won't turn it off while I am soaping up, then open it again, I leave it on all the time I need it. Let's say that, concerning water usage, something better could be done, but I act like that because it is more comfortable, and I do not think about it, that is much more **convenient**.*

(Participant 3) *Anybody is virtuous doing those things that would cost less and instead let himself/herself go on things that are more liked or that cost more.*

LOW: (Participant 3) *I use public transport because, in my opinion, **in Rome public transport is very comfortable**, probably also because the places I have to visit are very close to the subway, they are quite easy to reach, and I consider it being quite **comfortable**, therefore ultimately I mostly travel using public transport.*

(Participant 2) Summer typical situation: air conditioner turned on with open window. – just for **comfort**. It is much easier to keep the window open rather than adjust the air conditioner, in the 8 working hours it is like that...

(Participant 1) our village is flat so it is **convenient** to use the bicycle and, I must be honest, I am not using the bike all the time [...] therefore if I have to move to the study it is ok, but if it is raining I will use my car, especially if I have also go grocery shopping and buying stuff for the house, because my time is always quite short, so going around with my bike it is a bit more demanding.

Sense of Community: for both groups, the behaviour that we adopt could also be affected by the community we are living in. The HIGH group is affected by the lack of a sense of community and lack social support that could be sharing the sustainable goals and lead their decisions to adopt a more sustainable lifestyle, in turn influencing an individual sense of responsibility. In the LOW group being part of a community helps to support sustainable choices even subconsciously in various fields.

HIGH (Participant 6) We can say, for sure, that being inside **a community** that behaves in some way will prompt people to behave in a certain manner.

(Participant 4) I am thinking of my condominium, we have never succeeded even to find some room for the bicycles (...), basic things.

(Participant 5) Maybe if some common feeling would exist on such matters, we would be able to do something more.

(Participant 4) A **community** that is working to that end having a goal, because there is no such... At a personal level I believe in a large part of people does exist the awareness to adopt such behaviours, I think that is quite common, however at the general level I think we have to go looking for some virtuous behaviour, I don't know, when you are grocery shopping.

(Participant 1) I believe that right in our social life we should retrieve a bit of responsibility for all what we are doing, at least because we are living in a **community** and thus the sense of responsibility, I believe could help many people and be that the case it could even improve a bit our choices.

LOW (Participant 1) We are a **peasant community**; thus, everything is zero kilometre. My parents are peasants as well, so I am not buying many things and we have a shorter chain, so about eating we focus on our benefits rather than on energy consumption saving, I acknowledge that.

(Participant 5) It is difficult for a single individual to do something because when you are working you are just focused in doing that, trying to live because nowadays instead you have to try to survive, you have no desire nor strength to search for information... **when you are part of a group, a whole village**, if there is someone that is helping you to move towards a simpler world, a way that helps you saving...

(Participant 4) A trusted person tells you: "Look, **we are all together doing like that**, if we act like that altogether we will really create something good" ... people will do so much more willingly.

Awareness of consumption and the role of economic impact on people: in both groups, the role that the economic factor plays in the choice of adopting a more sustainable energy lifestyle clearly emerges. In the **HIGH** group, the economic factor is related to the lack of awareness with regards to the expenses made by the individual. A stronger direct control of the expenses could lead towards a more sustainable energy lifestyle. In the **LOW** group, the economic factor is perceived like a constraint or like a concrete crucial factor.

HIGH (Participant 6) The fact of **having a greater control of consumption**, even from an economic point of view, we have the bills, the bill come, and we do not know how much we are consuming

(Participant 2) the **economic threshold** is also limiting a bit with regards to what you are consuming.

(Participant 6) Someone can say even out of a merely **economical reason** for this month I would like to spend a bit less, or this year I want to spend a bit less.

LOW (Participant 2) I found out that I go for sustainability despite myself, meaning that I have realized that my sustainability approach comes from a simple **economic factor**, since I cannot afford some things my choices are dictated that way.

(Participant 4) When I found that I could not have afforded that, and I discovered the **economic benefit** in preparing my lunch I started opting that way.

(Participant 3) Because saving energy and all the rest also represents an **economic factor**, therefore it would be much pleasant if everyone would do so

Feelings of helplessness: a sense of *helplessness* of the actions carried out by an individual is quite common. The perception is that there is no feedback for what we do in terms of sustainability. The lack of a sense of community that would act as a driver to implement and maintain more sustainable behaviours at energy level comes out in this concept as well. Moreover, there is no feedback on the impact that individual and collective actions may have on energy saving and overall on the environment. In the HIGH group, the sense of helplessness turns into the renounce and abandonment of sustainable behaviours, while in the LOW group it turns into discouragement.

HIGH (Participant 4) We feel, this **feeling of powerlessness**, ultimately comes out...will it be useful to have waste sorting that we painfully do? **No feedback is provided.**

(Participant 5) **You do not feel being part of a community** ... A community that is working in that sense with a goal.

LOW (Participant 3) In Rome even if it is a bit difficult I try to recycle, or better it is not difficult, it is easy at home, but then you go into the street aiming at separate things and **you soon lose that will to separate waste not to lose too much time** because then you notice when the truck comes it will collect everything together...

(Participant 2) In smaller municipalities, that are promising that with curbside collection you would get tax reductions, some kind of saving... **and you won't notice that.**

(Participant 3) **This way the mass is being demoralised**, people get demoralised and **lose the desire they had to change things.**

Cultural heritage – Cross generation education: an aspect that arises clearly and that seems to be shared by the high energy lifestyle group concerns the influence that previous generations habits may have had regarding the adoption more or less spontaneous of sustainable behaviours.

HIGH (Participant 3) For good or bad we all were born in an age where there was well-being, consequently having appliances, machines, lots of things were fundamentally symbols of this well-being that **have been provided by our parents** who were buying, purchasing, because doing so was also a way to claim economic and social conquests, therefore we have done many things until now spontaneously.

(Participant 3) It is just a **matter of education, even cultural education**, because we are going from adopting another way to relate to our lifestyle. However, I think that it is all a matter that needs some time, because it requires a change, with regards to something we have been instructed to follow, even if with no negative intent...

(Participant 6) **they did inculcate them to us** and thus slowly, in an almost subconscious way we will implement them.

LOW (Participant 4) In reality I believe that maybe it is stemming from a **culture** I got from when I was a child and so I always pay attention to turn off the light in the rooms where there is nobody, never leaving water running.

(Participant 1) I do believe, however, that this is a **cultural matter**, how your habits are, how you have been brought up and what you have experienced

(Participant 3) Because teaching people 80, 60 and even 40 years old today is not that easy, then **you will never inculcate them a mentality they never had**

Public Administration Role: Both groups complain that sustainable behaviours seem to be mostly assigned to a single citizen since, with regards to energy, clear and effective political and social strategies are missing. However, this is a theme that emerges in different sections between the groups. The male participants of HIGH group discuss in particular this aspect, considering the issue of habits in everyday life

HIGH (Participant 1) In my opinion, **a lot depends from the political, social strategies that a nation has adopted. It is not right to assign a single citizen** the duty to reduce consumptions or change somehow his/her habits. Any single citizen will do so if he/she will be into a context where is being pushed to do so.

(Participant 1) **I have always had the doubt** that all the proposals concerning solar panels, new technologies and so on, would mainly have economic and businesses investment grounds rather than having any social nature or coming from a real strategy, and once you have this doubt, that can also be misleading, for sure you do not have any stimulus to act in order to improve things ...? You may be thinking that **many people are speculating on energy, on consumption**, on such possibilities.

(Participant 6) To this effect having some rules, government or even municipal policies...local ones, with some **rules that if you do not comply to you will be punished, somehow will prompt you** ...If you do not have that, somehow it must be instilled into you.

(Participant 1) **Our country's energy policies have not been virtuous for sure** in general and for sure they have not encouraged any single citizen to behave with virtuosity, I would argue the other way around.

Leisure time and vacation

Comfort: people adopt behaviours and make choices more or less sustainable based upon comfort and convenience aspects as well as personal needs, on leisure time and vacations as well. The choice of mode of transport is also due to the need of comfort. Among the representatives of the HIGH group the tendency to use their own car or the airplane is greater, while in the LOW group the preference is mainly on using train and bicycle.

HIGH (Participant 2) Basically me too, when going in vacation, always have a choice based upon **comfort**. In vacation anyone wants to be quite relaxed and calm, so the last of my thoughts is this, therefore I will use less my car unless I will have due to a different choice, you aim to have a vacation in touch with nature and then you will adjust yourself consequently, using the bicycle, walking, however not due to a free choice, but always influenced by a personal need.

(Participant 6) To move you are using the transport mode you believe is more **comfortable**, in your vacation days you want to be self-sufficient setting up the transport mode a bit based upon that...

(Participant 3) what I believe have a major impact on my vacation are the kilometres travelled in my car because we are anyway moving going somewhere else and we are going usually by car therefore that is the reason we are no longer sustainable.

LOW (Participant 4) Because I like it as a transport mode, [train] I see it much more **comfortable** than airplane... airplane is not that comfortable like a train... it is obvious that if I have to go to the other side of the world I won't be able to use a train

(Participant 5) vacations and free time total inactivity, therefore with no energy consumption. [...] staying outside, walking, doing so it would really be possible to save a lot

(Participant 1) Lately on my vacations no car, it is something that is frankly happening to me... maybe going in a car gets me tired, for this factor using a car has been discontinued.

Sustainable Behaviours on Holiday: for the HIGH group, on holiday it is considered harder to maintain or adopt a sustainable lifestyle, while for the LOW group representatives it is perceived to be easier. The vacation place features and norms are also perceived as having a significant impact on personal behaviour.

HIGH (Participant 3) I do not decide to go somewhere because I know energy saving will be more sustainable there.

(Participant 1) What I do find **more difficult to do** on vacation with regards to everyday life is **having less consumption**, buying less things, when I go on vacation I am used to squander more easily, when I am home I have a tendency to deeply evaluate if I really need one thing, if I have to purchase it, another T-shirt or another pair of shoes ... Instead when you are on vacation, you will lose a bit of inhibition on that...this, in my opinion, will have an ultimate impact, why could seem to you that buying 4 T-shirts instead of 1 will matter more? However, 4 T-shirts have to be produced: at first you have to produce them, then they have been produced on their side of the world, so they have to be delivered...

(Participant 2) some markers even exterior ones have to be set, so if I have the tendency to have a more virtuous behaviour because that is the custom there I will, however it won't happen because I am going there with such intent.

(Participant 3) What I have noticed is that once you are home, compared to when you live in a hotel you have the tendency to manage your consumptions differently, at home you will get the bill, in the hotel you have already paid, either if you turn on or off the lights, if the water is running or not, if the air conditioning is on or not, it won't matter...

LOW (Participant 4) In my free time is when I am able to run my life a bit more...That at time subconsciously you make a choice instead of another one without realizing that, so it will be more in your free time that I will be free to choose. **I will do some things that go into a slightly more sustainable direction**, maybe because intrinsically inside me I have the intention to do things that won't pollute anything...

(Participant 1) Making reference to a holiday had in Denmark in particular to the characteristic use of bicycles in the city) an idea that is being inculcated by politics too, it is not just my personal choice. If you will provide the opportunity to choose, I will go for a **sustainable option**, I will chose to move which will then have an impact on my physical health, on many other things.

LIFE DECISIONS

House Sustainable Behavior: Only a participant of the LOW group seems to have taken into consideration the possibility to make sustainable energy choices and implement measures concerning the evaluation of the dwelling unit. In both groups, there is a reference to the choice of the low consumption appliances. However, in the HIGH group, this choice is more connected to economic saving than to environmental impact. This indicates a tendency to relieve responsibility from personal choices and to forward them towards the external variables, as well as to policy makers that should have an economic, social and political responsibility with regards to the citizen in this field.

HIGH (Participant 2) *I think of absolutely personal choices, due to the place where we have been brought up, due to the desire to remain in an area you like, but certainly **not due to any virtuous behavior** or because of having selected areas that are particularly at the cutting edge under this point of view.*

(Participant 6) *a **low consumption appliance**, you will probably buy it for energy saving reasons but also **because it will make you save something money wise.***

(Participant 1) *when I bought my apartment **I did not chose it based upon this criteria**, absolutely, but based upon its comfort, being closer to home, to my work place, maybe to the area I had lived, where I liked it the most [...] I live in a house I like a lot, a small villa, **I have all the comforts, I can have large consumptions, too***

(Participant 5) *I am going to purchase the **appliance that will allow me to have a lower energy consumption**, however, it is also a matter of disposing the old appliances and keep on producing low consumption appliances so where is the convenience? We are however encouraging an industrial production*

LOW (Participant 2) *I can claim that when we bought our home where actually my mother is living **the fact that there were solar panels connected to the heating system has represented an important factor**, especially for us that come from having electrical water heaters so... **it has been a pleasure to actually see how much we did save**, the fact of saying I am opening the hot water faucet without using nor gas, neither heating.*

(Participant 3) *When we have to replace the large appliances, refrigerator, freezer, television set (...) **we pay attention that they will have a lesser environmental impact...***

Economic Barriers: In both groups, adopting sustainable solutions means also coping with expenses that are often considered quite high for a single household. This aspect could be very interesting also in consideration of the more general aspects of individual vs. collective actions in the energy field, which constitutes one of the core issues under investigation on the entire ECHOES project.

HIGH (Participant 5) *In my old home, I did replace the windows and paid about 20.000,00 Euro, thus this is a significant expenditure [...] So 20.000,00 euro spent now, ok I will distribute them over time and will spend more in energy. That does not mean that I won't do that in the future, however, refurbishing expenses for a house are cumbersome.*

(Participant 4) *Yes, for refurbishing the house I am living in, being 20 years old, I had to redo it now I would pay more attention to energy items, so windows of a certain type, insulation, I would pay more for sure.*

LOW (Participant 2) *A barrier is fundamentally the economic issue, that is the initial expenditure being quite high.*

(Participant 1) *An expenditure about which I thought many times, but that has been delayed just because of economic reasons.*

Lack or Limited Availability of Incentives: The participants reiterate the importance of knowing of, and being able to access with easier bureaucratic procedures to, the various national incentives, which can encourage the citizens' use of renewable energy sources, like photovoltaic, thermal-solar, wind power.

HIGH (Participant 4) Incentive either economic as well as possibly, logistic. Or, as a matter of fact, how to dispose of the old one... therefore I will keep the one I have.

(Participant 3) I think of the choices the only incentive I see is the economic one or one that would improve your comfort, that is you won't need to feel uncomfortable or be more stressed or less... and also the alternate way is also costing more, even if everyone agrees, however if you are not compelled, you won't do that, at least in my opinion.

LOW (Participant 5) At an economic level, it has a major influence, because we here would like also to get storage batteries and all the rest **but there are no incentives, all must start with ourselves.**

(Participant 4) You shall get a benefit, an incentive...

(Participant 5) This must be a **motivated incentive**. This means that I don't need to get the message that if I collect a certain amount, I will receive this benefit. I collect this other amount I will receive this benefit that is used for...that such a thing aims at an environmental issue.

(Participant 2) We have tried to install them; however we would have to refurbish all of our home roof and since **you don't refurbish all of your roof with few money, consequently, the choice is to forget about installing them.**

Reflection on energy and climate aspects

Global Warming Perspective: The HIGH group representatives believe that all the issues related to global warming and the theme of renewable energy are connected to governmental choices made at the global level. Such choices, instead of limiting global warming, are perceived as leading to policies that could lead to adverse consequences. Again, it has been emphasised the tendency to take responsibility away from individual actions and ascribe to the political institutions the issue to recognize the urgency of the climate risk. This seems due, especially, to global political and commercial interests, of which people have limited knowledge, and which might lead people to the experience of helplessness feelings. Although the participants recognize a personal sensitivity towards global warming, and they try to change their attitudes adopting sustainable behaviours, it does not look like there is a concrete reflective thinking with real consequences on daily lifestyle. However, among the LOW group representatives it mostly emerges a sense of responsibility and personal commitment towards global warming issues, which might lead to utilise more knowledge sharing possibilities in order to cope with climate change.

HIGH (Participant 6) It may be a trivial opinion, but **global warming is mostly related to slightly bigger issues**, industrial productions, trivially talking about the cars too, we still have gasoline, diesel cars...

(Participant 2) Global warming, as a matter of fact, is a **debated issue by the major world powers, but really because further looking politics were needed**, in my opinion, with regards to those we can do in our on our little world out of a mere convenience, more or less, I don't know

(Participant 5) For sure if we all would do in our little world probably a minimum effort... But I don't know, **in my opinion global warming is related to slightly bigger issues than our small behaviours (...)**. Maybe this sounds a bit selfish...

LOW (Participant 1) Like he is saying, even the importance of being all together and share is that **some messages arrive stronger** and maybe at times they are even clearer **when they are shared**, because maybe by myself I wouldn't study that.

*(Participant 4) I believe that as much as **it is important to act, either individually, or through some groups, it is really important because I believe that everyone in his/her little world shall do his/her own**, regardless if they will then collect all recycled waste together. I do not care about that, **I will do my share**.*

Legislation: In the LOW group arises also the theme of legislation, that has a significant role in fighting against climate change imposing rules of behaviour to individual citizens, in order that even those that pay less attention would be compelled to adopt proper behaviours. The majority of the participants in the group seemed to consider the importance to have an obligation. The first answers were mainly about the importance of having a clear rule that requires to adopt a certain behaviour.

LOW *(Participant 5) However I believe that as far as all this is important ultimately there still be needed someone that will politically impose something from the legislative standpoint.*

(Participant 4) Talking about imposition (provides an example to explain the concept) finally the safety belts on cars, rather the prohibition to smoke. Had someone told us that it would have been preferable not to smoke in public places, ok, would we have reached the level we are today? The obligation or forcing, the recommendation that has however lead us to get a result.

(Participant 3) Providing another example...The problem was solved concretely when a regulation was issued

(Participant 2) In my opinion the problem will, be solved when the obligation is set.

Information and education: In the LOW group also the role of information and education was strongly linked to the possibility of adopting different and more sustainable behaviors in terms of energy savings.

LOW *Participant 3 states "**I believe that information done in a way, however within reach of everyone, may produce a real change**"*

Other two participants support this concept claiming "Information that allows you to choose" (Participant 2) and "Information shall be provided by those that take care of that" (Participant 4)

Participant 5 highlights the importance to promote education programs for the environment and energy saving since childhood "information shall begin with the school for sure, from childhood..." [...] "Let people understand that the word "environment", in my concept, inherent to myself, means my home, it is really the understanding that some things are mine, belong to me, it is like if it was my home. This must start from childhood and let them understand, when you say "environment", it means that is something that belongs to you"

Driving-factors from a mixed methods perspective: Focus group findings and ECHOES survey results Italy

In the following, the results from the quantitative survey and the qualitative focus group discussions in Italy are brought into relation. The structure is provided by the driving factors that could be identified quantitatively, and by the energy impact patterns of the HIGH and LOW energy lifestyle groups visualised in Figure 8.

