PSLifestyle

D1.2 Guidelines for application customization

Localizing the PSLifestyle tool for calculating individual carbon footprints

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Executive Summary

The **lifestyles approach** to carbon footprint accounting and climate mitigation aims at shifting people´s lifestyles in line with climate targets. For achieving this goal, citizens´ and stakeholders' engagement is essential to understand the range of needs and possibilities for changing consumption and other aspects of lifestyle.

Besides individual preferences and values, lifestyles are influenced by factors such as **policies, socio-economic conditions, infrastructure,** and others that tend to change across countries. These determine what choices are available, and what people require to be able to reduce their climate impacts.

With this in mind, in 2017 the Finnish Innovation Fund Sitra developed a digital tool to collect individual **carbon footprint** data by providing to citizens a questionnaire (i.e. a test) on their lifestyle and consumption habits. After taking the test the citizens were presented with a series of alternative lifestyle options (or **"smart actions"**) with associated emission reductions. By committing to adopt a series of these actions, they were able to develop **emission reduction pathways** in line with climate targets. Overall, by December 2020, these commitments amounted to a total emissions reduction of over **6000 tonnes of CO_2e**.

Following this first application, **the Horizon 2020 project PSLifestyle**, aims at expanding the user base and potential impact of the tool by adapting it to the context of eight European countries: **Estonia, Finland, Germany, Greece, Italy, Portugal, Slovenia, and Turkey.**

This report presents the methodology and the results of the localization of the tool in these countries. The methodology describes the **collaborative approach** with country partners that was followed for the localization. This is structured as a replicable set of steps that constitutes the blueprint for other localizations. The methodology includes the localization of the test, for example by filtering out not relevant questions, and the localization of the underlying data used for calculating the carbon footprints. The localization of the test also focused on aspects of **inclusiveness**, identifying groups that are, or are at risk of, being marginalized in each country, as well as other barriers to the **accessibility** of the tool.

The results describe the **country-specific versions of the tool** produced, as well as the **main challenges** identified in each country. The challenge areas identified and assessed across countries include complexity and comprehensiveness of the test, data availability, consumption domains of major impacts, and inclusiveness and accessibility.

Overall, the localization produced improved versions of the tool that will reach a broader and more diverse user base than its first application. Their implementation will potentially have a substantial impact in terms of emission reductions in Europe.

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1 Introduction

1.1 Sustainable Lifestyles

Keeping global temperature rise below 1.5°C is essential to mitigate the worst effects of climate change (IPCC, 2018). This requires transitioning towards more sustainable economies with reduced fossil fuel use and adapting to low-carbon consumption options and more sustainable consumption levels (Akenji et al., 2021). For achieving this challenging task, changes in production systems, business models, policy strategies, technologies and infrastructures are needed, together with evidence-based transition pathways that empower individuals for lowering their carbon footprint.

Carbon emissions from household consumption are estimated to account for around 72% of global emissions, including emissions from housing, transport, food, and other goods and services (Hertwich and Peters, 2009). While reducing the carbon footprint of household consumption is essential for addressing the climate crisis, individuals share this responsibility with policymakers, business, and other actors that can enable or constrain adopting any consumption or lifestyle choice. Increasingly, people are willing to act and are demanding changes in production systems, infrastructures, and policies to mitigate the risks of the climate crisis. In a recent survey of the Pew Research Center, over 16,000 adults in 16 advanced economies said that they are willing to make at least some changes to their lives to help reduce the effects of climate change, including between 69% and 93% of respondents in nine European countries (Bell et al., 2021). In another survey requested by the European Commission, over 90% of citizens across the EU said that they have taken a least one everyday life action to tackle climate change (European Commission, 2019). Despite rising levels of awareness and mounting scientific findings showing the need for rapid changes to tackle the climate crisis, there is little evidence that these changes are occurring broadly or quickly enough. Part of this can be attributed to the lack of effective and more ambitious political action and the lack of an enabling environment to change. Another part can be attributed to the absence of practical tools that can be used by citizens to orient them towards more sustainable choices by highlighting not only the climate impacts of consumption, but also the benefits of reducing carbon footprints.

In this vein, a lifestyle approach has been proposed to scale-up individual action for climate change mitigation to the level required for achieving the 1.5°C target (Akenji et al., 2019). This approach aims at presenting a more comprehensive picture of the co-benefits of reducing carbon emissions, including better health, more equal societies, a stronger connection with nature, and improved human as well as ecological wellbeing. Lifestyles, in fact, include much more than just consumption patterns and emissions, and entail non-economic aspects, including spending time with friends, caring for children or elderly parents, exercising, volunteering, or engaging with local communities. All these activities affect our wellbeing as well as our carbon footprint.

Changing our lifestyles can help us achieve the 1.5°C target, but achieving this target is also critical to ensuring quality of life in a more encompassing sense, improving physical and mental health as well as trust and

engagement in communities and quality of social relationships (Coscieme, 2021). The lifestyle approach has been adopted in numerous reports, projects, and initiatives. Amongst these, the EU Horizon 2020 project "EU 1.5 Lifestyles" is mainstreaming 1.5°C lifestyles within and beyond Europe by connecting an analysis of individual lifestyle perspectives with policies and socio-economic structures (EU 1.5 Lifestyles, 2021). The recent report "1.5-Degree Lifestyles: Towards a Fair Consumption Space for All" showed that reductions of emissions from lifestyle between 91-95% in four high-income countries, and between 68-86% in six middle-income countries, are needed for achieving the 1.5°C target by 2050 (Akenji et al., 2021). The report also explores the changes and actions needed for implementing the emission reductions, such as reducing excessive consumption levels, reduce meat consumption, reduce food loss, switch to renewables, reduce flying, and switch from private to public or shared transport modes, to name a few. The 1five project, engaged groups of people from six countries that registered daily actions for reducing their lifestyle carbon footprint (1five.org). Participants implemented the actions over the period of one month, and shared weekly stories on their experiences and challenges.