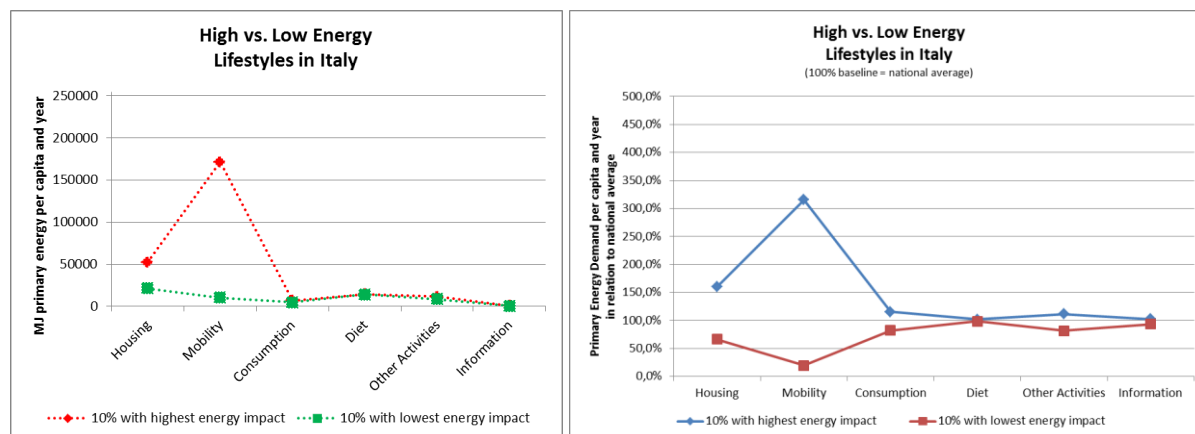


Figure 8: Energy demand profiles of people with HIGH and LOW energy lifestyles in Italy. Absolute values (left) and relative to national average (right).

Driving factors for membership in HIGH group:

People who live in larger households have a lower likelihood to be HIGH group members

People with higher social status have a higher likelihood to be HIGH group members

People who agree with the statement that “renewables create new jobs” have a high likelihood to be part of the HIGH group

People with high personal obligation have a significantly lower likelihood to be part of the HIGH group

Driving factors for membership in LOW group:

Women have a very high likelihood to be LOW group members (Odds-Ratio 2.715)

People with higher social status have a lower likelihood to be LOW group members

On the whole, data emerged from the comparison between qualitative focus groups and quantitative survey are less straightforward, and this could perhaps be also attributed to sampling variability. An example is given by the data according to which people with higher education have a lower likelihood to be LOW Energy Impact Lifestyle. In literature, the education level correlates with environmentalism, therefore would be coherent, but it is also correlated with higher income level, which have much wider environmental impacts. However, some of the trends are identified and could need further investigation.

- It is detectable from the qualitative data emerged from focus groups that women have a higher likelihood to be Low Energy Impact Lifestyle group members.
- Referring to social status, people with higher social position have a higher likelihood to be High Energy Impact Lifestyle group members
- Having a right-wing political orientation does not seem a characteristic of the people belonging to the group Low Energy Impact Lifestyle as emerged from quantitative survey.

Norway: „High“ and „Low“ energy lifestyle focus group discussions

Introduction

The focus group sessions in Norway focused on choices pertaining to everyday life, but also larger choices such as choosing where to live, refurbishing and buying a car. Our sample produced two quite homogenous groups in terms of age and education, which means that what we are able to discuss here are the lifestyles of a quite specific segment of the Norwegian population. None the less, their impact profiles differ significantly.

The HIGH group had 6 participants, aged between 28-40, 4 men and 2 women. All of them had higher education degrees. The LOW group consisted of 5 participants, aged between 27-35, 3 men and 2 women, equally all of them with higher education degrees.

The Norwegian focus group discussed a broad set of topics. Some illustrative examples are Christmas, holidays, everyday choices, housing choices, environmental choices, consumption, plastic, environmental ideals, mobility, energy use, social and political structures and wealth. A key aspect of both groups' discussions was the relationship between individual action and broader social structures. One recurring topic was plastic as a waste problem, and the desire of many Norwegians to act on this issue. Plastic, said several respondents, had become a symbolic token to illustrate environmental attitudes, while key trends in regular consumption remained unaffected. Individual responsibility, they highlighted, needed to be paired with broader political action, to nurture and enable good energy choices beyond symbolic acts such as collecting plastic trash and recycling. Discussions about everyday energy choices and what enabled and restricted them resulted in heated statements about politics, and the lack of political action. As an example, a discussion about the role of consumers in limiting the plastic problem quickly escalated in the HIGH group:

D: (...) and then it becomes individualized, and the individual gets then responsibility for the plastic. I miss doing it in a proper way, to get the politicians to do something right. We can't continue doing things this way. It makes me upset.

F: Stop the drilling for oil.

D: Yes

A: Stop the export of arms.

B: Stop chopping down the rainforest.

C: Stop the coal extraction at Svalbard.

I: Yes, but it is what you have on your mind, too?

D: Yes, [individual action] it is symbol nonsense.

Most of Norway's welfare comes from oil, and an important political debate concerns if or how fast oil production should be phased out, or if one should stop looking for new oil fields. In the low impact group, one of the informants highlighted that this was the key issue where Norwegians needed to make a proper energy choice, and that this transgressed any needs for changing morning routines and making small everyday life changes. Hence, he highlighted that the most important energy choices was actually to vote.

(LOW E): I have thought about it [making adjustments in everyday life], but have not done anything. So yes, I use two boiler plates on my oven in the morning, but it is a drop in the ocean. Look at all the structures around me. As long as I am voting for the green party or the socialist left or someone else who takes this (environmental issues) seriously it is fine, then I do my part.

Several respondents discussed similar matters, highlighting the importance of making systems that supports individuals' possibilities to make good energy chooses.

Everyday routines

“The culture of consumption an environment friendly choices or ethical considerations”

Informants in the LOW and HIGH group discussed what they understood as a difficulty of making environmentally friendly choices in their everyday life. An aspect of this was related to an understanding of being part of a system that was moving in one direction, and being relatively powerless as an individual. Several respondents highlighted that there were so many potential energy savings choices available, and that it was difficult to navigate between them and to know what actually worked. Hence, a lack of knowledge was brought up, which was paired with a frustration about knowledge claims constantly changing. Still, several respondents highlighted the virtue if making good choices, of doing the right thing as an individual as important. One of our informants in the LOW group said:

(LOW D): I think it could be made easier to make the right choices. That would have been cool. If we as a society decided to move in one direction, where [green] choices.. [are made easy]. At the same time, I feel I have a good life, and when I make bad choices, I feel bad. But when I make good choices, I feel good.

Hence, this respondent expressed a conscience that was tightly attached to environmental choices. This, she explained, was also related to being part of a social group and community where environmentally friendly choices were highly valued. One strategy highlighted by respondents in the LOW group had was to buy locally produced food.

(LOW B): We buy local food. We get vegetables from Frosta (a local farmer place). And if we want broccoli and it's only from Israel at the store, I do not buy it. It's more political. But yes, try to buy food that have not traveled a long distance.

On the one hand he made a political choice of not supporting Israel related to the Palestine-Israel conflict, and on the other hand he wanted to buy short travelled food. This illustrates how different types of motivations for making choices have potential sustainability impacts. This can be contrasted with the views expressed by another respondent in the low impact group. He also made conscious choices with respect to numerous lifestyle aspects, but these were rooted in a set of ethics where choices were not made based on environmental considerations. He said:

(LOW E): I think my lifestyle is ethical, and not environmental, really. So when I buy an Avocado I think: Now I'm stealing 40 000 litres of water from someone in South America. Or when I buy clothes from Hennes and Mauritz, I think: someone has been locked up in a room at all times of the day just to make that for me. I want to avoid that. But flying? No, thats not a big deal, really.

This respondent's lifestyle was in many ways environmentally friendly and low impact, but environmental considerations were seldom a part of the equation. The difference between making environmentally oriented choices and more general ethical choices also emerged as a theme in the HIGH group. An example of this was a discussion on food waste. Here, attitudes about not throwing food away and respecting food was rooted in family socialization according to informant D in the HIGH group.

(HIGH D): Yes, I am very good at not throwing food away. I am very careful when it comes to this, but this is something I have from my home. You just don't throw away food. But I don't know if it is about the environment. It has more to do with thinking about resources. For me it is about respecting the food.

Many highlighted that this primarily resulted in new choices with respect to consumption and with respect to food and food waste. When they reduced their organic waste, it was of respect for the food an attitude that was established in childhood. These respondents also highlighted how they were part of an everyday culture of consumption which they understood as different from that of e.g. the 1970s, when Norway became a wealthy nation

in part because of the discovery of oil. The average salaries have risen, and the relative prices of clothes and other things have decreased:

(HIGH D): *I have crazy amounts of clothes, but it is so cheap. It also has changed a lot. I am born in 1967, so I am probably the oldest person in this room. I remember the 70's. I come from an ordinary home with an ordinary economy. We were four kids, and that's how it was meant to be. I remember the happiness I felt when I got new clothes. We also had less toys than my kids have today. The consumption growth I have experienced while I have lived in Norway is extreme. I don't think we ever think about it.*

Today, most Norwegians can quite simply afford to buy clothes and other consumer goods. One of the informants reflected on the difference between her own childhood and that of her own children. The differences were mainly related to the spending of money. They were not poor, but they did not buy new clothes or toys often. Hence, she highlighted that lifestyles are embedded in broader social structures. The LOW group discussed similar issues, highlighting that lifestyles need to change drastically if we are to reach any of the many ambitious environmental goals that we currently claim to have. One of the LOW respondents highlighted that the most environmentally friendly lifestyle you could have, was actually to be a beggar, and that the needed changes would mean moving down towards this standard of living:

(LOW C): *It is like a parody, almost, an environmental lifestyle. Its like a beggar. That is in a sense how you have to live. So the lifestyles we have [today] are so out of sync with the environment on a macro scale that it is difficult to adjust in that direction.*

Hence, this respondent expresses a frustration concerning the gap between what is needed and the structural pressures of society. Both people in the LOW and HIGH group highlighted the environmental problems of contemporary lifestyles, and this lifestyle had changed over the last 50 years:

(HIGH D): *If you ask my parents to fill out a questionnaire about prioritizing jobs over environment, they would choose the jobs. They didn't have the [environmental] attitudes, but they had the actions, right. They never travelled anywhere. [...] But you had a different mentality, and I think that gives something. I think some of it is on its way back. A trend of "do it yourself". It is something basic. I think we have reached a saturation point.*

The environmentally friendly lifestyle today was highlighted as being the expected way of living 50-70 years ago. In our sample, the differences between the two groups were marginal. A key difference is that the respondents in the HIGH group primarily understood everyday environmental choices as symbolic action, while our respondents in the LOW group to a larger degree discussed everyday choices as a part of, and a starting point for a broader sustainability transition, and a step towards more environmentally oriented consumption in society.

Leisure time and vacation:

Christmas and holiday traveling

Perhaps surprisingly, an aspect that was eagerly discussed in the high impact group was the celebration of Christmas. The HIGH group discussed the role of consumption of things related to Christmas, and several respondents argued that this period was key to understanding the development of new social norms and bad environmental attitudes amongst children. Both children and adults in Norway, it was highlighted, have all they need, and Christmas adds material weight to Norwegian lives. Informant D in the HIGH group stated:

(HIGH D): *It is actually not [spending the] the money that provokes me. It is so unnecessary. It is just even more of the stuff we have too much of already. I think the whole thing is just misunderstood.*

The informant stated that Christmas is a misunderstood event when it comes to consumption of things. As the anthropologist Gullestad (1989) have noted, traditional Norwegian virtues suggests that gifts should serve a practical function and fulfil a need. Our respondents highlighted that this is different today:

(HIGH C): But objects – I have enough money to buy the things I need myself. And this applies to everyone else too. Then it doesn't have any value. Therefore, I think it's weird that we reach those peaks every Christmas.

The discussions circled around children, and the role of Christmas in shaping their expectations for what it means to live a good life. Most children receive gifts through advent gift calendars every day from the 1st of December to the 24th. Our informants in the focus group highlighted that this had been changing gradually and that it was different in the 1970s, 80s and 90s, when it was more common that several siblings shared one calendar with modest gifts. Today the HIGH group stated that people get too many things they do not need and that Christmas eve is an anti-climax for the children who by then are often tired of all the presents. Still, many highlighted the massive cultural pressure of keeping up and expanding on the tradition, in part because the gift giving is embroiled in intimate and personal relationship, serving as a strong symbol of love and care.

Another element that was discussed in relation to holidays was air travel. In the LOW group, some of the participants had actively tried to reduce their flying, e.g. through spending their summer holiday in Norway, travelling by car, and taking a trip abroad only every other year. Summer holidays, many highlighted, came with strong expectations of travelling, which means that they are also periods where standard consumption patterns are disrupted. For some, it also entails a 'break' from thinking about environmental issues. As participation D in the HIGH group noted:

(HIGH D): This summer, I was in Montenegro, and one day we took the bus to Albania. We visited small cities, and then we drove by taxi because it was very cheap. It worked just fine. But I don't think about the environment when I am at vacation. Not at all. This year I also went to Thailand for nine days. This airplane departs if I am on it or not. I don't help if I stop taking vacations. It doesn't help at all.

Both participants in the LOW and the HIGH group highlighted that flying was not good for the environment, but the attitude in the HIGH group was that they could not do anything about it. The airplane would fly regardless of their choice. In the lower impact group, they also flew on holidays but some of the respondents there also made conscious choices of spending their holiday in Norway by car. However, as participant B highlighted, the choice of where to go on a holiday typically involves some sort of negotiation, where things like the well-being of children also feed into the decision making process:

(LOW B): So, maybe we are thinking about [traveling to] Lofoten and Senja. That is a long drive with kids, when they are three and seven. We might consider sending the wife and children on the plane one way and driving down together. But combine it with a car, so one gets to see the most when you're in the north then. Yes, fly.

Norway is a long country, which means that the drive from Trondheim to Lofoten is about 17 hours in a car. The intention to fly less, then, is often weighed against other practical issues, which means that ideals are hard to live up to. Another participant in the LOW group spend every second summer holiday abroad, and had been doing this for the last seven years. This year they took a car holiday in Norway but the next year they are going to Siri Lanka. In many ways Norwegian holidays are a part of the consumption culture where flying is an essential ingredient of what constitutes making the best out of the holiday possibilities.

On the other side some of informants were missing political action and were frustrated by what they saw as a lack of consistency in political reasoning. Individual responsibility, they highlighted, needed to be paired with broader political action, to nurture and enable good energy choices. Examples were actions to make flying more expensive, and taking the train cheaper. As an example, many highlighted how it is often less expensive to fly to London from Oslo, Trondheim and Bergen, than it is to buy a domestic train ticket.

Life decisions

Housing and mobility

Housing and mobility stood out as two key themes in our discussions about big life events. Hence, we will provide some context of these issues in terms of the ECHOES focus on energy cultures, as a way to make sense of the decisions discussed in the focus groups. Housing is a key element in the Norwegian energy culture, where home ownership has been identified as a dominant norm and practice (Aune 2007), in part because home ownership is considered a secure way of saving money (Frønes, 2004). While the goal for most Norwegians is to own a home the ability and means to do so differs with age and income. Fjærli (2008) has identified what he calls a ladder of home ownership careers, which points to structural similarities in choice and desires of home ownership during a lifetime. The classical pattern is to live with your family until after high school, before moving out to get an education. During the education it is common to share an apartment with other students. As income increases with access to the job market the pattern is that houses grow larger, which continues as families are established. Hence, ways of family life that demand much space is culturally qualified.

In Norway, the dwelling is the symbol of family and home. Aune (2007) noted how Norwegian homes take on multiple meanings: as havens, as a project, and as a site for activities. In all instances, activities in these homes entail energy intensive practices. Energy, however, is seldom an explicit aspect in creating a 'home'. Producing a home is also an expression of taste and status. Gullestad (1989) highlights that Norwegian ideals of how to live a good life, has historically been anchored in ideals of diligence, simplicity and sobriety, valuing the practical over the aesthetic. Nevertheless, her ethnography of Norwegian everyday life identified a particularly strong interest for rebuilding, redecorating and home design in Norway, which can be explained by the fact that "rebuilding and redecorating the home [...] gives Norwegian women and men the ability to engage in creative play camouflaged as serious, useful activity that 'has to be done'" (Aune 2007, p. 5458). In our discussions it is quite clear that energy, e.g. in the form of housing energy efficiency certificates was seldom a criterion when deciding whether or not to buy a building. Size, number of rooms and aesthetics, however, did matter. Like informant A in the HIGH group stated:

(HIGH A): We got children in Oslo, and then we moved to Trondheim in a house that was built by a constructor, we didn't build it ourselves. It was right next to Dragvoll. And then it got sold, because it became too small. The third child was not included in the calculations when we bought the house.

On the other side of the ladder of home ownership we have one of the informants in the LOW group E. He had moved out from his parents' home to study and live in a shared house. However, due to a conflict with his land lord, he had chosen to move back with his parents. Most participants who had been a student had experience with sharing a house during their studies. Life situations differ but we find a similar tendency when it comes to mobility choices. Getting children has an impact on people's mobility choices.

In terms of mobility in Norwegian energy culture, Norway has been described by historians of technology as a particularly mass-motorized society, in which much deliberate work has been conducted over decades to solidify this reality (Østby 2004). Hence, auto-mobility demand in Norway is as Shove (2010) has noted, often a product of societal structures. In our focus groups, our informants with children all owned a car, which was typically explained with reference to the logistics of everyday family life. Norwegian toddlers typically start kindergarden at the age of one.⁴ As a relatively equality oriented society, both parents in Norway typically work, and there is a strong cultural pressure for children to participate in after school activities, which are often located in other places than where most people live.

⁴ <https://www.regjeringen.no/en/topics/families-and-children/kindergarden/early-childhood-education-and-care-polit/id491283/>

Hence, our informants highlight that proper Norwegian family life as they understood it, was to a certain degree car dependant. The car is connected to the parents desire to make the best opportunities for the children and themselves. The car makes them mobile and broadens the potential choices of leisure activities (Freudental-Pedersen, 2009). This backdrop discussion on mobility illustrates how essential it is to analyse lifestyle and choice in tandem with broader societal choices. An example of this is to look at societal choices such as where to build large sporting facilities and other sites that house activities for large numbers of small children, as these might be examples of what Royston et al. (2018) have called invisible energy or mobility policies.

Hence, our focus groups, perhaps not surprisingly identify a large difference in how informants with and without children make sense of and reason with respect to housing and mobility.

Summary of focus group results in Norway

The focus group results suggest that Norwegian lifestyles and consumption tends to be attached to comfort in terms of choice of houses, means of transport and traveling. Both groups clearly indicated that they understood this as a non-sustainable way of living. Through our focus groups, we found a slightly higher commitment to environmentally friendly choices in the LOW group. Not because they believed it would save the planet, but because they thought it might be a small start, and because it felt good doing 'the right thing'. Further, this gave them a sort of moral leverage, so that they could travel on holidays with a plane without feeling too guilty. However, in both groups, there were very few who were interested in lowering their comfort levels. Issues such as family life, work situation and other socio-cultural and practical aspects, it was highlighted, left little room for changes. Hence, the individuals can be said to act in coherence with a broad social and cultural field, a dynamic that has been highlighted by numerous scholars, e.g. Lidskog and Sundqvist (2013).

Our analysis has suggested four key factors to understand how individual make energy choices, and make sense of their own life styles and lives in the Norwegian context. These are *ethical considerations*, *cultural consumption*, *symbolic action* and *structural impacts*. In what follows we will briefly discuss these.

Ethical considerations: When choosing groceries, consumer goods or clothes in their everyday life, informants in the low impact group pointed to ethical or political considerations as impacting their consumption choices to a much larger degree than environmental issues. Examples of this include not buying avocados due to poor water management, and not buying certain products due to their potential roles in war and conflict economies. Scholars have highlighted that ethical consumption is at a high level in the Scandinavian countries, but the political context currently does not support collective ethical consumption according to Nassauer & Vasi (2018). Building such a political context, then, might also help nurturing environmentally friendly everyday consumption choices.

Cultural consumption: While our focus groups represent HIGH and LOW impact, they both illustrate how we live in a consumption oriented culture where almost all aspects of a good life is associated with some form of material consumption. Both our groups expressed concerns with this culture, and feared that they were re-producing the same culture and material expectations e.g. through rituals such as Christmas, summer holidays or more mundane activities.

Symbolic action: Many of our respondents in the two focus groups discussed actions that were broadly considered environmentally friendly, but which our respondents often highlighted as symbolic and with little consequence. Examples are sorting garbage, not using plastic bags, having a festival without plastic beer cups. A key challenge, then, it seems is how to work against this sort of fatigue, in order to make individual action meaningful.

Structural impacts: The informants in both groups highlighted that there was a level of asymmetry in discussions about the environment, where individuals were expected to bear too much of the burden. Both groups called for much more active policy interventions, which targeted both what they understood to be the root causes of the

environmental problems, and their own consumption patterns. Examples of the first could be policies to phase out the petroleum industry. Examples of the latter could be enforcing higher prices on flying, and lower prices on domestic trains.

As a result of the sampling strategy, our two focus groups ended up being relatively homogenous. Our results should probably be understood with this as a backdrop. When making sense of their consumption patterns and lifestyles, our respondents all mobilize significant educational resources, as well as strong traits of a distinct upper-middle class habitus which cannot be said to be representative of Norwegians as such. For us it would be difficult to assess how differently composed groups would influence the results, but earlier studies on political consumption does find that education had a clear impact on consumption and political engagement (Anderson and Tobiasen 2004:216).

Driving-factors from a mixed methods perspective: Focus group findings and ECHOES survey results Norway

In the following, the results from the quantitative survey and the qualitative focus group discussions in Norway are brought into relation. The structure is provided by the driving factors that could be identified quantitatively, and by the energy impact patterns of the HIGH and LOW energy lifestyle groups visualised in Figure 9.

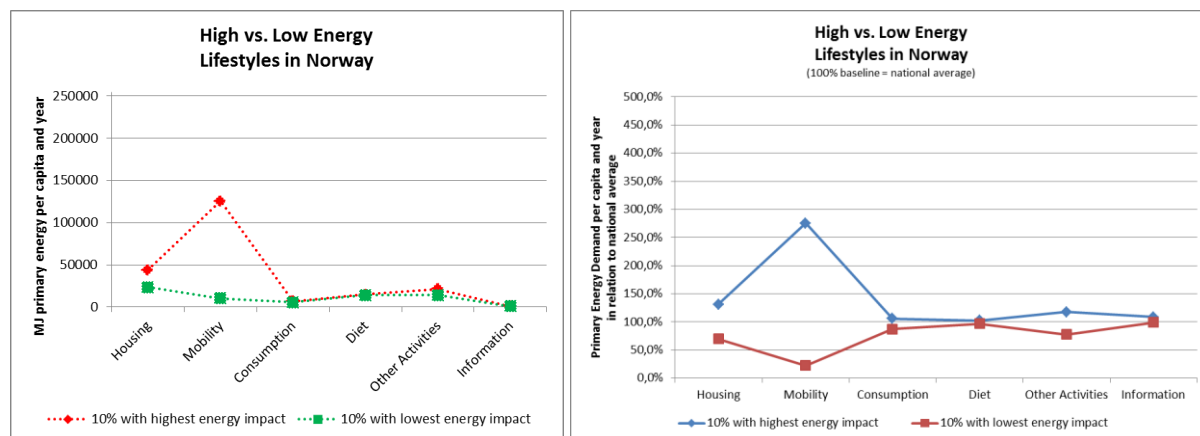


Figure 9: Energy demand profiles of people with HIGH and LOW energy lifestyles in Norway. Absolute values (left) and relative to national average (right).

Driving factors for Membership in HIGH group:

Rural living environment reduces the likelihood to be a LOW group member (Odds-Ratio .389)

People with a right political orientation have a higher probability of having a HIGH impact lifestyle

Driving factors for Membership in LOW group:

People with a higher social status are less likely to be LOW group members

People who feel the personal obligation to act energy efficiently and support respective policies are more likely to be LOW group members

Acceptance of policy measures with the aim of protecting the environment, even if higher individual costs may result, decreases likelihood to be LOW group member

Due to the sampling strategy the two Norwegian focus groups are relatively homogenous in terms of age, income and education. This means that a word of caution with respect to generalizability is in order.

Living in a rural area reduces the likelihood of being a LOW group member

This resonates well with some responses in our focus groups. One of our high impact informants highlighted that him and his family had moved out of the city as their family had grown. The rationale was that with more children they needed more space. However, moving does not necessarily mean finding a new place to work. Hence, the consequence was a) that the respondent has a much bigger house, and b) that the respondent becomes a commuter, hence increasing the need for transportation. The three biggest cities in Norway are all growing quite rapidly. The same, however, is true for neighboring municipalities. The municipalities with the highest growth of inhabitants are currently located around Oslo (SSB 2017).⁵ An older survey from Statistics Norway (SSB, 2002)⁶ highlights that about one out of three Norwegians works in another municipality than they live in – a trend, which has likely increased since then. Two of the informants in our high impact focus group were commuters, who combined car and train to get to work. The car was the preferred way to commute for both, but due to parking costs

⁵ <https://www.ssb.no/befolkning/statistikker/folkemengde/aar-per-1-januar/2017-02-23?fane=tabell&sort=nummer&tabell=295656>

⁶ <https://www.ssb.no/befolkning/statistikker/fobpend/hvert-10-aar/2002-12-06#content>

one of them frequently used the train. All the other informants lived and worked/studied relatively centrally in Trondheim. The example, however, illustrates how actors such as large employers might have the opportunity to influence energy choices, e.g. thorough charging for parking. This, however, should be paired with the expansion of public transport in order to stimulate pro-environmental lifestyle choices. The issue of rural and central living also highlights a key tension in Norwegian policies when it comes to the relationship between settlement practices and climate impact. Currently, the trend in most cities is to advance densification. This is a strategy that makes apartments smaller and decreases living spaces, also with the outspoken goal of reducing the demand for transport. On other hand, Norwegian national policies has for more than 100 years explicitly been geared towards populating the entire country. In part, this has been made possible by the Norwegian hydropower regime, which combined with welfare state policies has catered for the emergence and sustainance of industrial jobs and high quality living in rural areas. This includes a strong provision of municipal services such as schools, home care for the elderly and administrative services also in small, remote and rural places (Aasbrenn & Sørli, 2016). Today, this means that people can live rurally, quite inexpensively without sacrificing large aspects of their quality of life. This, however, comes with an environmental cost.

People with a higher social status are less likely to be LOW group members

In our focus group material, all informants can be considered to have a high social status based on education, social capital, as well as income or income of family. The low impact group discussed how people with no or low income did not have the money to participate in mass consumption, and that they therefore lived a more environmentally friendly life than most Norwegians did. Today, much of the 'good life' seems to be culturally embroiled in consumption oriented discourse and practices. However, given the relatively homogenous character of our focus groups, this was difficult to notice.

People who feel the personal obligation to act energy efficiently and support respective policies are more likely to be LOW group members

We made a related observation in our focus groups. In the LOW group, respondents to a larger degree than in the HIGH group stressed that individual action could make environmental impacts, and that it could help advance a broader energy transition. This was reflected in discussion about concrete actions such as food computation. In our focus groups, people say that they will contribute if they experience the societal burden of changing as fairly distributed. This group too, however, reflected on how their travel patterns were embedded in broader societal and normative structures, which made changes difficult. Therefore, this group too called for a stronger political push to help individuals make environmentally friendly choices.

Acceptance of policies to protect the environment with higher costs, decreased the likelihood to be LOW group member.

It is difficult to interpret these results based on our focus groups. While both focus groups wanted more regulation and action from the government, the LOW focus group also highlighted the importance of individual action. An interpretation of these results that were not much discussed in the focus groups, might be that many of the costly energy and climate related policies in Norway, actually benefit the quite wealthy. An example is the electric vehicle policy, which allows a wealthy segment of the population a choice of being green. While not prominent in our focus groups, the socially skewed economic redistribution this entails has been debated in Norway.

Spain: „High“ and „Low“ energy lifestyle focus group discussions

Introduction

This is a summary of the main findings of the two focus groups we held in Bilbao on October the 19th and October the 26th 2018.

The focus group held on October the 19th was composed by the so-called LOW energy profile participants. On the other hand, the focus group on October the 26th was composed by HIGH energy profile participants. The structure of both focus groups was the same and it was based on the guidelines and structure provided for the development of these meetings: Everyday routines, Leisure time and vacation, Life decisions and Reflection on energy and climate aspects.

We added an additional issue related to the electric power supplier: distribution of electricity in Spain has been a monopoly for years but it is an open market nowadays. We wanted to explore if the participants have made any decision to change their electrical power supplier.

The Low Energy Profile group (hereafter LOW group) was composed of 5 people: 2 of them could be considered rural, the other 3 can be considered urban. 1 family unit consisted of 4 people, family units of 2 people, and 1 person living alone.

The High Energy Profile group (hereafter HIGH group) was composed of 6 people: 2 of them could be considered rural; the other 4 are urban people. They lived in 1 family unit of 6 people, 1 family unit of 5 people, 3 family units of 2 people, and 1 person lived alone.

As a curiosity, both people with the lowest energy profile and the highest energy profile (according to the survey results) attended our focus groups.

Everyday routines

Participants in the LOW group use more public transport than those in the HIGH group. Most participants in the HIGH group drive their private cars to their workplaces. There are no great differences between both groups regarding everyday routines other than the travel to work.

Leisure time and vacation

An important difference between both groups arises when it comes to leisure time and vacation, the HIGH group travels much more in plane and makes much longer trips than the LOW group. Travels by air in the HIGH group were not only for leisure but also for work. There was no need to travel by air for work in the LOW group.

Life decisions

Regarding the purchase of a house, in the LOW group two participants lived in a rental apartment and the other 3 owned their homes. The place of residence was decided for several reasons: proximity to friends and family, ownership of a land to build a house and availability of financial resources. In all cases but one there were no energy efficiency related concerns that affected the purchasing decision. One of the participants built a house from scratch and considered many energy issues when building it: clinker bricks and double-glazed windows for isolation, radiant floor, and photovoltaic panels. In the HIGH group and regarding the purchase of a house, all participants owned their houses (one participant even owned two houses). The place of residence was decided again for several reasons: proximity to family and friends, proximity to workplace, heritage and in one case the need to escape from noise and traffic. Again, there were no energy related issues affecting the purchasing decision. This is similar to the LOW group. It was assumed that being relatively new, the houses would be well isolated and energy efficient. In some cases, actions were taken after buying the house to improve its isolation and energy efficiency.

Regarding the car purchase, most people in the HIGH group looked at some kind of electric/hybrid vehicle when they were about to buy a new car but they gave up because there was not a wide selection of cars and there are

still many problems that have to be solved as autonomy, and lack of charging infrastructure. So they preferred to choose a fossil fueled car until the technology is mature enough to decide on an electric car. In the LOW group only one person considered buying an electric car but gave up because it was too expensive.

Reflection on energy and climate aspects

When asked about the role energy efficiency plays in their everyday lives, both groups gave similar answers and mentioned recycling, replacing conventional light bulbs by LED and purchasing energy efficient appliances. As a difference the LOW group mentioned using public transport.

Regarding gas/electricity suppliers both groups had similar behaviour. There were people in both groups that were working with energy providers that ensure that the energy they provide comes from renewable sources. In both groups they were working with energy cooperatives such as the Spanish SOMENERGIA and GOIENER and the experience was very positive. Some of the participants in both groups had never heard about energy cooperatives before and only learned about them during the meeting itself.

Driving-factors from a mixed methods perspective: Focus group findings and ECHOES survey results Spain

In the following, the results from the quantitative survey and the qualitative focus group discussions in Spain are brought into relation. The structure is provided by the driving factors that could be identified quantitatively, and by the energy impact patterns of the HIGH and LOW energy lifestyle groups visualised in Figure 10.

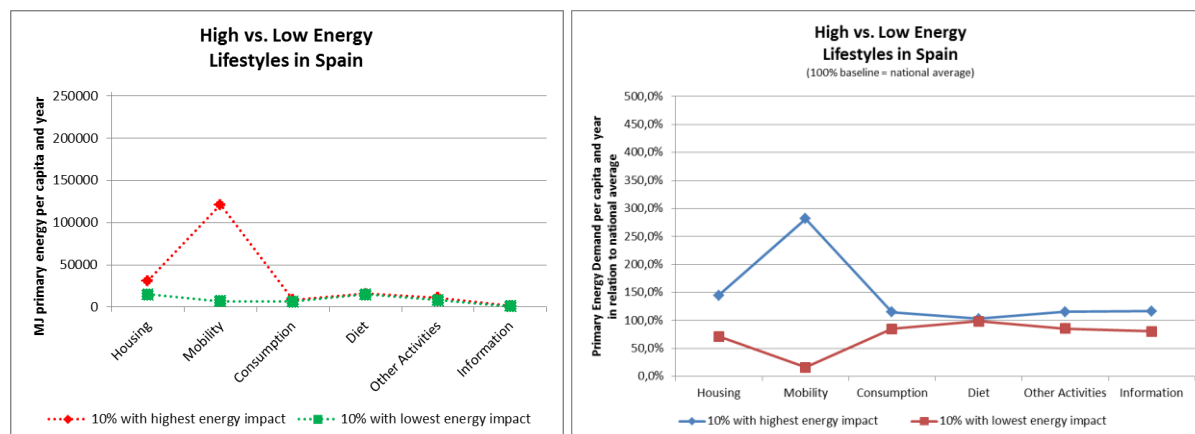


Figure 10: Energy demand profiles of people with HIGH and LOW energy lifestyles in Spain. Absolute values (left) and relative to national average (right).

The quantitative findings for Spain conclude the following driving factors:

Driving factors for Membership in HIGH group:

Rural living environment increases the likelihood to be a HIGH group member (Odds-Ratio 2.284)

People with a higher social status have a higher likelihood to be HIGH group members

People with higher education level have a higher likelihood to be HIGH group members (Odds-Ratio 2.677)

Right political orientation increases the likelihood to be HIGH group member

People who agree with the statement that “renewables create new jobs” have a high likelihood to be part of the HIGH group

Driving factors for Membership in LOW group:

Women have a higher likelihood to be part of the LOW group (Odds-Ratio 1.798)

Rural living environment increases the likelihood to belong to a HIGH group member

The qualitative findings of our focus groups (both of them) do not come along with this statement. We have had the so called “rural” world equally represented in both groups and we have found no relationship between the rural living environment and the likelihood to belong to any of the HIGH/LOW groups. It is also true that in our case the difference between rural/urban living environments was not so clear, so we asked the participants if they considered that they lived in a rural or urban environment. Only 3 of them considered to live in a rural environment. It may thus be that the rural living people have been underrepresented in our focus groups.

People with a higher social status have a higher likelihood to be HIGH group members

These findings might be slightly closer to what we have seen in our focus groups. There were no high differences in social status between both groups but it is true that the social status in the HIGH group members was higher than that of the LOW group members. The lack of financial resources was only mentioned in the LOW group when talking about buying/hiring a house, buying a car or travelling.

The higher social status of the HIGH group is also evident when it comes to leisure activities: most participants liked travelling and flew frequently to remote destinations.

Turkey: „High“ and „low“ energy lifestyle focus group discussions

Everyday routines

The everyday routines were easier to define for individuals that have a regular job. For individuals that do not have a regular job, however, there is still a set of practices that are likely to be repeated often. The extent to which the daily routines are well-defined also depends on how flexible the working conditions are for different individuals:

(R6 HIGH) My daily routine depends on where I will be working on that day. I also participate in trials out of the city. When I will participate in a trial in the city that has a population of 4.2 million in Aegean Region, I leave home early to go to courthouse.

(R1 HIGH) I spend nearly 50 km in total to arrive university and go back home. However, I come to the university only 2 days in a week. I never go to the city centre. During summer months, I even spend less time at university, because I am a part time lecturer here.

(R5 LOW) I have a strict daily routine during weekdays

(R2 LOW) Last year, I came to school nearly every day, but I don't visit school every day now as I don't have any course in this semester

The everyday routines and decisions regarding driving habits and transportation choices are important from several aspects. First, transportation is a key activity in the urban areas and is a major consumer of energy. Therefore, it is important in terms of energy consumption, energy savings, and energy-related behaviour. Moreover, the greenhouse gas emissions emanating from transportation in cities have severe adverse effects on the environment. These environmental effects as well as other aspects such as the traffic congestion, noise pollution, depreciation of vehicles and transportation infrastructure, also extend to the liveability and quality of life in the cities. At this point, the first contrast regarding the daily routines of the high and low energy consumer groups is encountered in the driving habits and practices. As expected, HIGH consumers have a daily private driving routine. This is usually practiced as single-person drives, whereas LOW consumers opt more for public transportation:

(R3 HIGH) I leave the home and arrive university by my car.

(R8 HIGH) My wife and me drive our own private cars, and my son goes to school by school bus

(R2 LOW) I generally use public transportation tools when I go out

(R3 LOW) I come to school every day by using public transportation tools and I make three transfers. I use metro line and take two different buses to arrive at school

(R7 LOW) I try to use my private car once in a week. In general, I prefer public transportation tools

Several reasons emerge as the significant factors that affect the individuals' choices on the private driving or public transportation habits. The foremost such factors are saving time, comfort, costs, and convenience. Environmental considerations are not cited among the main reasons. According to the HIGH consumers, the main reasons for choosing private driving are time savings; along with comfort and convenience. However, for the LOW consumers, it is rather the costs that imply the use of public transport: Some low energy consumers still care about time savings:

(R3 HIGH) ... it is not about financial issues ... the major reason behind my preference is to save time. Last year, I was taking her [my daughter] to school by my private car, but I don't have much time this year. For this reason, we prefer the school bus to save time

(R6 HIGH) I mostly prefer the freeway. It is much more comfortable for me

(R5 HIGH) Because of the location of my home, it is also difficult for me to take the minibus or metro; there is no metro line and metro station near my home

(R1 LOW) As the gasoline prices are extremely high, I would not prefer using my private car if I had one

(R5 LOW) From my point of view, none of these public transportation vehicles provide comfort. Yet, I select the most suitable one by considering saving of time and the distance of my house to the station

(R4 LOW) While we want to reduce our electricity bill or energy costs, we lose our time to a great extent because of public transportation

The majority of the private driving activities in urban cities are single-person drives. This is also reflected in the statements of the HIGH focus group results. One viable alternative to reduce the adverse environmental effects of private driving is carpooling. The participants in the high energy consumers focus group demonstrated an awareness of the issue, but are not very much likely to practice carpooling. The main reasons are inconvenience and security considerations:

(R8 HIGH) In fact, we don't have any friends that apply carpool and encourage us to do it. Under these conditions, I don't want to take people that I don't know into my car.

Other than transport and driving habits, the lifestyle routines are usually affected by household-associated issues such as those related with the usage patterns of electric devices, heating and cooling appliances, or kitchenware. These usually have direct influence on the energy consumption characteristics. At this point, high energy users pay less attention to energy savings. Even though they are usually aware of the downsides of this type of behaviour, they do very little to change their attitude.

In this respect, having children or pets, family routines can be identified as barriers for reducing the energy usages or increasing energy savings:

(R8 HIGH) Our home is always hot; the room temperature is always around 24-25 °C as we live with a little kid. Furthermore, the lights are always on as my son looks round all the rooms

(R3 HIGH) When my children leave the room, they always leave them [the lights] on. Unfortunately, I cannot put pressure on them to turn the lights off. I can criticize myself on this issue

(R8 HIGH) We cook every day at home as we have a child. We have a housekeeper that is responsible for cleaning the home and cooking. Therefore, the washing machine and dish washer are running all the time.

(R5 HIGH) As they [my dogs] are puppies, they are afraid of being left in the dark. Therefore, I turn the lights on all the time and when I go outside, I leave them on. I also leave the TV on as they like watching cartoons.