Since 2016, the Finnish Innovation Fund Sitra is promoting changes towards more sustainable lifestyles by inspiring people to make sustainable choices in their everyday life and by helping organizations, communities, local authorities, and businesses discover viable ways to drive this transition.

1.2 The PSLifestyle project and tool

Aiming to help close the action gap between climate awareness and individual action, as well as to increase citizen engagement through a shift from a narrow focus on consumption to a broader focus on lifestyles, the PSLifestyle project (where PS stands for positive and sustainable) contributes to building a data-driven momentum for sustainable lifestyle change across Europe. The project will empower European citizens to adopt a positive, sustainable, and healthier lifestyles in eight European countries (namely Estonia, Finland, Germany, Greece, Italy, Portugal, Slovenia, and Turkey).

The PSLifestyles project will engage citizens through a digital tool to co-develop and uptake lifestyle solutions to climate change, providing tools for the collection, monitoring and analysis of environmental and socio-economic data on lifestyles. Through a co-creative and participatory approach, the project will foster citizens' active participation and engagement for developing local pathways of emission reductions.

The PSLifestyle tool allows for calculating individual carbon footprints starting from the average national footprint of consumption in one country. This average footprint is then adjusted by summing or subtracting certain amounts (in kg CO2e per person per year) calculated based on the answers provided by the users to the questions included in the tool. The PSLifestyle tool includes 29 to 33 questions related to lifestyle in the domains of housing, transport and tourism, food, and purchases of other goods and services. Each question can be answered by selecting from between 2 and 7 possible answers (i.e. options). Some examples of the questions and options included in the tool are showed in Table 1.

After answering the questions in the tool and receiving their carbon footprint, the users are asked to create a personal sustainable lifestyle plan (PSPlan). A selection of lifestyle options is presented to the users in the form of "Smart Everyday Actions" (Sitra, 2017) based on the answers given in the tool. Each action includes the associated carbon footprint reduction as well as other co-benefits, such as for example health benefits or economic savings. The user will be able to browse through the actions and select the ones most suitable to implement. When selecting the actions, a timeline of emission reductions will automatically be completed, starting from the current carbon footprint of the user. This timeline will show what series of actions the user could undertake for reducing lifestyle emissions in line with the 1.5°C target over time.

Browsing through the actions, the user would also be able to discard unfeasible actions or indicate actions that would need changes beyond the user´s control to be feasible. When discarding one action, the user will be asked to comment on why the action is unfeasible or not relevant, including what changes are needed for this action to become feasible (e.g. for example in terms of policies or infrastructures). The users can then save their PSPlan by creating a user profile and either publish it or save it as a private PSPlan. Some of the "Smart Everyday Actions" included in the tool are showed in Table 2.

Table 1: Examples of questions included in the PSLifestyle tool.

Domain	Questions (examples)	Options (examples)
Housing	- What kind of electricity do you use?	- 1) Electricity from the national grid 2) Self-produced electricity from renewables
	- What is the primary heating method of your home?	- 1) District heating 2) Electricity 3) Natural gas 4) Heat pump 5) I don't know
Transport and tourism	- How many kilometers per week do you typically drive?	- 1) I don't drive 2) Less than 100 km 3) 100 - 400 km 4) More than 400 km
	- How many times a week do you walk or cycle to work or go to school?	- 1) Never 2) one time per week 3) 2 to 3 times per week 4) 4 or more times per week

Food	5) How often do you have beef as part of your meal?	– 1) Never 2) 1 to 3 times per week 3) 4 to 7 times per week 4) several times a day
	6) How often do you throw food away?	– 1) Never 2) Seldom 3) Every week 4) Every day
Other consumption	7) How often do you buy second-hand clothes or refurbished electronics?	– 1) Never 2) Seldom 3) I buy about half of my clothes and electronics second-hand or refurbished 4) I buy most of my clothes and electronics second-hand or refurbished

Table 2: Examples of "Smart Everyday Actions" included in the PSLifestyle tool.

Domain	Smart Everyday Actions (examples)
Housing	1) Start using a heat pump 2) Install water meters and monitor water consumption 3) Change to LED lamps
Transport and tourism	4) Cycle or walk to work 5) Use rental shared cars for occasional needs 6) Give up flying
Food	7) Spend a year as a vegetarian 8) Buy discount foods that are close to the best-before date 9) Choose local food at stores and marketplaces
Other consumption	10) Only buy recycled products 11) Borrow books instead of buying them 12) Repair products

1.2 Why localizing the PSLifestyle tool

The PSLifestyles tool is based on an existing tool that was developed by Sitra. By December 2020, the tool was used by almost 2.000 Finns that committed to over 40.000 sustainable lifestyle actions, with an aggregate emission reduction potential of over 6150 tonnes of CO2e (Prime Minister´s Office of Finland, 2021). To further extend the potential impact of the tool, PSLifestyle aims to engage with citizens in eight European countries, and reach a total of four million European citizens, by producing localized versions of the PSLifestyle tool.

According to what observed for the case of Finland, the implementation of these localized PSLifestyle tool in the eight European countries could lead to save over 570.000 tonnes CO2e to be emitted annually.