The low energy users demonstrate similar behaviours regarding their everyday routines affecting daily household energy consumption and energy saving practices. One main difference, as compared with the high energy consumers is that they have more motives – usually cost considerations – to reduce their energy consumption. Another main difference is that the low energy users have less control on the household decisions. It is usually other members of the family or parents and the infrastructure that they have established that are active in the decisions regarding the energy related issues:

(R7 LOW) As I live with my parents, I am not the decision-maker regarding the decisions taken in relation to energy choices

(R3 LOW) The TV is always on during day hours... Naturally, I consume electricity. However, I try to decrease my personal electricity consumption as my mother always warns me about the high electricity consumption of the hair

dryer and curling iron. My sister always turns the lights off when she leaves the room. I generally leave the lights on, but she always warns me on this issue. She is more sensitive than me regarding electricity consumption

(R5 LOW) ... the computer is always plugged in. Besides the normal work flow, I also spend time on social media. Therefore, my personal energy consumption is quite high

(R6 LOW) During summer months, the air conditioner continuously works as my brother likes cold weather. He is the one that consumes energy at the maximum level in our home. Moreover, he leaves the window open while the air conditioner is on.

The everyday routines regarding energy usage are also affected by the perception of whether the energy resources are abundant and cheap or scarce and expensive. Individuals tend to pay more attention to energy savings when the cost of energy is high and availability is limited; and less if the cost is low and energy is abundant. This behaviour may also be reflected in the cultural norms of the society. One respondent referred to a behaviour of this type s/he encountered in her household.

Leisure time and vacation

A difference in the leisure time and vacation behaviours can be observed across HIGH consuming and LOW consuming groups. The HIGH consumers tend to act more or less similar to their daily routines, whereas, in their leisure times and vacations, low energy consumers act more relaxed in terms of energy consumption, caring about energy efficiency and waste, as compared to their daily routines.

(R6 HIGH) I spend most of my time with my friends in a coastal town in summer months. On Fridays, I leave the city and go there and on Mondays, I come back to the city with my father

(R9 HIGH) Even though my energy consumption is too high during these 15 days [of skiing holiday], I can create a balance in my summer holidays as I travel with a sailboat. You don't consume any energy in sailboat

(R1 HIGH) When I visit a foreign country, I pay attention to participate in activities that have less carbon footprint

(R7 LOW) When you go on a vacation or holiday, you want to take advantage of everything there. ...If I stay in a hotel, I never turn the air conditioner off. As a matter of fact, I never care about air conditioners or electricity consumption, because I already pay a specific amount of money to the hotel

(R4 LOW) I also consume more energy on holidays as I never turn the air conditioner off.

(R1 LOW) I spend my holidays with my family. In other words, I don't travel to USA or another country with my friends

(R7 LOW) I try to be more relaxed at weekends and I don't think about my energy consumption too much.

This is also reflected in the driving and transportation choices:

(R7 LOW) I can travel by my private car up to 8 hours. If I have a chance to book a flight in advance for a cheaper price, I can prefer travelling by plane for longer distances

(R1 LOW) For example, we visit my parents' hometown in the semester holiday and we stay there for three weeks ...When they [we] travel to their hometown, they use private car and they visit there nearly four times in a year

(R3 LOW) We can prefer both of them [plane and bus], but we went on the Balkan tour by bus ...However, the previous year, we went to Eastern Black Sea Region by plane

(R2 LOW) Moreover, I prefer travelling by my private car for long journeys

For low energy consumers, however, cost considerations are still of concern. One explanation for acting more relaxed in terms of energy consumption, caring about energy efficiency and waste is that individuals may feel comfortable enough for taking the necessary types of actions in their daily life routines, and considering leisure times or vacations as exceptions:

(R6 LOW) I like plane journeys, but of course, I prefer plane if it is more affordable. Because of current high flight prices, we have to tend towards intercity buses

(R4 LOW) I prefer the most affordable options and plans. At this point, I also select the most affordable transportation option

(R7 LOW) I might feel a bit guilty, yet I assume that the hotel is responsible for all the environmental pollution and high energy consumption. As I believe that I make the necessary energy saving in my daily life, I don't consider the energy saving of the hotel. As I make energy saving during weekdays, I try to be more relax at weekends.

Life decisions

The life decisions are more long-term decisions as compared to everyday routines. Moreover, life decisions are more difficult to change, once they are made. Because they are usually associated with higher costs, longer periods of time, and are linked to other decisions. Therefore, life decisions are also more significant in terms of their impacts. Regarding the energy lifestyles, the choice of one's house is one of the important life decisions. The respondents share similar mindsets about this choice. That is, there is not a big difference between the low energy users and high energy users. The main considerations are ease of access to workplaces. As expected, high energy consumers perceive this as the accessibility by private vehicles whereas low energy consumers seek for proximity to public transport infrastructure.

(R2 HIGH) Six months ago, I moved to a new home that is closer to the university because of heavy traffic, because saving of time was an important issue for me... I had to move to another district one more time because of heavy traffic

(R2 LOW) I moved to my existing home because of its close location to public transportation stations. Therefore, my decision was mostly based on saving of time"

As mentioned earlier, in some cases, the low energy consumers do not have a say in the decisions such as the decision on the location of the house:

(R1 LOW) I live there because of the preference of my parents. They want to live in a district that is more silent and peaceful. I think this is their lifestyle

(R3 LOW) I am not a decision-maker, either in the selection of our existing home... I have not paid attention to environmental concerns until today, but there was always someone in our home to consider these issues

Another type of life decisions is the choice of the heating-cooling systems of the house. At this point, the respondents mainly base their decisions on convenience and availability. In other words, they usually implement

the type of system that is common in the neighbourhood. As with the house location decisions, there is not a significant difference between the decisions and motives of low energy users and high energy users:

(R5 LOW) I also paid attention to find a home that had natural gas connection for general heating and water heater system. I believe that natural gas is much more comfortable as it is impossible to heat the water and all the rooms with an air conditioner

In Turkey, vehicles are usually important assets, especially for males. Therefore, the choice of one's car is considered to be one of the significant decisions. Based on its effects on the energy consumption and energy behaviours, the choice of vehicles is analysed under the life decisions heading. Mostly, due to the restrictions brought about by the lifestyles, comfort, and convenience, respondents do not associate the decision on selection of a car with energy savings, emissions, or environmental considerations. Some respondents also point out the lack of tax incentives that would stimulate such considerations:

(R8 HIGH) I have not considered to buy a car consuming less fuel, because small cars are not suitable for my job

(R7 LOW) While I am driving the car, I don't think about the carbon emission of the vehicle. However, when I first bought the car, I paid attention to the exhaust emission of the vehicle

(R2 HIGH) I send my car to vehicle maintenance and control once every six months. I always think about environmental pollution. Comfort and environmental concerns are much more important for me. From my point of view, comfort is more important with respect to car while environmental issues are more important in terms of house.

As expected, the discussion on energy, environment and vehicles is associated with electric vehicles. Respondents emphasize the high costs and lack of charging infrastructure as barriers for deciding on the purchase of an electric vehicle:

(R8 HIGH) A qualified electric car is too expensive in Turkey. It is around EUR 130.000 or EUR 140.000. No one wants to buy an electric car which is more expensive while they have an access to cheaper diesel or gasoline-powered vehicles.

(R7 HIGH) In fact, my first priority is to buy an electric car. If there is sufficient infrastructure for electric vehicles and their prices are affordable, I will definitely start to use an electric car

Reflection on energy and climate aspects

Regarding the role of energy saving, environment and climate change have on lifestyle and decision-making mechanisms, there are opposing views. However, these are usually not possible to be attributed to LOW or HIGH lifestyles.

The first point of debate is on the extent to which individuals may contribute to energy saving, environment and climate goals. Some respondents take the optimistic approach and argue that every effort counts towards the overarching targets:

(R4 HIGH) I believe that I am an environmentalist person. I also pay attention to my wastes. For example, I put the packaging waste into my pocket outside if there is no bin. Moreover, I don't prefer deodorant as it is harmful for ozone layer

(R5 HIGH) Personally, I pay attention to environmental protection. For example, I never throw my wastes away to the street. Yet, my current living conditions are not suitable to make a further energy saving. I have to drive my own car as I cannot use public transportation vehicles with my new-born baby. After taking some courses on energy at the university, my level of awareness increased to a great extent.

R4 LOW) Maybe we cannot see our personal contribution to the environmental protection, but it will have great support at the collective level. At least, using LED lighting system, buying A++ domestic appliances, unplugging the charging device when we don't use it and closing down the windows while the air conditioner is on help environmental protection to a great extent.

(R3 LOW) I feel very sad about climate change and environmental pollution and I make an effort to contribute the combat with climate change. For example, I pay attention to separate my wastes

(R6 HIGH) I am angry with people that throw their plastic wastes and garbage away to the seaside. On this issue, I warn everyone to pay attention to protect the environment. For example, we like camping and we go to a camping site in a coastal district. Before going back, we always collect the glasses and plastic wastes in the camping site.

On the other hand, many respondents believe that, the energy saving, environment and climate considerations need to be handled on a collective scale rather than based on isolated individual attempts. They argue that, only in such case, there is a chance of making a difference. Some of the supporters of this idea place the responsibility on enterprises that consume high amounts of energy, or think that the policy makers, such as municipalities should take the lead through incentives and legislations. These are mostly the high energy consumers:

(R6 LOW).... They are not the only responsible for such pollution. I believe the whole world is responsible for the environmental pollution

(R3 HIGH) Energy saving, environmental issues and environmental protection are surely significant concepts. However, I believe that these concepts are more prioritized when they are taken into account in collective level rather than individual level. Instead of my individual contribution, the municipalities and government should take more actions on these issues to make further contribution

(R9 HIGH) I believe that industrial transformation in energy-related issues will contribute a lot to the combat of climate change and environmental issues. In this regard, the use of electricity should be increased in industry and heating systems.

(R5 HIGH) The conditions are not suitable in Turkey right now for this transformation. I think the government should provide more incentives.

The common point of agreement by the decision makers is that Turkey is lagging behind in terms of prioritizing energy saving, environment and climate considerations. There are several reasons attributed to this issue, such as financial considerations, legislations, lack of awareness, lack of education. High costs and long return on investment periods also play significant roles:

(R9 HIGH) The legal procedures also constitute important barriers against these kinds of projects.

(R4 HIGH) I think these are all stemming from the fact that Turkey is a traditionalist country. Unfortunately, we are not open to change. This is the major handicap. These procedures are not hard in other countries.

(R1 HIGH) We also planned to install solar panels on our rooftop, but they were not advantageous in terms of tax and legal procedures. Moreover, return on investment period takes 10 to 15 years for rooftop solar systems in Turkey.

(R7 HIGH) This is mostly based on culture. I believe that education should start within the family rather than at school. For example, closing the water tap while brushing teeth is really important for a child. From my point of view, parents should make more effort to educate their children.

Moreover, when the issue on environmental awareness is raised, asking for the role of environmental considerations in their lifestyles and decision-making mechanisms, the respondents mostly relate this with separating waste by their type, or recycling. This type of behaviour is also affected to a high extent by personal awareness as well as habits:

(R1 HIGH) I have been paying great attention to carbon footprint or environmental footprint for nearly 20 years. For example, we always separate our wastes in our home and prioritize recycling

(R1 LOW) I also follow the related pages on the social media [regarding air pollution and climate change]. As a family, we are all aware of high carbon emission level, global warming and climate change. However, we are not good enough at taking an action to combat climate change

There are practices in the behaviours and decisions of the individuals that can be perceived as pro-environmentalist. Respondents have provided examples of such behaviour, however, in most cases they claimed that these are not motivated by environmental or sustainability considerations; they are rather influenced by personal financial factors, convenience and personal choices:

(R3 HIGH) Yes, I have a real concern about the depletion of natural resources. I think this concern is much more important than money. However, as for ferry, I also consider financial issues besides environmental concerns. For example, I want everyone to use marine transportation to reduce traffic jam.

(R4 HIGH) I replaced the old lighting system with LED lights ... Such replacement was based on my awareness and preferences. When I changed the lighting system, I took the economic factors into account. It was not about consuming less energy. I don't like white light; therefore, I preferred a yellow LED system.

(R8 HIGH) ... there are not any environmental factors [in my decisions], but if I can buy a new car, I will definitely buy an electric car. I try to adapt to the modern world

(R5 LOW) At home, I never think about negative environmental consequences of the air conditioner or natural gas. However, I pay great attention to environmental issues outside. For example, I never throw away my garbage or waste on the road. My brother always leaves the charging devices plugged in, but I unplug them all the time as it still consumes electricity as plugged in. Furthermore, I always turn the lights off although he leaves them on.

On the LOW consumers' side, this type of behaviour is sometimes significantly affected by the financial considerations as the major factors. On the HIGH consumers' side, the main determinants are financial factors, time, and comfort.

(R7 LOW) Personally, I don't care about wasting. Instead, I mostly take the economic concerns into account... . To be honest, as for my own decisions, energy consumption, wasting and energy saving are the last points that come to my mind

(R4 LOW) I use LED lighting system in my home to make energy saving... I know they are more expensive, but you can make profit and energy saving in the long run

(R6 LOW) I forced my parents to buy an A++ air conditioner. In this way, we could reduce our electricity bill to a great extent

(R8 HIGH) It is not my preference to drive a car all day long and to have flights nearly 50 or 60 times in a year, but there are all caused by my job. This means I have to do them. I am surely aware of energy saving, environmental issues and climate change

(R1 HIGH) From my point of view, saving of time is the major factor with respect to my energy-related decisions.... I also consider environmental issues and carbon footprint. Environment is a priority in my life as I have awareness on these issues. I can even put environmental concerns at the second place rather than economic factors. I also consider comfort.

(R6 HIGH) ... these complaints are all about financial concerns. People do not care about to what extent environmental pollution is avoided

Summary of focus group results in Turkey

The two focus groups demonstrated results that are in line with the expected stereotypes of high and low energy users. The analysis was based on the framework that segments the energy lifestyles into everyday routines, leisure time and vacation, and life decisions

There appears to be correlations between age, social status, income levels and energy consumption patterns. Interestingly, education level does not seem to be a determinant for membership in one of these groups.

In terms of everyday routines, two main determinants of the energy consumption patterns are choices regarding the driving habits and transportation. As expected, people in the high energy consumers group drive their private vehicles everyday intensively. These are generally single-person drives. The main foremost reasons behind this behavioural pattern are stated as time savings, comfort, and convenience. Energy saving, environment and climate change considerations are not cited by high energy consumer respondents as discouraging or supporting factors. Low energy consumers do not have driving as part of their daily routines. These people generally use public transportation instead. Low energy consumers choose public transport primarily based on cost considerations or the fact that they do not own private vehicles, which refers to their social status or income level. It is worthwhile to note here that high energy consumer respondents almost never use public transport, nor practice carpooling since they do not find these convenient or secure.

Several other components of the everyday routines are affected by household-associated issues such as those related with the usage patterns of electric devices, heating and cooling appliances, or kitchenware. Parallel to the earlier findings, high energy users have higher consumptions in this regard, and pay less attention to energy savings. This behaviour is not a result of being unaware of the downsides, however high energy consumers usually do not take the steps to change their behaviours. Other than prioritizing comfort and convenience, important factors leading to this situation are having children or pets and family routines. Low energy consumers are not separated from high energy consumers in this regard. In their everyday routines, low energy consumers do not pay much attention to energy savings. As different from the high energy consumers, low energy consumers have more motives to reduce their energy consumptions. One main factor here is the cost of energy. Other than that, low energy users are generally dependent on other members of the family or parents regarding these decisions.

Concerning leisure time and vacation behaviours, the high energy consumer group and the low energy consumer group have similar patterns. The main reason for this phenomenon is that high energy consumers tend to act more or less similar to their daily routines, continuing to be high energy users, whereas low energy consumers are more relaxed in terms of energy consumption, caring about energy efficiency and waste, in their leisure times and vacations as compared to their daily routines, converting them to high energy consumers at these times.

Regarding the longer term life decisions, the issues raised can be grouped under two main categories. The first one is related with the choice of the house and its heating-cooling infrastructure. The second one is related with the choice of the vehicle. The latter is a significant factor particularly for Turkey, since in Turkey vehicles are usually very important assets, especially for males.

The choice of the house or the location of the house does not demonstrate big differences between high energy consumers and low energy consumers. At this point, the main consideration for most the respondents is ease of access to workplaces. However, this translates into accessibility by private vehicles for high energy consumers and to proximity to public transport infrastructure for low energy consumers seek for. Obviously, some low energy consumers do not really have a choice here, since they do not have a say in the decision on the location of the house. About the choice of the heating-cooling systems of the house, the main drivers are convenience and availability. That is, the respondents go with the type of system that is common in the neighbourhood.

For decisions regarding the selection of a car, the factors such as restrictions brought about by the lifestyles, comfort, and convenience kick in once again. At this point, the respondents do not associate the decisions with energy savings, emissions, or environmental considerations.

In general, regarding the role of energy saving, environment and climate change have impacts on your lifestyle and decision-making mechanisms, there are opposing views in both high energy lifestyles and low energy lifestyles: Some respondents believe that individuals may contribute to energy saving, environment and climate goals and every effort counts towards the overarching targets, whereas many respondents believe that, the energy saving, environment and climate considerations need to be handled on a collective scale rather than based on isolated individual attempts. Some of the supporters of this idea, who are mostly the high energy consumers, place the responsibility on enterprises that consume high amounts of energy, or think that the policy makers, such as municipalities should take the lead through incentives and legislations.

The common point of agreement by the decision makers is that Turkey is lagging behind in terms of prioritizing energy saving, environment and climate considerations. There are several reasons attributed to this issue, such as financial considerations, legislations, lack of awareness, lack of education, high costs and long return on investment periods

There are practices in the behaviours and decisions of the individuals that can be perceived as pro-environmentalist. Respondents have provided examples of such behaviour, however, in most cases they claimed that these are not motivated by environmental or sustainability considerations; they are rather influenced by personal financial factors, convenience and personal choices.

Driving-factors from a mixed methods perspective: Focus group findings and ECHOES survey results Turkey

In the following, the results from the quantitative survey and the qualitative focus group discussions in Turkey are brought into relation. The structure is provided by the driving factors that could be identified quantitatively, and by the energy impact patterns of the HIGH and LOW energy lifestyle groups visualised in Figure 11.

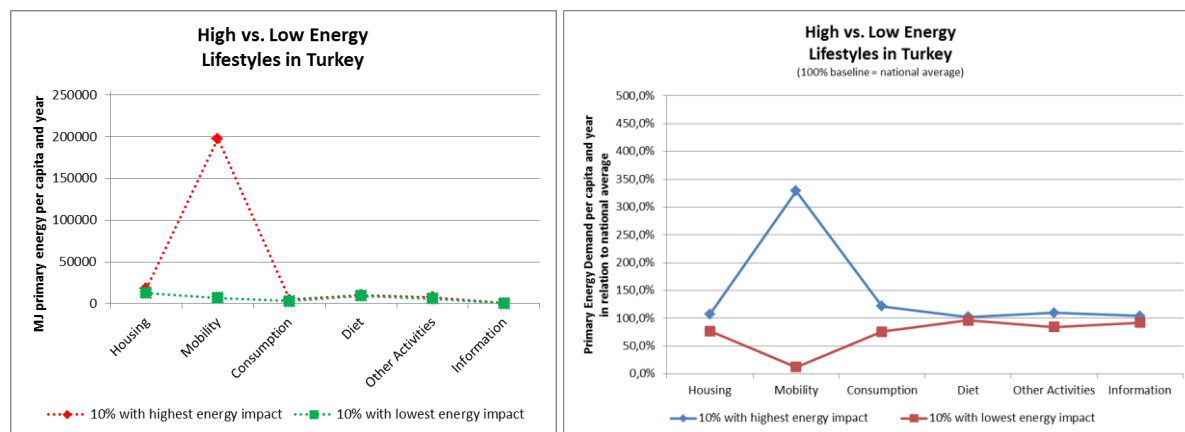


Figure 11: Energy demand profiles of people with HIGH and LOW energy lifestyles in Turkey. Absolute values (left) and relative to national average (right).

Driving factors for Membership in HIGH group:

Women have a significantly higher probability to be part of the HIGH group (Odds-Ratio 1.956)

People with a higher social status have a higher probability to be part of the HIGH group

Driving factors for Membership in LOW group:

People who live in larger households are more likely to be LOW group members

People who have children under 14 are less likely to be LOW group members (Odds-Ratio .311)

People with higher education are less likely to be LOW group members (Odds-Ratio .511)

People with a higher social status are less likely to be LOW group members

People with a high environmental identity have a higher probability to be part of the LOW group

People who live in larger households are more likely to be LOW group members

The focus group results are in line with the quantitative results regarding the size of households. Participants from the low energy consumption group are more likely to live with their families, as the 'dependent' part of a larger household. On the high energy consumers' side, the household size is generally two people, sometimes three (with the inclusion of a dependent child), sometimes one because of spouses living in different cities or travelling very frequently for business purposes.

People with higher education are less likely to be LOW group members

As the quantitative results suggest, the evidence in the focus groups verify that people with higher education were more likely in the high energy consumer group, whereas such people are less likely to be in the low energy consumer group.

People with a higher social status are less likely to be LOW group members and People with a higher social status have a higher probability to be part of the HIGH group

There is also a parallelism between the quantitative survey results and the focus group results in terms of the relationship between the social status and energy consumption. Both results point to a higher social status for high energy consumption group members. These people are likely to prioritize time savings, comfort, convenience much more than energy savings. Hence, people with a higher social status are less likely to be in the low energy consumption group. A somehow similar and correlated evidence from the focus group results shows that people with a regular job – regular income are more likely to be in the high energy consumer group.

With regard to the remaining (quantitatively determined) driving factors, no conclusion could be made on the basis of the qualitative focus groups.

3.2.3. Conclusions from the mixed-method approach on “high” and “low” energy lifestyles

In the following sections, a cross-national discussion of the focus group results will be presented before the links between focus group results and quantitative findings are summarised. Finally an overview of potential consequences for policy design is given.

Cross-national discussion of focus group results

The area of **mobility**, which is mainly responsible for the energy intensity of both HIGH and LOW energy lifestyles in the quantitative ECHOES survey in all countries surveyed, shows the following pattern across the focus groups of all countries:

The HIGH groups use different forms of mobility in everyday life - walking, bicycle and public transport - if they live in inner-city areas. However, regular car driving dominates. Without exception, the HIGH groups are particularly energy-intensive when on holiday: air travel dominates, mostly several times a year, both within Europe and overseas. Air travel is usually supplemented by car travel. Energy-intensive leisure activities (e.g. skiing abroad) are also part of this pattern.

The LOW groups show a clear tendency to use public transport in everyday life across all countries, but mainly for cost reasons and not for environmental reasons, and they only partly use cars. On holiday, however, LOW breaks with this everyday behaviour and also travels by plane and car in most countries. However, it can be seen that (long-distance) travel is less frequent and that there is a certain tendency to go on holiday in one's own country. The need for mobility is therefore very high both in everyday life and in leisure time in both HIGH and LOW groups.

As far as leisure mobility is concerned, there is a strong personal dichotomy between existing climate awareness on the one hand and the commitment to (climate-damaging) travel on the other. It is interesting that no bad conscience is created by this. As far as climate awareness is concerned, both groups are clearly aware of the emission liability of long-haul journeys. But, even for the LOW group, this travel is still an indispensable part of their lifestyle and do not fall victim to any considerations. The HIGH Groups don't show any considerations, the extremely high consumption of resources through above all mobility is regretted guiltily, but corresponds to the attitude of life.

The following explanations were provided, e.g.: Flying less, but "consciously" (LOW in Austria, Norway); long-haul journeys as an indispensable part of one's own (consumer) culture ("one lives only once"; HIGH, LOW in Austria, Norway); one passenger more or less does not matter (Norway, Turkey); the journey is compensated by other environmentally friendly behaviour (Turkey).

Strong factors in the choice of mobility are costs, time savings and comfort. As country-specific cultural peculiarities regarding mobility, we could mention the great importance of travelling to home towns and rural secondary residences in Bulgaria, and the great importance of the car as a male prestige object in Turkey.

At the aggregated level, the ECHOES survey identified the influence of **personal obligations** in Austria, Spain and Norway, and again in Austria and Norway when looking at the sub-groups. The trends that were observed in the focus groups pointed in the same direction, namely that people with higher personal obligations are less likely to belong to the HIGH group.

The focus groups in Austria and Norway indeed showed a clear ethical responsibility. Ethical responsibility weighs heavily in these countries, with climate and energy being only one of the ethical areas and only seldom guiding action. Fairness in production or reduced meat consumption for animal welfare reasons are equally important and influence choosing e.g. groceries, consumer goods or clothes. In Austria the strong ethical responsibility was only apparent in the LOW group - in contrast to the HIGH group. As in Austria, in Italy the HIGH energy group shows a lack of sense of community, while this sense of community is clearly visible in the LOW group especially regarding environmental behaviour.

Comfort orientation guides action through the focus groups of all countries, namely HIGH and LOW (whereby LOW is consistently more influenced by economic considerations). In Italy, comfort orientation is the primary motivation of all pro-environmental and anti-environmental choices, both in life decisions and in mobility. In the residential sector, for example in Turkey or Bulgaria, summer air conditioning is a comfort feature that is hardly questioned. Comfort orientation (and a clear commitment to it) also dominates in Norway, both in terms of mobility/travel and the form of living, even if it is not sustainable. The inconvenience of public transport in Bulgaria is not accepted for environmental reasons, but for economic reasons. The comfort of being able to cover all distances within walking distance in inner-city areas is regarded as a sign of quality of life.

Especially in Austria, Turkey, Norway the focus groups report in the different thematic areas on personal activities in the environmental field, which often have no or comparatively little relevance for energy or climate problems (waste separation, water saving, plastic reduction, energy-efficient air conditioning, switching off lights, recycling, energy-saving lights, sailing on holiday.....). These activities are partly deliberately cited as "compensation" for energy-intensive behaviour elsewhere (by HIGH groups), but also as "**symbolic action**" for voluntary everyday behaviour. In the different context of LOW groups, however, these activities may also be interpreted as "showing the will to transition" (Norway).

The consumer orientation of society was discussed in several focus groups in several countries and criticized in LOW groups. In Austria, **criticism of consumerism** took place and was contrasted with "sufficiency"; "sufficiency" interpreted by HIGH as kind of voluntary renunciation, because one could also afford consumption. While LOW said that the same purpose could also be achieved by different means. In Italy, consumption/resource consumption, and how to judge it, was generally seen as a question of culture and education. Also in Norway and Austria, the importance of education and childhood experiences as an essential basis of later attitudes towards the environment and consumption was mentioned (in HIGH like LOW groups).

In none of the focus groups are energy-relevant considerations relevant or even decisive for the **choice of accommodation** or living place. In most countries, the choice of accommodation is primarily a question of a favourable location in relation to the workplace or favourable traffic situation. For the LOW groups, the decisive selection criteria are the housing costs or the possible savings of other costs (e.g. mobility costs).

Especially when it comes to housing, there are country specifics: In Bulgaria, the share of residential and house ownership is high, the real estate is often inherited, and this ownership restricts the flexibility of housing choice. In Turkey, a number of focus group participants live in family groups, which means that they are dependent on others for equipment and energy-related household decisions. In Norway, the type of living (ownership) is a cultural element, home ownership being a symbol of the family.

Who is responsible for energy-conscious action? What is the **role of the individual**, what is the **role of the public**? This question was intensively discussed in the focus groups of some countries. In general, it can be seen that the HIGH groups attribute the main responsibility to the public sector and politics.

In Turkey, HIGH emphasises the responsibility of politicians, but also of companies, for climate protection. The deficiencies are presumed to be rooted in cultural reasons and are seen as a sign of a lack of development and education. In Bulgaria, there are complaints about inconsistent policies, inadequate economic incentives and the poor example set by the public administration in saving energy. The political level has the responsibility and possibility to change measures. It is also argued in Italy that public administration and politics lack clear energy relevant actions, especially in the field of housing, and that responsibility is assigned to the individual. There is a certain "helplessness" regarding the effect of the individual's action against environmental problems, which leads to discouragement at LOW because of insufficient legislation, and rejection of responsibility at HIGH. Also in Norway LOW, but also HIGH argued that "the system" is often stronger than the individual and the actions of the individuals in the sense of social fairness have to be supported by political action.

It was evident across all focus groups that the degree of awareness of the need for increased energy efficiency and climate protection is high. This is a topic that is being recognized by the individual. However, although - in the

LOW groups - a commitment to responsibility was also expressed it can be stated that **in none of the countries by none of the focus groups (HIGH or LOW) any concrete willingness to change their energy behaviour was expressed.**

Costs are stronger motivations than environmental considerations for LOW groups, both with regard to the choice of mobility and housing, even if energy efficiency and climate protection are affirmed and conscious factors. It can be seen that across the LOW and HIGH groups, the **factors cost and comfort are decision-relevant for the adoption of more environmentally friendly behaviour, and energy/climate relevance are of secondary importance.**

Cross-national discussion of links between qualitative and quantitative findings

With regard to summarising the links between quantitative findings and focus group results, it must be emphasised in advance that the influences of socio-demographic factors in particular could only be considered in depth to a limited extent within the focus groups. This circumstance is partly caused by a recruitment bias. In addition to their answers in the online quick survey, the composition of the groups was largely determined by the availability of potential participants for the "high" and "low" impact groups at the proposed dates. Consequently, the complementarity between qualitative and quantitative findings can be expected to be most meaningful for in-depth analyses of country-specific features such as the role of **"personal obligation" in Norway** or the fact that **gender** plays a role for lifestyle energy intensity in **Austria and Italy, but not in the remaining countries.**

As it was already discovered in the quantitative assessment, the combinations and in some cases also the mechanisms of driving factors that lead to "high" or "low" energy lifestyles are highly country-specific. While climatic and geographic conditions were mentioned to be the cause of between-country variation to a certain extent (see chapter 3), country specific characteristics that can be related to national Energy Cultures (Stephenson et al., 2010) or Energy Memories⁷ (which takes national key-events and the respective collective memory explicitly into account) are considered to play a particular role with regard to such specific driving factors. As has been shown particularly in the course of the mixed methods approach, significant driving factors can be determined quantitatively, which allows an estimation of their effect size. However, an exact understanding of the mechanisms between a certain driving factor and its role in terms of energy behaviour/impact can often only be developed by taking detailed knowledge about the respective country and its historical and cultural background into account.

The role of "high" and "low" energy lifestyles for policy design

The underlying idea of focusing on lifestyles with a particularly high or particularly low energy demand is based on the question of how such different lifestyle energy intensities can emerge under almost identical conditions. The identification of already existing "low impact" groups proves that resource-saving lifestyles already exist today, which is an **opportunity to get rid of the utopian stigma of such lifestyles.** Their analysis helps to identify starting points for **target-oriented policy design.** At the same time, "high impact" groups illustrate which seemingly **small differences** in the realities of people's lives can **trigger a manifold increase in primary energy demand.**

In view of the extreme differences that occur between "high" and "low" energy impact lifestyles in the area of mobility, it seems obvious from a conventional, sector specific point of view to bundle all policy-effort on this area. However, research shows that measures focussing exclusively on one particular sector or area of life are at risk of falling short of expectations due to insufficient consideration of systematic links on lifestyle-level. This holistic picture, covering different areas of life, is a central feature of impact-based energy lifestyle research. Its full potential is therefore particularly evident when the identification of those driving factors that lead to *specific patterns of behavioural impacts is required.* A part of this potential has already become apparent in the **different impact patterns of "high" impact and "low" impact lifestyle groups.** However, the impact-based approach can achieve its full potential in particular if not only the distinction between "high" impact and "low" impact lifestyles is of interest,

⁷ The concept of „Energy Memories“ was developed in another task of the ECHOES project and reported in D5.2. Available online: <https://www.echoes-project.eu/sites/echoes.drupal.pulsartechnalia.com/files/D5.2.pdf> (last accessed: December 19, 2018)

but an understanding of the driving factors behind relevant energy behavioural patterns of entire societies is to be developed.

3.3. Cross-European Identification and Assessment of Energy Lifestyles

In the following, the results of the Cross-European Energy Lifestyles identification and assessment are reported. Methodologically, the research was conducted according to the impact based approach (Schwarzinger et al., 2018), as described in chapter 2. In the first step, the respondents are classified into groups on the basis of their estimated primary energy demands in the six main areas of life using cluster analysis. Before clustering, the primary energy demands of the individual areas were ordinalised into 10 steps with an equal number of cases. For clustering, the k-means algorithm was used and the number of groups was varied until a reasonable balance between number of groups and interpretability was established.

The energy impact profiles of the six identified groups (Figure 12) already indicate that the patterns of energy behaviour differ significantly between the groups.

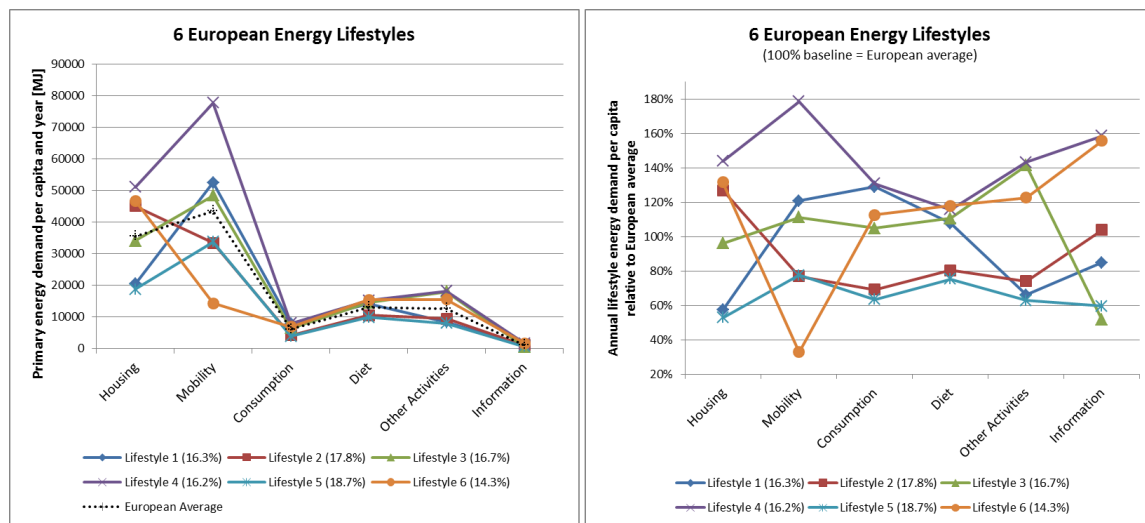


Figure 12 Primary energy demand profiles of 6 European energy lifestyles: absolute (left) and relative to the European average (right)

In a second step, the six identified groups will be characterised on the basis of their socio-demographic characteristics and under consideration of their typical behaviour and equipment use in order to enable the interpretation of the group level analyses.

3.3.1. Energy Lifestyle 1 (16.3%) Characteristics

As depicted in Figure 13, Energy Lifestyle 1 is overrepresented in, but not limited to south- and southwestern Europe.

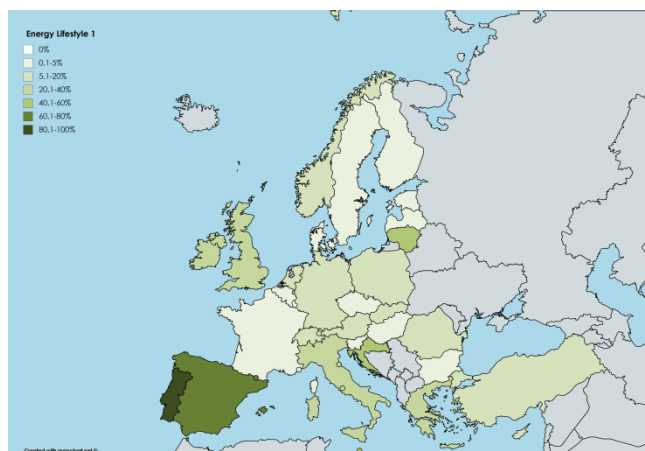


Figure 13 Regional distribution of Energy Lifestyle 1 across Europe

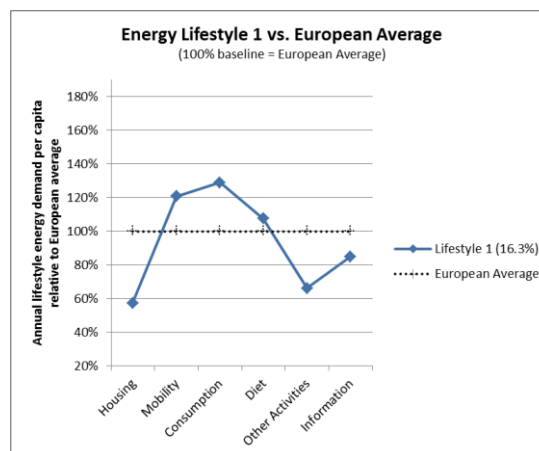


Figure 14 Energy Demand Profile of Energy Lifestyle 1 in relation to the European Average

Respondents with Lifestyle Type 1 tend to have a **higher level of education** and often describe their **social status as "average"**. At 22.9%, the proportion of people living in **cities is significantly lower** than in the 31-country average (30.5%). The **age group from 35 to 44** is overrepresented in this sub-group, as are people who are either **self-employed or work 30 or more hours a week**. **Women are overrepresented** in this group (Table 6).

Table 6 "Situation" of Lifestyle 1 respondents

Situation	Regional representation: Overrepresented in South- and Southwestern Europe
	Representation of age groups: 35-44 overrepresented
	Gender ratio: 46.7% men, 53.3% women
	Household size: Overrepresentation of respondents living in households of 3 or more people
	Living environment 22.9% live in rural regions
	Education Overrepresentation of respondents with university- or college-degrees
	Social status Overrepresentation of respondents who describe their status as <i>average</i>
	Employment Overrepresentation of respondents who are <i>self-employed</i> or <i>employed 30h/week and above</i>

With an average overall lifestyle related energy demand of 104 Gigajoule, respondents with Energy Lifestyle 1 are slightly below the European average of 112 Gigajoule. Characteristic of this group is in particular the **low heating energy demand**, which dominates the area **Housing** (Figure 14). It results from a tendency to smaller living space per capita, a large proportion of dwellings in blocks of more than 10 units and the frequent use of biomass heating systems. The low demand for heating energy is also supported by a regional concentration in southern and southwestern Europe. With regard to **Mobility**, **Lifestyle 1 respondents drive more** (approx. 13000km/year) than the 31-country average (approx. 11000km) and fly slightly more than the average European (Table 7). With regard to carsharing, Lifestyle 1 is the group with the largest shares of respondents who have either **tried and liked**

carsharing (10,9%) or **not tried carsharing but are interested (44,4%)**. At the same time, respondents who **almost never bike to work or shopping** are overrepresented. In terms of **consumption**, Lifestyle Type 1 has a noticeable **preference for new and fashionable products** in electronics and fashion. In terms of **Diet**, respondents are overrepresented who either eat **meat occasionally** or eat **no meat but fish**. Lifestyle 1 members often have **leisure activities that require little equipment and infrastructure**, as well as information behaviour in which the use of electronic media is just below the 31-country average (Figure 14, Table 7).