A localization of the PSLifestyle tool is necessary for ensuring engagement and producing meaningful results, as consumption behavior and other elements of lifestyle tend to substantially differ across countries and cultures. The specificity of lifestyles to different contexts is exemplified by one of the definitions of sustainable lifestyle, that is "a cluster of habits and patterns of behavior embedded in a society and facilitated by institutions, norms and infrastructures that frame individual choice, in order to minimize the use of natural resources and generation of waste, while supporting fairness and prosperity for all" (Akenji and Chen, 2016). Accordingly, not only different lifestyle options resonate with different social and cultural norms, but also differences in institutional settings and infrastructures make some lifestyle options applicable in some countries and contexts and not in others.

As exemplified by the Attitude-Facilitators-Infrastructure (A-F-I) Framework (Figure 1), the individual choices that characterize the carbon footprint of lifestyles depend on a series of factors, many of which change across countries. Attitudes reflect intention, such as pro-sustainability behaviour or lack thereof; facilitators are enablers, which translate intention into action; infrastructure shapes behavioural patterns or lock-ins. For example, our choices in terms of food, housing, transport and/or general consumption may depend on what options are available, accessible, and affordable and may be influenced by what people around us think and what is accepted or not in our society. In Europe, for example, railway density varies substantially, and passenger transport by train is not a suitable option in some countries (Fig. 2). Furthermore, population density and distribution also influence the suitability of transport by train, which tends to become less suitable in rural areas with low population densities or decreasing population (Börjesson et al., 2020).

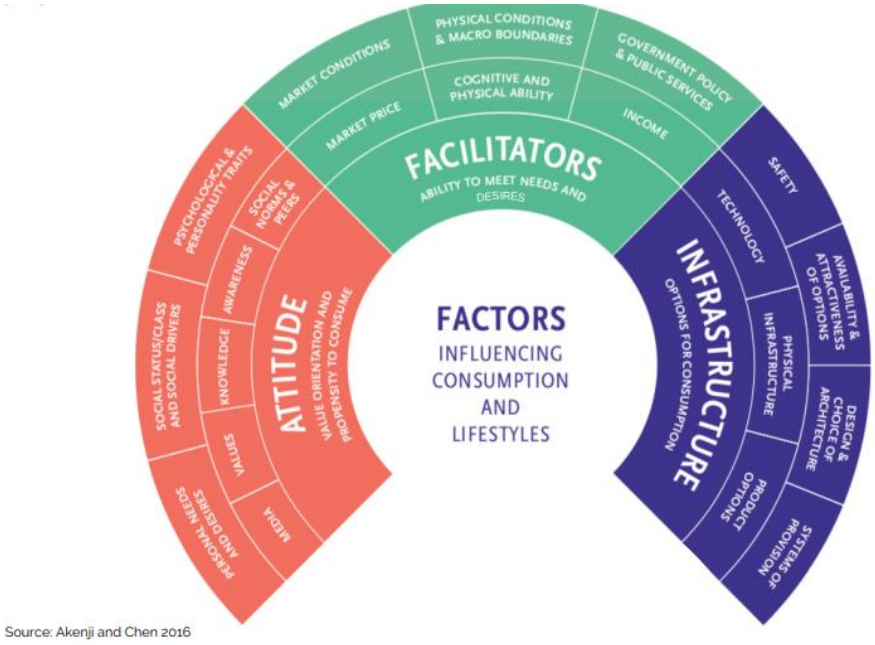

Figure 1. The Attitude-Facilitators-Infrastructure framework illustrates some of the factors influencing sustainable lifestyles that can change across countries, highlighting the need for the localization of the PSLifestyle tool (Akenji and Chen, 2016; p. 23).

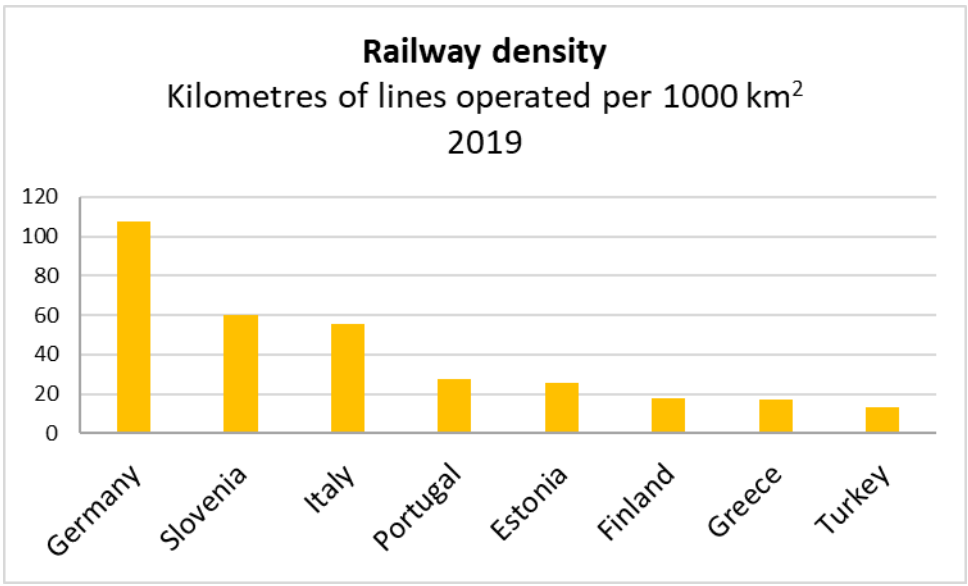

Figure 2. Railway density in selected EU countries (UNECE, 2019).

People's needs also change across countries, depending among others on environmental factors, such as the weather. For example, there is a reduced need for house heating in warmer countries, and in general the need for heating changes considerably across Europe, as exemplified by the European Heating Index (Fig. 3).

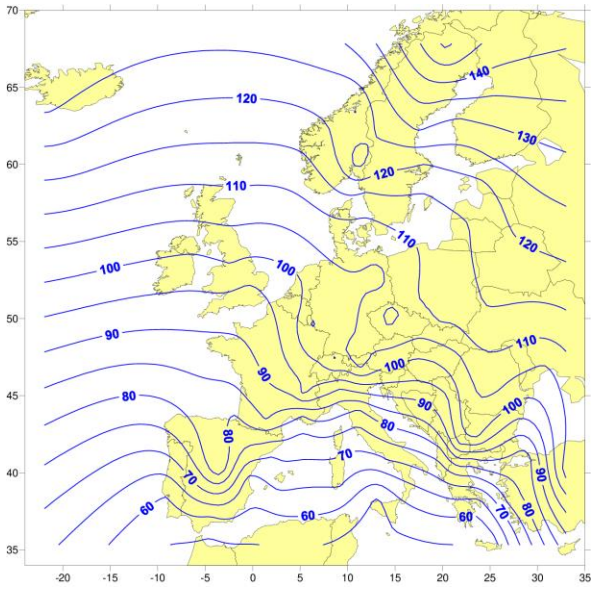

Figure 3. The new European Heating Index (EHI) in a contour map computed from information for 80 urban locations in Europe. Values of the EHI are normalized, with 100 equals to the average European condition. The space heating demand tends to be proportional to this index (Werner, 2006).

As the PSLifestyle tool was originally developed by Sitra to be used in Finland, the questions and options in the tool are tailored to a specific set of users and a specific context. Some examples of questions specifically relevant for Finland are presented in Table 3. These, and other questions as well as options, would need to be adapted by engaging with local partners and citizens.

The aim of this report is to describe the localization process of the PSLifestyle tool, showing the results of this localization for the eight countries considered in PSLifestyle. The report would allow to replicate the localization process for other countries and specific contexts by describing step-by-step what the localization implies and how it can be carried out.

While it is impossible to reflect in the tool all the existing factors of influence to lifestyles, this report highlights essential points to consider and provides indications on possible data sources for localizing the tool across Europe.

Table 3: Examples of PSLifestyle questions and options that require localization outside Finland.

Question	Context
Where in Finland do you live?	On average, heating energy use is 18% higher in Central Finland, and 45% higher in Northern Finland, compared to the South.

How many return trips have you made by ferry in the past 12 months?	Ferries are widely used in Finland including for travelling to neighboring countries.
Do you have a summer cottage?	Modestly equipped summer or year-round cottages are relatively common second homes in Finland. In a country of 5,5 million people there are 0,5 million cottages, and most are privately owned.

2 Methods

2.1 Localization of questions and options

The localization of the PSLifestyle tool was carried out by engaging with organizations in eight European countries with the aim of maintaining an informed local perspective and provide an effective localization (Table 4). It followed a two-steps approach:

- Step 1: localization of questions and options.
- Step 2: localization of data.

Step 1 aims at localizing the questions and options provided to the users in the original version of the tool developed by Sitra in 2017. This step includes:

i. excluding questions and options that are not relevant for the country considered,
ii. adding questions and options of high relevance,
iii. adapting the framing and wording of questions based on the most used terms in different countries,
iv. adapting the questions and options considering what kind of information the users would be able to easily provide and,
v. translating the questions into local languages (plus French, Russian, Spanish, and Swedish).

Furthermore, Step 1 aims at identifying challenges to overcome for ensuring that the tool is inclusive and accessible to groups that are, or are at risk of, being marginalized in the considered context. Based on the results from existing footprint calculators and databases, Step 1 also aims at identifying carbon footprint hotspots for contributing to compile a list of challenges for implementing PSLifestyle in different countries.

Table 4: List of countries and local organizations included in the first localization of the PS Lifestyles tool.

Country	Local organization
Estonia	Let´s do it Foundation (LDIF), Rohetiiger, Green Tiger Foundation (GTF)
Finland	The Finnish Innovation Fund (Sitra)
Germany	Collaborating Centre on Sustainable Consumption and Production (CSCP)
Greece	Athena Research and Innovation Center (Athena RIC) Enosi katanaloton poiotita tis zois (EKPIZO)
Italy	green Apes (GAPES) Fondazione Sviluppo Sostenibile (SUSDEF)
Portugal	DECO-Associação Portuguesa para a Defesa do Consumidor (DECO)
Slovenia	City of Ljubljana (MoL) Circular Change (CCICE)
Turkey	Zeytince Ekolojik Yasamı Destekleme Dernegi (ZEYDD)

Step 1 involved a first round of revision, by means of an Excel spreadsheet, of the questions and options that compose the PSLifestyle tool (please refer to Table 1 for examples, and to Annex 1 for the full list of questions and answers). The Excel spreadsheet was divided into three sections: Section 1 “Test questions”, Section 2 “Other Carbon Footprint calculators”, and Section 3 “Inclusiveness”.