Table 7 Energy related "Performance" of Lifestyle 1 respondents

Performance	<p>Overall Lifestyle Energy Demand: approx. 104 Gigajoule</p> <p>Housing: Living space of 20,1-30m² per capita overrepresented, mean 32.0m² Flats in blocks up to 10 dwellings overrepresented Biomass as heating fuel overrepresented</p> <p>Mobility: Overrepresentation of respondents driving 10000-15000km/yr., mean 13363km Overrepresentation of respondents who drive Diesel and Plug-in Hybrid vehicles Overrepresentation of respondents flying <3 and 3-6 hours/yr., mean 5.9h Overrepresentation of respondents who have not tried carsharing yet, but are interested Overrepresentation of respondents who <i>almost never</i> bike</p> <p>Consumption Overrepresentation of respondents who purchase new clothes <i>quite often</i> or prefer <i>always the latest style</i>. Overrepresentation of respondents who are either <i>about average</i> in purchasing electronics, or who buy new equipment <i>regularly</i>, or who like to <i>always have the latest technology</i>.</p> <p>Diet Overrepresentation of respondents who either eat meat in <i>some</i> meals only or who eat no meat but fish.</p> <p>Leisure Overrepresentation of respondents with leisure activities that require <i>very little</i> equipment and infrastructure.</p> <p>Information Overrepresentation of respondents who use electronics <i>about average</i>.</p>
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3.3.2. Energy Lifestyle 2 Characteristics

As depicted in Figure 15, Energy Lifestyle 2 is overrepresented in, but not limited to the eastern parts of Europe.

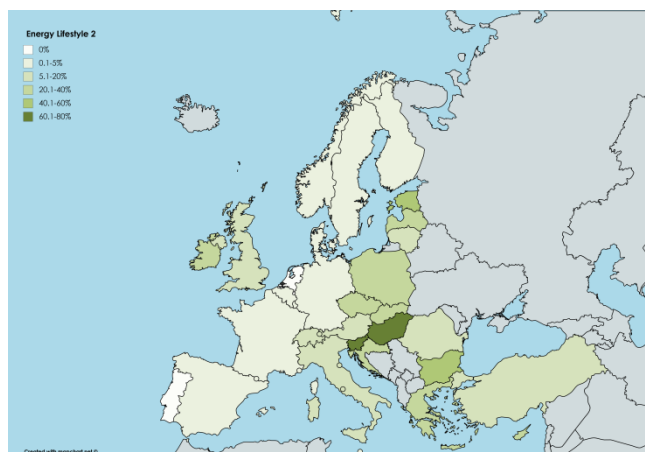


Figure 15 Regional distribution of Energy Lifestyle 2 across Europe

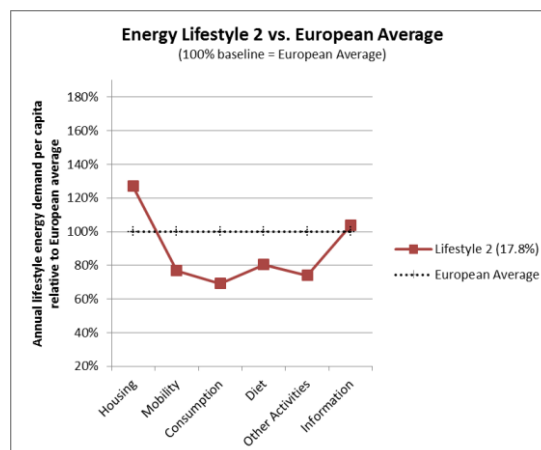


Figure 16 Energy Demand Profile of Energy Lifestyle 2 in relation to the European Average

In the group identified as Lifestyle Type 2, respondents with **university entrance qualification** as highest level of education are overrepresented. They often describe to have an **average or below average social status**. With 35.2%, the share of respondents who live in **rural areas is above the 31-country average (30.5%)**. The **age group 55+** is overrepresented in this sub-group, as are people who are either employed less than 30 hours a week or who are retired. **Women are overrepresented** in Lifestyle Type 2 (Figure 16, Table 8).

Table 8 "Situation" of Lifestyle 2 respondents

Situation	<p>Regional representation: Overrepresented in North-Eastern to Southeastern Europe and Turkey</p> <p>Representation of age groups: 55+ overrepresented</p> <p>Gender ratio: 47.3% men, 52.7% women</p> <p>Household size: Overrepresentation of respondents living in households of 2 people</p> <p>Living environment 35.2% live in rural regions</p> <p>Education Overrepresentation of respondents with <i>A-level exams</i> or <i>other</i> educational levels</p> <p>Social status Overrepresentation of respondents who describe their status as <i>average</i> or <i>below average</i></p> <p>Employment Overrepresentation of respondents who are <i>employed <30h/week</i> or <i>retired</i></p>
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With an average overall lifestyle related energy demand of 104 Gigajoule, respondents with Energy Lifestyle 2 are, as the above described Lifestyle 1, slightly below the European average of 112 Gigajoule. Characteristic of this group is in particular the **below average energy demand in Mobility, Consumption, Diet and Leisure**. The above average energy impact in the area of **Housing** results from an overrepresentation of **single family homes and farmhouses**. With 42m², the living area per capita is close to the 31-country average of around 40m². The below average energy demand in **Mobility** results from a **relatively small driving distance**, and a **relatively small number of flight hours**. Lifestyle 2 respondents are **indifferent with respect to carsharing**, and respondents who **bike rarely, sometimes, or only during summer** are overrepresented. In terms of consumption, Lifestyle 2

members can be characterised as are **relatively frugal**. In the area of Diet, **vegetarian and vegan** respondents are overrepresented. Regarding **Leisure** activities, Lifestyle 2 respondents often stated to be engaged in activities requiring **very little equipment and infrastructure**. However, in the area of **Information** respondents who use electronics **intensively or very intensively** are overrepresented. (Table 9)

Table 9 Energy related "Performance" of Lifestyle 2 respondents

Performance	<p>Overall Lifestyle Energy Demand: approx. 104 Gigajoule</p> <p>Housing: Living space between 30,1 and 50m² per capita overrepresented, mean 42.0m² Single-family homes and farmhouses overrepresented Biomass as heating fuel overrepresented</p> <p>Mobility: Overrepresentation of respondents driving 0-5000km/yr., mean 9.115km Overrepresentation of respondents who drive Petrol vehicles Overrepresentation of respondents flying 0 hours/yr., mean 2.7h Indifferent with respect to carsharing Overrepresentation of respondents who <i>rarely</i> or <i>sometimes</i> bike, or only bike during summer</p> <p>Consumption Overrepresentation of respondents who describe their fashion preferences as <i>modest</i>. Overrepresentation of respondents who prefer a <i>long use</i> of electronics and replace equipment <i>only if it is broken</i>, and of respondents who stated that they <i>do not need most of it</i>.</p> <p>Diet Overrepresentation of vegetarian and vegan respondents.</p> <p>Leisure Overrepresentation of respondents with leisure activities that require <i>very little</i> equipment and infrastructure.</p> <p>Information Overrepresentation of respondents who use electronics <i>quite intensively</i> or <i>very intensively</i>.</p>
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3.3.3. Energy Lifestyle 3 Characteristics

As depicted in Figure 17, Energy Lifestyle 3 is overrepresented in, but not limited to the northern, western and central parts of Europe.

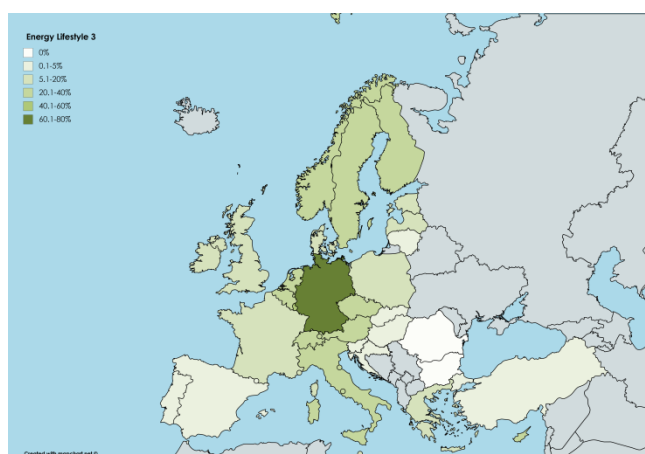


Figure 17 Regional distribution of Energy Lifestyle 3 across Europe

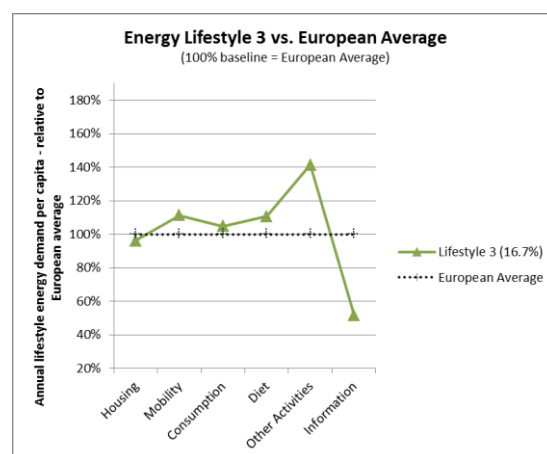


Figure 18 Energy Demand Profile of Energy Lifestyle 3 in relation to the European Average

In the group identified as Lifestyle Type 3, respondents with **professional training** as highest level of education are overrepresented. They often describe to have an **above average social status** or to be **best off** with regard to their social status. With 37.6%, the share of respondents who live in **rural areas is above the 31-country average** (30.5%). The **age group 45-54** is overrepresented in this sub-group, as are people who are either employed **less than 30 hours a week** or who are **retired**. **Men are overrepresented** in Lifestyle Type 3 (Table 10).

Table 10 "Situation" of Lifestyle 3 respondents

Situation	Regional representation: Overrepresented in Northern-, Western- and Central-Europe
	Representation of age groups: 45-54 slightly overrepresented
	Gender ratio: 54.1% men, 45.8% women
	Household size: Overrepresentation of respondents living in households of 1 or 2 people
	Living environment 37.6% live in rural regions
	Education Overrepresentation of respondents with professional training
	Social status Overrepresentation of respondents who describe their status as <i>above average</i> or <i>best off</i>
	Employment Overrepresentation of respondents who are <i>employed <30h/week</i> or <i>retired</i>

With an average overall lifestyle related energy demand of 122 Gigajoule, respondents with Energy Lifestyle 3 are above the European average of 112 Gigajoule. Characteristic of this group is the **close to average energy demand in Housing, Mobility, Consumption, and Diet, combined with noticeable deviations in Leisure and Information**. The close to average energy impact in the area of **Housing** results from an overrepresentation of **semi-detached/terraced homes**, and a mean of 46m² living area per capita, which is slightly above the 31-country

average of around 40m². The energy demand in **Mobility** results from a **slightly above average annual driving distance**, and a **slightly above average number of flight hours**. **Hybrid, Plug-in Hybrid, and Electric Vehicle users are overrepresented** amongst Lifestyle 3 respondents. Respondents who **tried but not liked carsharing** are overrepresented, as well as respondents who **bike sometimes**, or **during summer**. In terms of **Consumption**, the group average is also close to the 31-country average, but with an overrepresentation of people who prefer a long use of their clothes and electronic devices. In the area of **Diet**, Energy Lifestyle 3 represents a noticeably large share of respondents who eat **meat very rarely**. In the area of **Leisure** activities, however, Lifestyle 3 respondents have an **increased** or even **high demand in terms of equipment and infrastructure**. In terms of **Information**, Lifestyle 3 is characterised by an overrepresentation of **average** or **below average** use of electronic means. (Figure 18, Table 11)

Table 11 Energy related "Performance" of Lifestyle 3 respondents

Performance	<p>Overall Lifestyle Energy Demand: approx. 122 Gigajoule</p> <p>Housing: Living space between 30,1 and 50m² per capita overrepresented, mean 46.4m² Semi-detached/terraced and „other“ homes overrepresented Oil, solarthermals and heat-pumps (air) overrepresented</p> <p>Mobility: Overrepresentation of respondents driving 5000-15000km/yr., mean 12277km Overrepresentation of respondents who drive Hybrid, Plug-in Hybrid or Electric vehicles. Overrepresentation of respondents flying 6-10 and 10-15 hours/yr., mean 6.2h Overrepresentation of respondents who tried but not liked carsharing. Overrepresentation of respondents who bike <i>sometimes</i> or <i>during summer</i></p> <p>Consumption Overrepresentation of respondents who use fashion for long and also use second hand clothes. Overrepresentation of respondents who prefer a long use of electronics and replace equipment <i>only if it is broken</i>, and of respondents who stated that they would <i>not need most of it</i>.</p> <p>Diet Overrepresentation of respondents who eat meat <i>very rarely</i>.</p> <p>Leisure Overrepresentation of respondents with leisure activities that require either an increased amount or even <i>a lot of</i> equipment and infrastructure.</p> <p>Information Overrepresentation of respondents who use electronics <i>about average</i> or <i>less than most others</i>.</p>
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3.3.4. Energy Lifestyle 4 Characteristics

As depicted in Figure 19, Energy Lifestyle 4 is overrepresented in, but not limited to the northern and western parts of Europe.

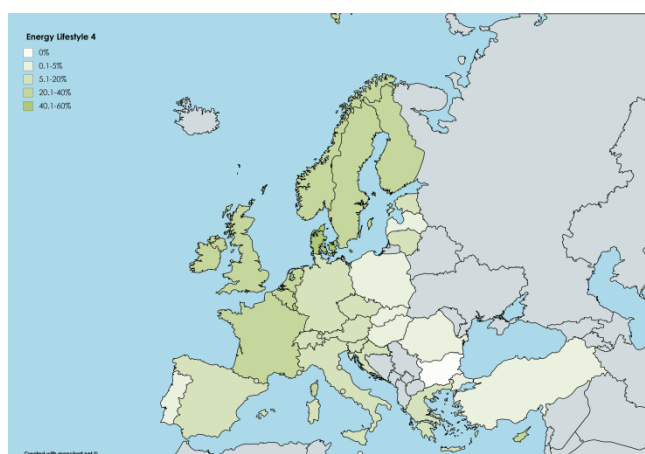


Figure 19 Regional distribution of Energy Lifestyle 4 across Europe

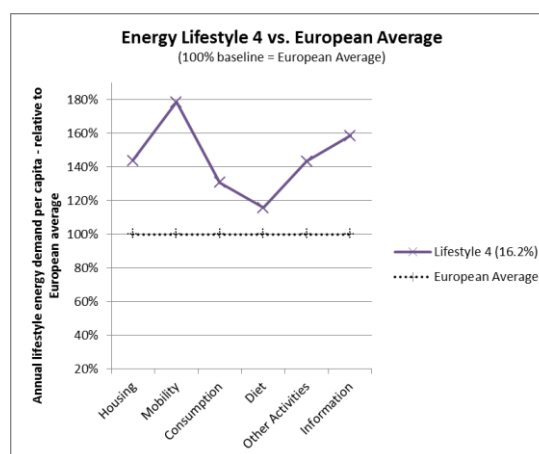


Figure 20 Energy Demand Profile of Energy Lifestyle 4 in relation to the European Average

In the group identified as Lifestyle Type 4, respondents with **university- or college-degrees** are overrepresented. They often describe to have an **above average social status** or to be **best off** with regard to their social status. With 35.8%, the share of respondents who live in **rural areas is above the 31-country average** (30.5%). The **age group 18-34** is overrepresented in this sub-group, as are people who are either **self-employed** or employed for **30h per week or above**. **Men are overrepresented** in Lifestyle Type 4 (Table 12).

Table 12 "Situation" of Lifestyle 4 respondents

Situation	Regional representation: Overrepresented in Northern- and Western-Europe
	Representation of age groups: 18-34 overrepresented
	Gender ratio: 58.5% men, 41.4% women
	Household size: Overrepresentation of respondents living in households of 1 or 2 people
	Living environment 35.8% live in rural regions
	Education Overrepresentation of respondents with university- or college-degrees
	Social status Overrepresentation of respondents who describe their status as <i>above average</i> or <i>best off</i>
	Employment Overrepresentation of respondents who are <i>self-employed</i> or <i>employed 30h/week and above</i>

With an average overall lifestyle related energy demand of 172 Gigajoule, respondents with Energy Lifestyle 4 are far above the European average of 112 Gigajoule, and have the highest lifestyle related primary energy demand of all six assessed groups. Characteristic of this group is the fact that it has the **highest average energy demand in Housing, Mobility, Consumption, Leisure, and Information**, and the **second highest average energy demand in Diet**. The energy impact in the area of **Housing** results from having the **largest living space per capita**, and an overrepresentation of **single family homes** and **farmhouses**. The extraordinary high energy

demand in **Mobility** results from having **the highest annual driving distance**, and a large share of people with a **large number of flight hours**. Similar to Lifestyle 3, also in Lifestyle 4 respondents who **tried but did not like carsharing** are overrepresented. Respondents who **almost never bike** are also overrepresented. The overrepresentation of **Hybrid, Plug-in Hybrid, and Electric Vehicles** does not compensate for the highly extensive mobility behaviour of the respondents. In terms of **Consumption**, Lifestyle 4 respondents have a preference towards buying new clothes regularly, or having **always the latest style** and towards purchasing electronic equipment regularly, or liking to have **always the latest technology**. In the area of **Diet**, Energy Lifestyle 4 represents a noticeably large share of respondents who have **meat in most of their meals**. In the area of **Leisure** activities, Lifestyle 4 respondents tend to have a **moderate to high demand in terms of equipment and infrastructure**. In terms of **Information** behaviour, Lifestyle 4 is characterised by an overrepresentation of **quite intensive or very intensive** use of electronic means (Figure 20, Table 13).

Table 13 Energy related "Performance" of Lifestyle 4 respondents

Performance	<p>Overall Lifestyle Energy Demand: approx. 172 Gigajoule</p> <p>Housing: Living space of more than 50m² per capita, mean 52.3m² Single-family homes and farmhouses overrepresented Oil, solarthermals and heat-pumps (air) overrepresented</p> <p>Mobility: Overrepresentation of respondents driving more than 15000km/yr., mean 17869km Overrepresentation of respondents who drive Hybrid, Plug-in Hybrid or Electric vehicles. Overrepresentation of respondents flying 15-20, 25-30, and more than 30 hours/yr., mean 10.4h Overrepresentation of respondents who tried but not liked carsharing. Overrepresentation of respondents who <i>almost never</i> bike</p> <p>Consumption Overrepresentation of respondents who purchase new clothes <i>quite often</i> or prefer <i>always the latest style</i>. Overrepresentation of respondents who are either <i>about average</i> in purchasing electronics, or who buy new equipment <i>regularly</i>, or who like to always have the latest technology.</p> <p>Diet Overrepresentation of respondents who have meat in <i>most</i> of their meals.</p> <p>Leisure Overrepresentation of respondents with leisure activities that require between <i>moderate</i> and <i>a lot</i> of equipment and infrastructure.</p> <p>Information Overrepresentation of respondents who use electronics <i>quite intensively</i> or <i>very intensively</i>.</p>
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3.3.5. Energy Lifestyle 5 Characteristics

As depicted in Figure 21, Energy Lifestyle 5 is overrepresented in, but not limited to the eastern parts of Europe, and Turkey.