Section 1 presented the original set of questions and options included in the original version of the tool. For each question, a guiding comment was provided for focusing the attention on aspects relevant to the localization of the test. For example, with regards to the question “What kind of electricity do you use (in your house)?”, the following comment was provided “Please reflect if this question is relevant in your country. Do people have

opportunity to choose their electricity service provider?". This question could indeed not be relevant for adopting sustainable lifestyle options in some countries if the citizens are left with no choice over what kind of electricity to use. If not relevant, the question could be modified or even excluded from the questions of the tool. In general, Section 1 is focused on collecting feedback from local organizations on the relevance of question and options in their respective contexts, offering a space for suggesting changes in the questions and/or options, as well as suggesting any additional question to be added.

Section 2 of the spreadsheet was created for local organizations to list existing carbon footprint calculators and databases used in their country and that could serve as a model or as a source of information for the localization of the tool. Existing calculators and databases can allow for a screening analysis of the consumption domains responsible for a larger share of emissions in different countries. This can orient the localization of the PSLifestyle tool, for example towards considering additional questions on consumption domains of high impact. Existing cross-country carbon footprint databases can be used if a bottom-up approach for calculating average carbon footprint is unfeasible, due to missing data, or as a reference figure to be compared with the average carbon footprint calculated in the tool. One example of cross-country footprint database is the Food Carbon Footprint Index (Textbox A).

Section 3 of the spreadsheet was created for local organizations to highlight any foreseen issue of accessibility to the use of the tool in their respective contexts. The feedback gathered in this section included elements related to specific age groups, minority groups, levels of digital literacy, and climate awareness, that differ between countries.

The spreadsheet was made available to the local organizations that were asked to provide their feedback for each section. After this, a second round of bilateral meetings with local organizations was held for assessing the edits suggested and discussing any further relevant point. The main output of Step 1 was a list of questions and options tailored to the considered country, as well as a first outline of some of the main challenges to overcome for implementing PSLifestyle in the countries.

Textbox A: The Food Carbon Footprint Index.

The food carbon footprint index is an aggregated index that considers the quantity and the CO2 emitted per capita for 11 food types supplied for consumption in a country. Starting from that, the index is then built as the difference between the total CO2 produced by the amount of animal products eaten by a person in one country versus the total of non-animal products. The result is a balance that serves as an indicator for the carbon-footprint saving potential per person per year of switching from an animal to a non-animal diet in different countries. In the context of sustainable lifestyles, this index provides useful information on the potential impact of low-carbon food choices in different countries. This could guide a different level of focus on dietary choices when localizing the PSLifestyle tool and/or defining the list of actions to be proposed to the users. The food carbon footprint index is available for 130 countries from https://www.nu3.de. The index varies substantially across European countries, for example from 775 kg CO2/person/year in Estonia and Turkey to 1410 kgCO2/person/year in Finland. This highlights the higher reduction potential from reducing animal-product consumption in Finland, as compared to Estonia or Turkey.

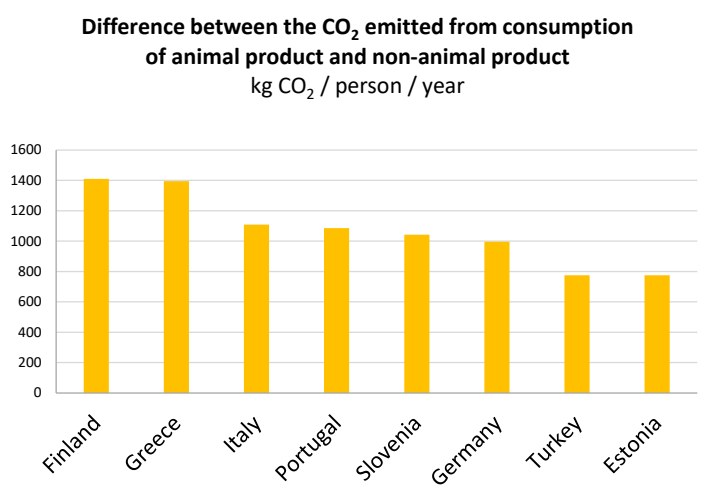

Figure A1. Food carbon footprint index for the eight European countries of PSLifestyle. Lower values indicate that a larger proportion of the population feeds on non-animal products which lower carbon emissions. Data are from the Food Carbon Footprint Index 2018, available from: https://www.nu3.de/blogs/nutrition/food-carbon-footprint-index-2018 (accessed 25.1.2022).

2.2 Localization of data

Step 2 of the localization of PSLifestyle aimed at identifying and collecting the data needed for the calculation of the lifestyle carbon footprint in the considered country. Data to be localized was identified based on the set of localized questions and options produced after Step 1. The localization of data for the PSLifestyle tool regarded three groups of data:

i. consumption amounts: including quantities consumed or used, for example of meat or electricity, in one country,
ii. carbon intensities: the greenhouse gas emissions, in terms of CO2e, associated with different consumption categories,
iii. other data: such as for example the energy mix of the country considered, the share of transport demand over total demand for different transport modes, as well as any other data needed.

As a first approximation, the localization of consumption data was done by using available data sources from publicly available international databases, such Eurostat (https://ec.europa.eu/eurostat/data/database), or OECD data (https://data.oecd.org/). This allowed for identifying different levels of missing data, which further informed the list of challenges for implementing PSLifestyle across countries. Whenever available, more accurate data from national statistical offices or other sources was used. National statistics are preferable if high-quality data standards can be ensured, and quality checks documented. The methodology followed for the localization of the consumption amount data of the PSLifestyle tool is described in more detail below, including cross-country data sources:

Mobility: The localization of mobility data concerned data on the volume and share of transportation demand for different transportation modes in the considered country. In particular, the data on volume and share of transportation demand needed for the localization of the mobility footprint is shown in Table 5, including possible data sources from international publicly available databases. More accurate or recent data from, for example, national statistical offices, were used when available.

Table 5: Indicators and data sources for the calculation and localization of the carbon footprint of mobility.

Indicator	Unit	Source
Total inland passenger transport demand	Passenger-kilometers,	OECD Statistics[1]
Passenger transport by buses or coaches	Passenger-kilometers, Millions	Eurostat[2]
Share of rail passenger transport in total inland passenger transport	%	OECD Statistics[1]
Share of passenger transport by passenger car in total	%	OECD Statistics[1]

1. Data available from: https://stats.oecd.org/Index.aspx?DataSetCode=ITF_INDICATORS (accessed 25.1.2022).
2. Data available from: https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=road_pa_buscoa&lang=en (accessed 25.1.2022).

Housing: The localization of housing data required data on domestic consumption of electricity and on energy consumption for space heating. In addition to that, data on the composition of the energy mix for different energy sources for each country was also needed. Details on the domestic consumption of energy data needed for the localization of the housing footprint is shown in Table 6, including possible data sources from international publicly available databases. More accurate or recent data from, for example, national statistical offices, was used when available.

Table 6: Indicators and data sources for the calculation and localization of the carbon footprint of housing.

Indicator	Unit	Source
Country population	N	Eurostat[1]
Households consumption of	G	International Energy Agency[2]
Household energy	k	International Energy Agency[2]
Total energy supply (TES) by	%	International Energy Agency[2]

1. Data available from: https://ec.europa.eu/eurostat/databrowser/view/demo_pjan/default/table?lang=en (accessed 25.1.2022).
2. Data available from: http://iea.org (accessed 25.1.2022).

Food: The localization of food consumption data required food consumption statistics in terms of mean consumption in grams per day for a total of 23 food categories. Details on the categories of food considered is shown in Table 7. To further specify what included in each category, Table 7 shows the respective classification for each food category according to the UN Classification of individual consumption by purpose (COICOP). Food consumption data was collected from the EFSA Comprehensive European Food Consumption Database (accessible from https://data.europa.eu/data/datasets/the-efsa-comprehensive-european-food-consumption-database?locale=en). More accurate or recent data from, for example, national statistical offices, were used when available.

Table 7: Food categories considered for the calculation of the carbon footprint of food consumption. COICOP class refers to the UN Classification of individual consumption by purpose.

Food category	COICOP class
Poultry	01.1.2.2.4
Beef meat	01.1.2.2.1
Pork / piglet meat	01.1.2.2.2
Grains and grain-based products	01.1.1
Fish and other seafood	01.1.3
Liquid milk	01.1.4.1-01.1.4.3
Hard cheese	01.1.4.5
Soft cheese	01.1.4.5
Eggs and egg products	01.1.4.8
Condensed milk	01.1.4.6-01.1.4.7 01.1.4.9
Cream and cream products	01.1.4.6-01.1.4.7 01.1.4.9
Fermented milk products	01.1.4.6-01.1.4.7 01.1.4.9
Animal fats and oils	01.1.5
Fruits and fruit products	01.1.6-01.1.7
Starchy roots and tubers	01.1.6-01.1.7

Legumes, nuts and oilseeds	01.1.6-01.1.7
Vegetables and vegetable products	01.1.6-01.1.7
Snacks, desserts, and other foods	01.1.8
Sugar and confectionary	01.1.8
Coffee (beverage)	01.2.2
Tea (infusion)	01.2.3
Fruit and vegetable juices	01.2.1, 01.2.6-01.2.9, 02.1
Soft drinks	01.2.1, 01.2.6-01.2.9, 02.1
Alcoholic beverages	01.2.1, 01.2.6-01.2.9, 02.1

Other consumption: The localization of other consumption goods required data on final consumption expenditure of households for 7 purchased goods categories, and 4 leisure categories, plus data on household expenditures for pets. Details on the consumption data needed for the localization of the "other consumption" footprint is shown in Table 8. To further specify what included in each of the considered goods and leisure category, Table 8 shows the respective classification for each food category according to the UN Classification of individual consumption by purpose (COICOP). Data showed in Table 8 was collected from the Eurostat database (https://ec.europa.eu/eurostat/databrowser/view/NAMA_10_CO3_P3__custom_17389/default/table?lang=en). More accurate or recent data from, for example, national statistical offices, were used when available.

Table 8: Consumption goods and services considered for the calculation of the carbon footprint of "other consumption". COICOP class refers to the UN Classification of individual consumption by purpose.

Goods and services	COICOP class
Clothing & footwear	C03
Furninishing, household equipment and routine household maintenace	C05
Miscellaneous goods and services	C12
Audio-visual equipment	C091

Books, paper and magazines	C095
Hobby goods & outdoor equipment	C092 and 50% of C093
Tobacco	02.3
Recreational and cultural services	C094
Package travel expenditures	CP096
Restaurant & hotel services	C11

The data shown in Table 5-8 allowed, together with carbon intensity data, for calculating the average individual carbon footprint for the country considered. The share of missing data from international datasets constituted one challenge to overcome for implementing PSLifestyle, as implied further efforts for researching national statistics and data from literature.