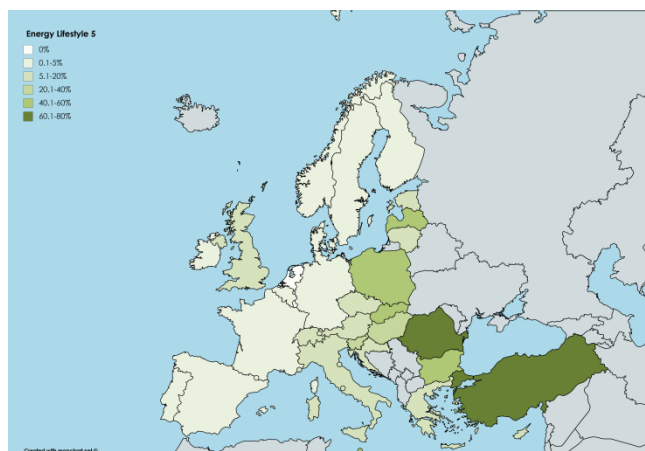


Figure 21 Regional distribution of Energy Lifestyle 5 across Europe

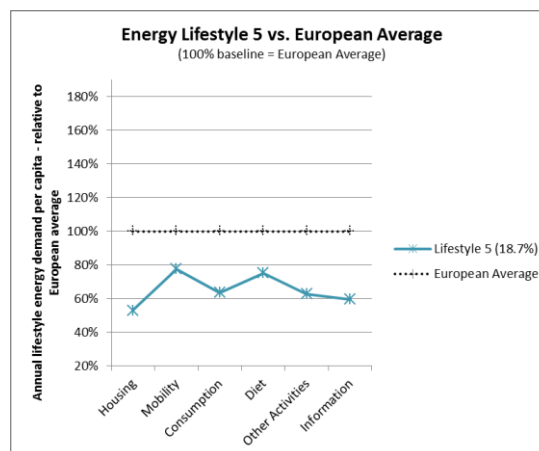


Figure 22 Energy Demand Profile of Energy Lifestyle 5 in relation to the European Average

In the group identified as Lifestyle Type 5, respondents with **university- or college-degrees** are overrepresented. They often describe to have an **average or below average social status**. With 22.3%, the group has the **smallest share of respondents who live in rural areas** and is clearly below the 31-country average (30.5%). The **age groups 35-44 and 45-54** are overrepresented in this sub-group, as are people who are either **self-employed** or employed for **30h per week or above**. The ratio between men and women is nearly balanced (Table 14).

Table 14 "Situation" of Lifestyle 5 respondents

Situation	Regional representation: Overrepresented in North-Eastern to Southeastern Europe and Turkey
	Representation of age groups: 35-44 overrepresented, 45-54 slightly overrepresented
	Gender ratio: 48.9% men, 51.1% women
	Household size: Overrepresentation of respondents living in households of 3 or more people
	Living environment 22.3% live in rural regions
	Education Overrepresentation of respondents with university- or college-degrees
	Social status Overrepresentation of respondents who describe their status as <i>average</i> or <i>below average</i>
	Employment Overrepresentation of respondents who are <i>self-employed</i> or <i>employed 30h/week and above</i>

With an average overall lifestyle related energy demand of 75 Gigajoule, respondents with Energy Lifestyle 5 have the smallest lifestyle related energy demand of all six assigned groups and by that are far below the European average of 112 Gigajoule. Most characteristic of this group is the fact that it has a **below the 31-country average energy demand in all six areas of life**. The extraordinary low energy impact in the area of **Housing** results from having the **smallest living space per capita**, and an overrepresentation of **flats in blocks with more than 10 dwellings**. This even outweighs the fact that gas and coal are overrepresented heating. The group's below average

energy demand in **Mobility** results from a **comparatively small annual driving distance** and from a **below average number of flight hours**. **Gas powered vehicles** are overrepresented. Respondents who have **not yet tried carsharing, but would be interested** are overrepresented. With regard to cycling, Lifestyle 5 respondents often stated to **bike rarely**, or **sometimes during summer**. In terms of consumption, the group members can be characterised as **extraordinary frugal**. With regard to **Diet**, the group has a large share of respondents who eat **meat very rarely or in some of their meals**. Group members tend to have **Leisure** activities with a **little or very little need for equipment and infrastructure**. Respondents who use **electronics very little or less than most others** for gathering **Information**, are overrepresented in Lifestyle 5 (Figure 22, Table 15).

Table 15 Energy related "Performance" of Lifestyle 5 respondents

Performance	<p>Housing: Living space of up to 20m² per capita overrepresented, mean 27.4m² Flats in blocks with more than 10 dwellings overrepresented Gas and coal as heating fuels overrepresented</p> <p>Mobility: Overrepresentation of respondents driving more than 0-5000km/yr., mean 9203km Overrepresentation of respondents who drive Gas powered vehicles Overrepresentation of respondents flying 0 and <3 hours/yr., mean 3.2 Overrepresentation of respondents who have not tried carsharing yet, but are interested Overrepresentation of respondents who bike <i>rarely</i>, <i>sometimes</i> or <i>during summer</i></p> <p>Consumption Overrepresentation of respondents who describe their fashion preferences as <i>modest</i>, and of those who use fashion for long and also use second hand clothes. Overrepresentation of respondents who prefer a <i>long use</i> of electronics and replace equipment <i>only if it is broken</i>, and of respondents who stated that they <i>do not need most of it</i>.</p> <p>Diet Overrepresentation of respondents who eat meat <i>very rarely</i> or have meat in some of their meals.</p> <p>Leisure Overrepresentation of respondents with leisure activities that require <i>little</i> or <i>very little</i> equipment and infrastructure.</p> <p>Information Overrepresentation of respondents who use electronics <i>very little</i> or <i>less than most others</i>.</p>
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3.3.6. Energy Lifestyle 6 Characteristics

As depicted in Figure 23, Energy Lifestyle 6 is overrepresented in, but not limited to the northern and western parts of Europe.

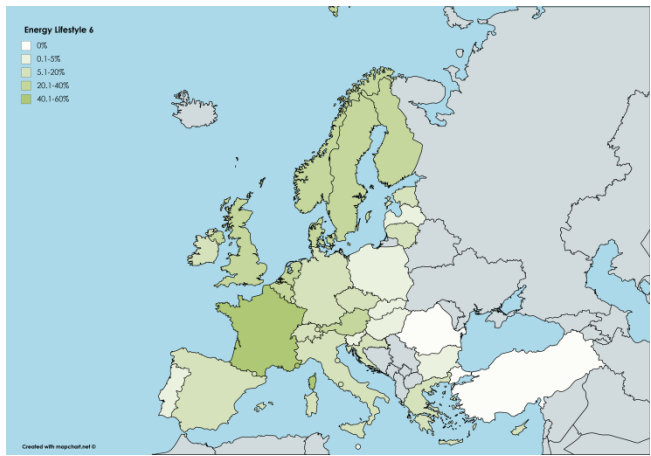


Figure 23 Regional distribution of Energy Lifestyle 6 across Europe

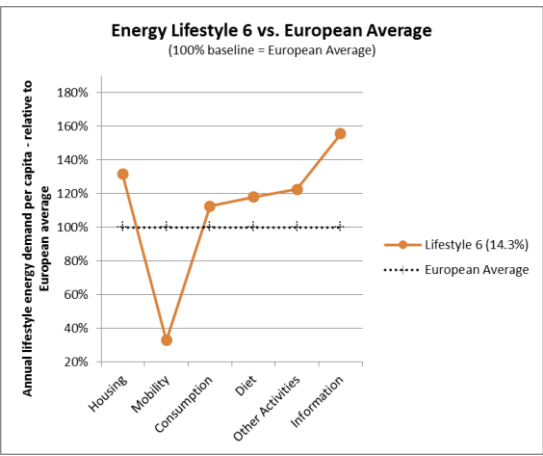


Figure 24 Energy Demand Profile of Energy Lifestyle 6 in relation to the European Average

In the group identified as Lifestyle Type 6, respondents with **elementary** or **secondary school** as highest level of education are overrepresented. They often describe to have a **below average social status** or to even be **worst off** with regard to their status. With 29.8%, the group has an **about average share of respondents who live in rural areas** (31-country average = 30.5%). The **age groups 18-34** and **45-54** are overrepresented in this sub-group, as are people who are either **full time students**, **unemployed**, or **engaged in unpaid housework**. Women are slightly overrepresented in the group (Table 16).

Table 16 "Situation" of Lifestyle 6 respondents

Situation	Regional representation: Overrepresented in Northern- and Western-Europe
	Representation of age groups: 55+ overrepresented, 18-34 overrepresented
	Gender ratio: 47.2% men, 52.8% women
	Household size: Overrepresentation of respondents living in households of 1 or 2 people
	Living environment 29.8% live in rural regions
	Education Overrepresentation of respondents with elementary or secondary school as highest education
	Social status Overrepresentation of respondents who describe their status as <i>below average</i> or <i>worst off</i>
	Employment Overrepresentation of <i>full time students</i> , <i>unemployed</i> and people engaged in <i>unpaid housework</i>

With an average overall lifestyle related energy demand of 101 Gigajoule, respondents with Energy Lifestyle 6 have a lifestyle related energy demand which is slightly below the European average of 112 Gigajoule. Most characteristic of this group is the fact that it has **the smallest energy demand for Mobility of all groups, while it has an above average energy demand in all other areas of life**. The energy impact in the area of **Housing** results from having slightly **above average living space per capita**, and an overrepresentation of **flats in blocks with up to 10 dwellings**. The group's extraordinary low average energy demand in **Mobility** results from **having the smallest annual driving distance**, and from having the **smallest number of annual flight hours**. **Petrol powered vehicles** are overrepresented. Respondents who are **not interested in trying carsharing** and respondents who **bike during the whole year or during winter** are overrepresented. In terms of **Consumption**, Lifestyle 6 members have an **above average primary energy demand**, even though respondents with long-use fashion preferences are overrepresented. With regard to **Diet**, the group has a large share of respondents who have **meat in most of their meals**. Group members tend to have **Leisure** activities with a **moderate need for equipment and infrastructure**. Respondents who use **electronics quite intensively or very intensively** are overrepresented in Lifestyle 6 (Figure 24, Table 17).

Table 17 Energy related "Performance" of Lifestyle 6 respondents

Performance	<p>Housing: Living space between 30.1 and 50m² per capita overrepresented, mean 45.4m² Flats in blocks up to 10 dwellings and semi-detached/terraced homes overrepresented Geothermal heat pumps overrepresented</p> <p>Mobility: Overrepresentation of respondents driving more than 0-5000km/yr., mean 4281km Overrepresentation of respondents who drive Petrol vehicles. Overrepresentation of respondents flying 0 hours/year, mean 1.519 Overrepresentation of respondents who are not interested in trying carsharing Overrepresentation of respondents who bike <i>during the whole year or during winter</i></p> <p>Consumption Overrepresentation of respondents who use fashion for long and also use second hand clothes. Indifferent with respect to preferences in purchasing electronics.</p> <p>Diet Overrepresentation of respondents who have meat in <i>most</i> of their meals.</p> <p>Leisure Overrepresentation of respondents with leisure activities that require a <i>moderate</i> amount of equipment and infrastructure.</p> <p>Information Overrepresentation of respondents who use electronics <i>quite intensively or very intensively</i>.</p>
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3.3.7. Driving Factors for Energy Lifestyles across Europe

In the following section, influencing parameters that can be considered "driving factors" behind energy lifestyles in Europe on a statistically significant basis are determined. For this purpose, "Situation", "Mentality", and "Context" variables (Figure 2) (as well as indices and scales computed from two or more variables, which was considered useful in some cases) were used as explanatory variables for "Performance" based lifestyle group assignment. For this purpose, logistic regression models were used. This enables a systematic approach to the question of which (potentially changeable) external and internal variables stand behind different energy relevant behavioural patterns. This more holistic understanding of lifestyle specific behavioural patterns and their causes is intended to increase the accuracy of target group specific policy design.

"Situation" and "Context" factors

The coefficients and odds-ratios for the "Situation" and "Context" variables shown in Table 18 widely represent the above described sociodemographic characteristics of Lifestyles 1-6, which is why they are not discussed in detail. Thus, the main focus in this section will be on "Mentality" related, psychological factors.

"Mentality" factors

In addition to the above mentioned "Situation" and "Context" factors, "Mentality" related variables offer specific insight into the role of psychological variables and how they affect the chance of having behavioural patterns or energy-impact patterns consistent with one of the six Energy Lifestyles. At first glance, it is noticeable that none of the psychological predictor variables examined has a significant effect with respect to the assignment to all six lifestyles, whereas this is the case for some "Situation" variables and for the majority of "Context" variables. In the following the roles of "Mentality" related variables with significant effects on group assignment are shortly discussed.

Political orientation

Right political orientation increases the chance of having behaviour and related impact patterns according to **Lifestyle 4**, and decreases the chance of having **Lifestyle 6** patterns. The most obvious difference between these two groups in terms of energy demand is their **Mobility** related behaviour, which results in Lifestyle 4 having the highest mobility (and overall) energy demand and Lifestyle 6 having the lowest mobility related energy demand and an average overall energy demand.

Agreement with statement that renewable energy sources are beneficial for the environment

An **increased agreement with the statement that renewables benefit the environment** is associated with an **increased chance of having** behaviour and related impact patterns according to **Lifestyle 1 or Lifestyle 2**, and with a **decreased chance** of having Lifestyle 3 patterns. While Lifestyle 1 and Lifestyle 2 have below average overall energy demands and below average energy demands in most areas of life, Lifestyle 3 has an above average overall energy demand and an above average energy demand in most areas of life.

Agreement with statement that renewable energy sources create new jobs

An **increased agreement with the statement that renewables benefit the environment** is associated with an **increased chance of having** behaviour and related impact patterns according to **Lifestyle 5**, which has the smallest overall energy impact and an energy demand which is below the 31-country average in all areas of life.

Believe in climate change

A stronger **believe in climate change** is associated with an **increased chance of having** behaviour and related impact patterns according to **Lifestyle 6**, which has the smallest **Mobility** related energy demand.

Self-efficacy

Higher **self-efficacy** is associated with a **decreased chance of having** behaviour and related impact patterns according to **Lifestyle 6**.

Personal obligation and environmental identity

An increase in **personal obligation to act in an energy-saving manner** is associated with an **increased chance** of having behaviour and related impact patterns according to **Lifestyle 1** or **Lifestyle 5**, and with a **decreased chance** of having **Lifestyle 4** typical patterns.

An increase in **environmental identity** is associated with an **increasing chance** of having behaviour and related impact patterns according to **Lifestyle 2** or **Lifestyle 5**, and with a **decreased chance** of having **Lifestyle 1** or **Lifestyle 4** typical patterns.

It is also noticeable that “personal obligation” and “environmental identity” have consistent significant effects only in the cases of the most energy intensive and the most energy saving lifestyles, namely Lifestyle 4 and Lifestyle 5.

Support for individually costly policy interventions

An increased **support for costly policy interventions** is associated with an **increased chance** of having behaviour and related impact patterns according to **Lifestyle 3**, and with a **decreased chance** of having **Lifestyle 2** or **Lifestyle 4** typical patterns.

Table 18 Six binary logistic regression models for the likelihood of belonging to the respective energy lifestyle group vs. belonging to the rest of the sample (only significant effects $p \leq 0.05$ are shown)

	Lifestyle 1		Lifestyle 2		Lifestyle 3		Lifestyle 4		Lifestyle 5		Lifestyle 6	
	<i>pseudo R²</i>		<i>pseudo R²</i>		<i>pseudo R²</i>		<i>pseudo R²</i>		<i>pseudo R²</i>		<i>Pseudo R²</i>	
	.318		.252		.196		.193		.381		.212	
Situation	<i>B</i>	<i>Exp(B)</i>	<i>B</i>	<i>Exp(B)</i>	<i>B</i>	<i>Exp(B)</i>	<i>B</i>	<i>Exp(B)</i>	<i>B</i>	<i>Exp(B)</i>	<i>B</i>	<i>Exp(B)</i>
Age category			.040	1.040			-.137	.872	.080	1.083	-.101	.904
Female	.233	1.262	.186	1.204	-.204	.815	-.399	.671	.095	1.100	.113	1.120
Rural environment	-.207	.813	.332	1.394	.089	1.094	.197	1.218	-.262	.769	-.253	.777
Household Size	.280	1.323	-.224	.800			-.064	.938	.190	1.209	-.126	.881
Children <14 present			-.246	.782					.283	1.327	-.172	.842
Higher Education	.121	1.129			-.263	.769	.308	1.361	.221	1.248	-.285	.752
Subj. Social Status	.129	1.138	-.201	.818	.153	1.165	.434	1.543	-.236	.789	-.289	.749
Mentality	<i>B</i>	<i>Exp(B)</i>	<i>B</i>	<i>Exp(B)</i>	<i>B</i>	<i>Exp(B)</i>	<i>B</i>	<i>Exp(B)</i>	<i>B</i>	<i>Exp(B)</i>	<i>B</i>	<i>Exp(B)</i>
Political Orientation							.139	1.149			-.098	.907
Accept: Renewables good for environment	.110	1.116	.060	1.061	-.091	.913						
Accept: Renewables create new jobs									.058	1.060		
Believe in Climate Change											.090	1.094
Normative Pressure												
Self-Efficacy											-.095	.909
Personal Obligation	.136	1.145					-.167	.846	.103	1.108		
Environmental Identity	-.130	.879	.096	1.101			-.081	.923	.102	1.108		
Intention to support energy transition												
Support for costly policy interventions			-.063	.939	.118	1.125	-.065	.937				
Context	<i>B</i>	<i>Exp(B)</i>	<i>B</i>	<i>Exp(B)</i>	<i>B</i>	<i>Exp(B)</i>	<i>B</i>	<i>Exp(B)</i>	<i>B</i>	<i>Exp(B)</i>	<i>B</i>	<i>Exp(B)</i>
Southwestern Europe	3.310	27.376	-1.449	.235	-2.311	.099	-1.628	.196			-1.663	.190
Central Europe	-.704	.495	1.789	5.981	.692	1.997	-1.192	.304	1.663	5.274	-1.080	.340
Southern Europe	.937	2.553	1.665	5.285	-.628	.533	-.920	.398	2.053	7.793	-1.169	.311
Southeastern	.429	1.535	2.297	9.946	-3.276	.038	-2.735	.065	3.509	33.403	-2.747	.064
Northeastern/Eastern Europe	-.205	.814	2.767	15.918	-1.136	.321	-1.913	.148	3.014	20.374	-2.123	.120
Turkey	-.335	.715	.829	2.290	-4.478	.011	-5.469	.004	4.892	133.232		
Northern Europe	-1.623	.197			.227	1.255	.262	1.300	-.609	.544		

Comparing the role of “Situation”, “Mentality” and “Context” factors

To compare the explanatory power of the driving factors from the categories “Situation”, “Mentality” and “Context”, they were entered block-wise into the respective logistic regression models. This allows a *rough* estimation of the role of these factors regarding the emergence of lifestyle-specific behavioural and impact patterns. Since the “Context” component was operationalised in the form of variables representing eight different regions, (as used in the chapter above), the Context-component includes cultural, political, legal, economic and climatic parameters that are characteristic for the respective country bundles. As shown in Figure 25, the explanatory power generated in the final models (which include all three categories “Situation”, “Mentality”, and “Context”) is dominated (between 53 and 85%) by the role of the “Context” component in the case of all six Energy Lifestyles.