3 Results

3.1 Localized questions and options for eight European countries

A first localization of the PSLifestyle tool was performed for the eight European countries included in the Horizon 2020 project PS Lifestyles (Table 4). The countries were initially selected for ensuring diversity in four main areas:

- Climate zone diversity, with at least one country in each of the main European climate zones (EEA, 2012),
- Diversity in attitudes towards the climate crisis (European Commission, 2009),
- Socio-economic diversity,
- Thematic local challenge diversity, covering all main four lifestyle domains (housing, mobility, food, other consumption)

For each of the eight countries considered, Step 1 of the localization resulted in one final set of questions (between 29 and 33) and options. For all countries, the set expanded from the original version of the tool that included only 23 questions. Table 9 shows the final set of questions for Finland as an example. The sets of questions and options localized for the rest of the countries can be found in Annex 1.

Table 9: Localized questions and options of the PSLifestyle tool for Finland

Questions and options			
Finland **Housing** 1. How many people live in your household? 1.1. 1 1.2. 2 1.3. 3 1.4. 4 1.5. 5 1.6. more than 5 2. What is the living area of your home? 2.1. Less than 20 m2 2.2. 20 - 50 m2 2.3. 51 - 80 m2 2.4. 81 -120 m2 2.5. 121 - 200 m2 2.6. More than 200 m2 3. What kind of electricity do you use? 3.1. Ecological electricity 3.2. Ordinary electricity	4. What kind of house do you live in? 4.1. Block of flats 4.1.1. Built before 1990 4.1.2. built 1990 - 2010 4.1.3. Built after 2010 4.2. Single-family house or semi-detached house 4.2.1. Built before 1990 4.2.2. built 1990 - 2010 4.2.3. Built after 2010 4.3. Terraced house 4.3.1. Built before 1990 4.3.2. Built 1990 - 2010 4.3.3. Built after 2010 5. What is the primary heating method of your home? 5.1. District heating 5.2. Green district heating, wood or pellets 5.3. Light fuel oil 5.4. Electricity 5.5. Natural gas 5.6. Ground-source heat pump or air-source heat pump 5.7. I don't know	6. Where in Finland do you live? 6.1. Southern Finland 6.2. Central Finland 6.3. Northern Finland 7. What is the room temperature in your home in winter? 7.1. Cool, about 19°C 7.2. Moderate, about 21°C 7.3. Warm, about 23°C 8. How much time per week do you spend having a shower? 8.1. About 30 minutes 8.2. About 60 minutes 8.3. About 120 minutes **Transport and tourism** 9. How many kilometers per week do you typically drive? 9.1. I don't drive 9.2. Less than 100 km 9.3. 100 - 400 km 9.4. More than 400 km 10. What does your car run on? 10.1. Petrol 10.2. Diesel 10.3. Gas or ethanol 10.4. Electricity 10.5. Hybrid	11. How many people usually travel with you in the car? 11.1. 4 or more people in addition to myself 11.2. 3 people in addition to myself 11.3. 2 people in addition to myself 11.4. 1 people in addition to myself 11.5. I drive on my own 12. How many kilometers per week do you travel by public transport? 12.1. I don't use public transport at all 12.2. Less than 100 km 12.3. 100 - 400 km 12.4. More than 400 km 13. How many hours have you travelled by plane in the past 12 months? 13.1. I have not travelled by plane at all 13.2. Less than 5 hours 13.3. 5 - 15 hours 13.4. 15 - 30 hours 13.5. More than 30 hours 14. Have you compensated for the emissions from your flights with voluntary carbon offset payments? 14.1. Yes 14.2. No

15. How many return trips have you made by ferry in the past 12 months?

    15.1. I have not travelled by ferry

    15.2. 1 - 4 trips
    15.3. 5 - 15 trips
    15.4. More than 15 trips

Food

16. What describes best your eating habits?

    16.1 I am not vegan nor vegetarian
    16.2. I don´t eat meat, but I do eat fish
    16.3. I am a vegetarian
    16.4. I am a vegan

17. How much do you eat compared with the other people at a meal?
    17.1. Less
    17.2. About the same amount
    17.3. More

18. How often do you have the following as part of your meal?
    18.1. beef or cold cuts
        18.1.1. Never
        18.1.2. 1 - 3 times a week
        18.1.3. 4 - 7 times a week
        18.1.4. Several times a day
    18.2. pork, chicken, fish, eggs
        18.2.1. Never
        18.2.2. 1 - 3 times a week
        18.2.3. 4 - 7 times a week
        18.2.4. Several times a day
    18.3. cheese
        18.3.1. Never
        18.3.2. 1 - 3 times a week
        18.3.3. 4 - 7 times a week
        18.3.4. Several times a day
    18.4. other dairy products (such as milk, yoghurt, quark, cream, butter)
        18.4.1. Never
        18.4.2. 1 - 3 times a week
        18.4.3. 4 - 7 times a week
        18.4.4. Several times a day

19. How many portions (cup/mug) of coffee, tea or juice do you drink every day?
    19.1. None
    19.2. 1 portion every now and then
    19.3. Fewer than 3 portions a day
    19.4. 3-5 portions a day
    19.5. More than 5 portions a day

20. How many meals per week you eat in or as take away from restaurants, cafeterias, canteens, or have delivered to you? 20.1. none
    20.2. 1 - 2 meals per week
    20.3. 3 - 5 meals per week
    20.4. More than 5 meals per week

21. How often do you throw food away?
    21.1. Never
    21.2. Seldom
    21.3. Every week
    21.4. Every day

Other consumption

22. How would you describe your shopping habits?

    22.1. I don't like shopping. I only buy what I need.
    22.2. I believe I shop less than an average person.
    22.3. I believe I shop the average amount.
    22.4. I believe I shop more than an average person