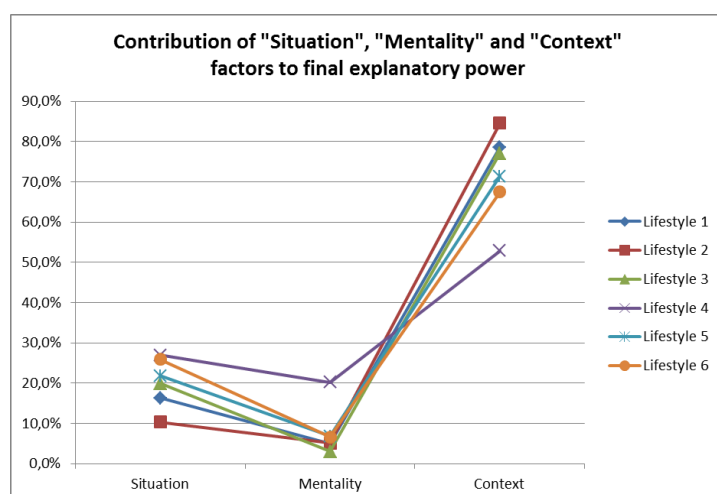


Figure 25 Explanatory Power of “Situation”, “Mentality” and “Context” for six European Energy Lifestyles

Even if a detailed comparison of the composition of the explanatory power of the three “driving factors” categories is not entirely possible for methodological reasons⁸, an apparently special pattern is noticeable in the case of Lifestyle 4. When **Lifestyle 4** is compared to other Lifestyle groups, **psychological parameters (“Mentality”)** seem to play a more important role, while **geographical or national circumstances seem to be slightly less relevant for the development of Lifestyle 4** than this is the case with the development of the behavioural and impact related patterns of other groups. This is especially exciting since Lifestyle 4 is the group with the highest overall energy demand and the highest energy demand in the particularly resource-intensive categories housing and mobility. For this impact-intensive lifestyle, contextual conditions play a lesser role, which appears plausible in particular with regard to the non-local character of mobility related behaviour. The fact that the role of the “Mentality” block is relatively more relevant for Lifestyle 4 than for the other lifestyles reflects the fact that four such factors are significantly associated with group assignment here, whereas other lifestyles are only associated with 2 to 3 each.

The overall picture shows that the role of context factors is relatively large. However, the fact that certain lifestyles in terms of behaviour-related impact patterns exist in contextually radically different regions (although in smaller numbers) shows the relevance of identifying lifestyles on the basis of such patterns instead of proxy variables.

⁸ Using binary logistic “group versus rest” models was chosen over multinomial logistic regression due to the fact that choosing a certain Lifestyle group as reference category would have considerably complicated the interpretation of results. Therefore the reference category is not constant across the six models.

4. CONCLUSIONS

4.1. Experiences with the impact based energy lifestyle approach in empirical practice

While the basic idea of moving impact-relevant behaviour into the centre of research seems logical and simple, its operationalisation in the form of a survey instrument (questionnaire), and the quantitative exploitation (Lifecycle Assessment on the basis of survey-responses, and statistical analysis) proved to be considerably challenging. In concrete terms, the collection of survey data in ECHOES was characterised by the fact that a single questionnaire had to be used in all 31 countries. This required a trade-off in formulating the energy-relevant behavioural variables and response categories that would take the specificities of individual countries sufficiently into account without generating a number of variables that do not generate meaningful data in most countries. For example, ferry transport plays some role in a few countries, but mostly not. Conversely, heating of buildings plays an important role in many countries, but very little in some others. The processing of the survey data in the sense of estimating the primary energy demand of individually consumed products and services by means of lifecycle assessment required the use of a broad spectrum of secondary data (chapter 2.2, Table 2) and, in some cases, further intensive cooperation between the social sciences and the systems sciences in order to achieve the best possible decision if several alternatives were considered (e.g. in the case of weighting factors for consumption intensity).

With regard to the generation of in-depth knowledge about the **"high" and "low" impact groups** in the various countries, it has been shown that the number of universal driving factors is limited. This finding follows the guiding hypothesis that a focus on the "average citizen" strongly limits the potential knowledge gain and that the identification of relevant subgroups promises more meaningful insights. However, this **heterogeneity of driving factors** in different countries and subgroups also goes hand in hand with a constraint that is reflected in the discussion of the results: The number of potentially interesting empirical findings that can be achieved by the impact based energy lifestyle approach is immense, which makes the **identification of "the most relevant" results** a challenge. The findings deliver answers, but also a large variety of continuative research questions with regard to relationships between driving factors and behaviour under different framework conditions, between certain behaviours and their lifestyle energy impact, between life-decisions and causally linked behaviours, between different behavioural domains (keywords: rebound effect and spillover effect) etc. Although such in-depth questions can partly be approached in focus group discussions, these possibilities are restricted by limitations in group size and representativity. Therefore, the formulation of more detail specific research questions with regard to "high" or "low" impact groups will be essential in future research.

The **impact-based identification of Lifestyle groups 1-6** in chapter 3.3 showed that it is also worth taking a more detailed look beyond the distinction between "high impact" and "low impact" groups and identifying groups on the basis of their energy demand patterns which result from individuals' behaviour in different areas of life. As stated above, the relevance of impact based group identification became apparent especially due to the fact that certain lifestyles in terms of behaviour-related impact patterns exist in contextually radically different regions (although in smaller numbers). This shows the relevance of identifying lifestyles on the basis of such patterns instead of proxy variables. During the analysis of these empirically existing Lifestyle groups it became evident that they do not only differ in their behaviour and impact patterns but are also affected by driving factors in specific ways. Thus, ECHOES Task 5.2 made it possible to establish a picture of the large energy relevant societal groups in Europe by describing how they typically live and behave, and by quantitatively assessing the factors behind their specific behavioural patterns. However, similar to the focus on "high impact" and "low impact" groups, this more content-oriented group identification also showed that the number of created insights makes the selection of "the most relevant" findings a challenge. So, which of the empirically noticeable strands should be further pursued? This decision can be best made in view of concrete questions. This means that there is need for further research e.g. on how a certain lifestyle group behaves in a certain behavioural domain and how their behaviour can be influenced towards more sustainability, taking their lifestyle specific behavioural patterns across different areas of life and associated opportunities and restrictions into account. The results shown in this deliverable thus primarily give an overview of the energy lifestyle landscape in Europe and support the hypothesis that in terms of energy behaviour **"the average**

citizen does not exist, but typical groups do". In total, it can be concluded that the cross-national conduct of the newly developed approach of impact-based lifestyle group identification has produced encouraging results. This applies in particular to the challenge of identifying lifestyle groups that show considerable differences in their energy-related behaviour patterns; a requirement for which in the past less plausible results have been achieved by applying "Mentality" based lifestyle approaches (Bohunovsky et al., 2011; Hierzinger et al., 2011). In any case, the results obtained with impact based lifestyle research during ECHOES Tasks 5.1 and 5.2 emphasise the *relevance and feasibility* of interdisciplinary cooperation beyond the boundaries of social science and humanities (SSH), especially in energy and climate relevant research.

With regard to the policy-applicability of Energy Lifestyle related findings, two levels must be distinguished:

- 1) On the **descriptive level**, the approach generates a **bottom-up picture of the distribution and composition of primary energy use within a society**. By addressing the question of distribution, starting points arise in particular when it comes to the design of **tax models** that take different target groups and fairness aspects into account. In addition, the descriptive level offers cross-sector **feedback on the effectiveness of policy interventions** in different social groups. This cross-sectoral image on energy behaviour also makes it possible to **reveal undesirable consequences** such as indirect **rebound effects** (i.e. energy savings in one area that are overcompensated by increased demand in another area) early.
- 2) On the **analytical level**, the approach provides information about which factors or constellations of factors and framework conditions lead to certain behavioural patterns and related energy impacts. This insight on the background of different patterns of energy behaviour and energy impacts, respectively, is particularly relevant if the effectiveness of different options is to be **modelled in advance of policy decisions**.

4.2. Policy relevance and recommendations

With regard to policy-relevant outcomes of ECHOES Tasks 5.1 and 5.2, the analyses on the driving factors for lifestyle-specific energy behaviour and impacts have produced two major insights:

Firstly, the analysis of **"high" and "low" impact** subgroups showed that focusing on subgroups that differ in terms of their overall lifestyle related energy demand provides a valuable first step beyond the aggregate level view on the "average citizen". At the lower end of the energy intensity spectrum, this perspective shows how a lifestyle may look alike in a given "context" to achieve an **exceptionally low energy demand**. This view on **"low impact" groups that already exist today** removes the utopian "taste" from scenarios envisaging a wider spread of more sustainable lifestyles. At the upper end of the spectrum it becomes clear which behaviours lead to a **particularly high energy impact on lifestyle level** and how such behavioural patterns are integrated into the overall lifestyle of the respective group.

Secondly, the analysis of **Energy Lifestyle groups with distinct behavioural patterns** (reflected in their energy impacts across six areas of life) proved that **"the average citizen" does not exist in a relevant number** on European level. Thus, the approach of impact-based lifestyle research facilitates the development of a stronger **target group orientation** in the currently sector-focused energy related **policy-making**. This integrated perspective across different areas of life makes it possible to **address a larger number of citizens at their current state in terms of energy use**.

4.2.1. Policy recommendations

With regard to formulating workable **policy recommendations**, both **"high" and "low" impact subgroups**, and **the six European Energy Lifestyles** identified on the basis of **energy impact patterns**, provide new starting

points. On the basis of the empirical results achieved in the course of ECHOES Tasks 5.1 and 5.2, the following recommendations can be made:

- 1) It appears worthwhile to **emphasise the role** of those people who, under given conditions, already have **a particularly low lifestyle-specific (energy) impact**. By providing information about **how existing low-impact lifestyles look like**, and by emphasising that the **low-impact group already represents a significant part of the population**, sustainable lifestyles within a society can be characterised in a more tangible way, which holds the chance that new role models emerge.
- 2) The view on the 10% of the population with the highest energy impact **at a first glance indicated a problem in the mobility sector**. However, policy design based on a **sector-centric approach would be too short-sighted** in this respect, which again underlines the importance of a **holistic perspective on energy relevant behaviour**: With regard to high-impact groups, the question as to which lifestyle-specific patterns result in an extremely high energy demand for mobility appears to be crucial. This is because **mobility behaviour, in particular, is shaped to a good extent by everyday routines external to the sphere of mobility**. For example, the distance between home and work is only to some extent determined by personal choices and a short distance between home and work is not always a primary criterion for the uptake of a new job. Therefore, the need to commute should rather be seen as a **side effect of personal lifestyle decisions** in other domains than mobility, for example the wish to live in a single family home in the countryside, or taking up a new rewarding job in a distant city. It is therefore reasonable to promote framework conditions that take interactions between different areas of life into account.
- 3) The analysis of the six identified major Energy Lifestyles across 31 countries particularly demonstrated that not only the differences in energy intensity between different social groups are immense, but also that the composition of energy demand can be very different as a consequence of **Lifestyle specific behavioural patterns**. The fact that these behavioural patterns are **associated with the driving factors "Situation", "Mentality" and "Context" in very different ways** once again underlines the **importance of not assuming the existence of an "average citizen"** in energy policy matters. The chance of generating a **more realistic picture of the way large groups actually live** improves the possibilities for target group-oriented **communication and policy design**. Thus, the distant goal of picking up people exactly where they are at the moment is brought one step closer by a better knowledge of group-specific characteristics and behaviours (as well as equipment usage). However, **more in-depth research is needed for a clearer and more detailed picture**. This includes, among other things, especially the **collection of longitudinal data** of energy relevant behaviour in order to map developments and trends over time and to model and evaluate the effectiveness of policy measures.

Although the analyses in chapters 3.1, 3.2, and 3.3 show (in accordance with existing literature) a certain relationship between social status and energy impact, this statistical relationship does not mean that all individuals with low energy impact have this energy lifestyle due to economic restrictions. Low impact lifestyles do not necessarily reduce economic prosperity. Instead, they may promote a shift towards the consumption of goods and services with a smaller environmental impact. Referring back to the four initial questions raised in Figure 1, **not only the "how much?"** is relevant when it comes to distinguishing "high impact" from "low impact" lifestyles, but above all it is the question **"of what?"**. It is therefore promising for both policy makers and economic decision-makers to take a closer look at energy lifestyles and ask specific research questions in order to identify as early as possible **political and economic potentials** that are compatible with the goals of the **Energy Transition** and the **SET Plan**.

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5. APPENDIX – LIST OF SURVEY VARIABLES USED

Sociodemographic Questions (“Situation”)			
Code	Title	Content/Question	Type of use
Q0	country_s ample		direct
Q1	age	How old are you?	direct
Q2	gender	Please indicate your gender	dummy (female = 1)
Q3	employe nt	Which of the following best describes you?	direct
Q4	rural	Which of the following best describes where you live?	dummy (rural = 1)
Q8	number_r esidents	How many people currently live in your household, including yourself?	direct
Q9	children	How many children do you have?	direct
Q10	under_14	How many of your children are under the age of 14?	dummy (present = 1)
Q11	education	Which of the following is your highest level of education?	direct <i>and</i> dummy (higher educ. = 1)
Q12	social_stat us	Where would you place yourself on this ladder?	direct
Q13	economic_ outlook	How would you describe your political outlook with regard to economic issues (e.g. taxes, cooperative vs. protective foreign economic policy, etc.)?	Political orientation = (Q13 + Q14)/2
Q14	social_outl ook	How would you describe your political outlook with regard to social issues (e.g., family, religion, traditional values, etc.)?	
Psychological Questions (“Mentality”)			
Code	Title	Content/Question	Type of use
Q31	ren_envi r	The use of more renewable energy sources will benefit the environment.	direct
Q32	ren_jobs	The use of more renewable energy sources will create new jobs in	direct
Q33	climatec hange	Most scientists say that the world’s temperature has slowly been rising over the past 100 years. Do you think this has been happening?	direct
Q36	personal effort_n orm	Many people in [country] 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.	Normative pressure = (Q36 + Q37 + Q38)/3
Q37	etransi on_nor m	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	other_sa ve_nor m	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).	
Q49	i_etransi tion	As an individual, I can do a lot to support the energy transition.	direct

Q53	obligation_energy	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).	Personal obligation = (Q53 + Q54)/2
Q54	obligation_policy	I feel a personal obligation to support energy policies that support the energy transition.	
Q61	environmental	Acting pro-environmentally is an important part of who I am.	direct
Q63	intention_transition	I intend to use energy in a way that helps bringing the transition to a renewable energy system.	direct
Q64	accept_policy_cost	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).	Policy acceptance = (Q64 + Q66)/2
Q66	accept_policy_job_obs_cost	I would accept energy policies that create new jobs in even when these induce higher costs (e.g., policies that increase the prices of fossil fuels).	
Behaviour & Equipment Use Questions ("Performance")			
Code	Title	Content/Question	
Q75	km_driver	How many km per year do you drive a car as a driver (privately incl. driving to work)?	LCA based estimation of energy demand
Q76	drive_alone	How often do you drive alone in the car? (For private purposes - including trips between your home and working place)	LCA based estimation of energy demand
Q77	people_in_car	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.	LCA based estimation of energy demand
Q78	car_type	What type of propulsion does the private car you most commonly use have?	LCA based estimation of energy demand
Q79	fuel_cons	What is the fuel consumption (litres per 100km) you have with your most commonly used car?	LCA based estimation of energy demand
Q80	distance_e_car	What is the average distance you can drive with a fully charged battery?	LCA based estimation of energy demand
Q81	km_scooter	How many km per year do you ride a motorbike or scooter (privately incl. driving to work)?	LCA based estimation of energy demand
Q82	fuel_scooter	What is the fuel consumption (litres per 100km) of your most commonly used motorbike or scooter? (privately incl. driving to work)	LCA based estimation of energy demand
Q83	trips_passenger	For how many trips per week are you a passenger in a private vehicle?	LCA based estimation of energy demand
Q84	passenger_people	When you are a passenger in a private vehicle, how many people including yourself are usually in the car?	LCA based estimation of energy demand
Q85a	publictrans_bus	Which type(s) of public transportation do you use as a part of your routine mobility? (please choose all that apply)	LCA based estimation of energy demand

Q85b	publictrans_train	Which type(s) of public transportation do you use as a part of your routine mobility? (please choose all that apply)	LCA based estimation of energy demand
Q85c	publictrans_tram	Which type(s) of public transportation do you use as a part of your routine mobility? (please choose all that apply)	LCA based estimation of energy demand
Q85d	publictrans_metro	Which type(s) of public transportation do you use as a part of your routine mobility? (please choose all that apply)	LCA based estimation of energy demand
Q85e	publictrans_none	Which type(s) of public transportation do you use as a part of your routine mobility? (please choose all that apply)	LCA based estimation of energy demand
Q86	bus	time spent	LCA based estimation of energy demand
Q87	train	time spent	LCA based estimation of energy demand
Q88	tram	time spent	LCA based estimation of energy demand
Q89	underground	time spent	LCA based estimation of energy demand
Q90	bike_use	Please choose the answer that best describes your bicycle use.	LCA based estimation of energy demand
Q91	car_sharing	Please choose the response that fits your opinion about carsharing the best.	LCA based estimation of energy demand
Q92	flights_private	About how many hours have you spent on private flights during the last year?	LCA based estimation of energy demand
Q93	flights_business	Did you take any business trips by plane during the past year?	LCA based estimation of energy demand
Q94	dwelling_type	In what type of house do you live?	LCA based estimation of energy demand
Q95	dwelling_size	How much indoor living space does your household have?	LCA based estimation of energy demand
Q96	heating	How is your home primarily heated?	LCA based estimation of energy demand
Q97	heating_fuel	Do you know what your primary heating fuel is?	LCA based estimation of energy demand
Q98	tempsetting	What do you think about your preferred room temperature setting compared to other people you know in your country?	LCA based estimation of energy demand
Q99	aircond	How often do you use air condition at home during the summer?	LCA based estimation of energy demand
Q100	dwelling_age	When was the house in which you live built?	LCA based estimation of energy demand
Q101a	no_renovation	No renovations been made to the respondent's dwelling	LCA based estimation of energy demand
Q101b	wall_renovation	Outside walls of the respondent's dwelling were renovated	LCA based estimation of energy demand
Q101c	roof_renovation	Roof of the respondent's dwelling was renovated	LCA based estimation of energy demand
Q101d	cellar_renovation	Cellar ceiling of the respondent's dwelling was renovated	LCA based estimation of energy demand

Q101e	window_renovation	Windows of the respondent's dwelling was renovated	LCA based estimation of energy demand
Q101f	topfloor_renovation	Top floor ceiling of the respondent's dwelling was renovated	LCA based estimation of energy demand
Q101g	unknown_renovation	Respondent does not know what was renovated	LCA based estimation of energy demand
Q102	disconnect	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.)	LCA based estimation of energy demand
Q103	bulbs	What proportion of your light bulbs at home are energy saving varieties (e.g. LED, compact fluorescent, etc.)?	LCA based estimation of energy demand
Q104	green_provider	Do you purchase your electricity from a provider with a particularly high share of renewable energy production?	LCA based estimation of energy demand
Q105	warm_meals	How many warm meals do you personally eat per week?	LCA based estimation of energy demand
Q106	diet	Please choose the answer that best describes your diet.	LCA based estimation of energy demand
Q107	hot_water	How is hot water provided in your home?	LCA based estimation of energy demand
Q108	bath	Do you have a bathtub?	LCA based estimation of energy demand
Q109	bath_use	What do you choose more often?	LCA based estimation of energy demand
Q110	hobby	Please choose the answer that best fits your hobbies and leisure activities.	LCA based estimation of energy demand
Q111	fashion	Please choose the answer that best describes your preferences in fashion.	LCA based estimation of energy demand
Q112	electro	Please choose the answer that best fits your preferences in purchasing electronics (PC, Notebook, Tablet, Smartphone, TV, Hi-Fi Equipment)	LCA based estimation of energy demand
Q113	electro_use	Please choose the answer that best describes your private usage of electronics. (PC, Notebook, Tablet, Smartphone, TV, Hi-Fi Equipment)	LCA based estimation of energy demand