23. How often do you buy second-hand clothes or refurbished electronics?
    23.1. Never
    23.2. Seldom
    23.3. I buy about 50% of my clothes and electronics second-hand or refurbished
    23.4. I buy most of my clothes and electronics second-hand or refurbished

24. How much money do you spend on pets every month?
    24.1. I don't have a pet
    24.2. 50 euros
    24.3. 100 euros
    24.4. 200 euros or more

3.2 Existing footprint calculators and databases

One further result of Step 1 was a list of footprint calculators used in the eight countries. For each calculator, local organizations were asked to comment on possible strengths/drawbacks. The footprint calculators identified for each country differ in terms of scope, spatial and temporal scale, data sources and results (Table 10). No footprint calculator was identified for Estonia, Finland, and Italy. Some of the calculators identified require a free subscription to be used, but most of the calculators can be used without registering. The calculators identified have not been assessed in terms of accuracy and robustness of the methodology. Most of the calculators are focused on carbon footprint or the Ecological Footprint.

Besides calculators, local organizations were asked to indicate any carbon footprint database and study providing figures on the average carbon footprint of a person or household in each country, as well as other data related to carbon emissions. A list of the carbon footprint databases found by local organization is showed in Table 11, including details on the indicators referred to within broader databases (when appropriate), and a short description of the data. No databases were identified for Finland and Italy.

These lists of footprint calculators and databases do not aim at presenting a comprehensive list of existing calculators and data but presents the results of a first screening exercise in countries of PSLifestyle that informed the list of challenges for implementing the project.

All existing calculators and databases found confirmed that the most impactful consumption domains in terms of carbon footprint are Housing, Transport, and Food. This guided the definition of the tool with a focus on these domains. All data needed for a bottom-up calculation of carbon footprint was found, therefore there was no need to rely on cross country databases for implementing the tool.

Table 10: Footprint calculators found in the localization of PSLifestyle

Country	Calculator name	Main area of focus	Comments
Germany	My Ecological Backpack[1]	Natural raw materials	*"Questions are good and clear. They are clustered into the areas housing, consumer goods, nutrition, leisure, mobility and vacation. The estimated time needed to take a test is stated. The test progress is visible all the time (how much is left). Each thematic section has its color, which makes it easier to follow the questions. If a person cannot provide a detailed answer (e.g. amount of electricity consumed, there is an option to do an approximation (e.g. low/average/high). After completing each section, one can see intermediary results via a visualization tool. A pop-up message appears offering to skip some questions if they do not concern you. There are additional demographic questions to support further research (but it is offered to choose your gender only between "male" and "female"). One can go through all the questions again and see suggestions for reducing emissions with respect to the answers."*
Germany	German Federal Environment Agency (UBA) Carbon Calculator[2]	Carbon footprint of consumption	*"This is a really simple calculator, which does not allow for a high level of detail, but it is very accessible and fast to complete. The questions cover the areas of household, transportation, diet, and income. The results are valid for Germany. Default answers are provided, so that one only needs to adjust if something does not correspond to his/her lifestyle (it saves the time but might affect the results). There is an opportunity to create "My carbon scenario" to improve the user´s own lifestyle."*
Germany	WWF-Climate Calculator[3]	CO_2 emissions	*"After answering the questions, the user can see an added/subtracted amount of tonnes of CO_2 emitted. After answering some of the questions, tips or explanation to the questions are provided. The options provided as possible answers to the questions are ordered from the "most impacting" to the "least impacting" to the environment (this can be helpful to clarify the impact of different options). For some questions, such as about the usage of small electronic devices, the calculator uses average country's data (there is a short explanation text stating that otherwise the test would be too long)."*

Germany	Brot-für-die-Welt's Ecological Footprint Calculator[4]	Ecological Footprint	*"The calculator includes very beautiful animations, the pictures on the screen change depending on the user´s answers. There are intermediate results in the form of ecological footprint for each section and a German average. Under the results one can see a pie diagram showing the share of each section in the overall footprint. Criticism: not very detailed, the animation is a bit too slow."*
Germany	Klima-ohne-Grenzen's CO2-Footprint[5]	CO_2 Footprint	*"Allows to calculate CO2 footprint and select one certified climate protection project for offsetting."*
Greece	Elpe Renewables Carbon Footprint Calculator[6]	Carbon Footprint	*"Allows calculating the carbon footprint of housing and mobility (including public and private transport)."*
Greece	Kuehne + Nagel's Global Sea Logistics carbon calculator[7]	CO_2 emissions of ocean freight	*"Calculate the CO_2 emissions of ocean freight for the door-to-door transport of full containers and part loads of consumption goods."*
Greece	Heron S.A. carbon footprint calculator[8]	CO_2 Footprint	*"Includes footprint from housing, transport, and lifestyle (food, recycling, and purchases). It uses a very accessible visual interface."*
Portugal	Deco Proteste environmental impact calculator[9]	Environmental impact	*"It accounts for the environmental impacts of water use, energy use, mobility, waste (including food), and other consumption (including food) by means of a number of indicators. Proposes measures for the consumer to move towards a zero environmental impact. The mitigation measures proposed are specific to the profile of the user, and the calculator is very comprehensive. Nevertheless, the number of questions is extensive, which might discourage some users and visually, it is not the most appealing tool."*
Portugal	ABAE carbon footprint calculator[10]	Carbon and Ecological footprint of hotels	*"Specific for hotels in Portugal. It uses 13 metrics to estimate three impact indicators."*

Portugal	Ecological Footprint of Municipalities in Portugal[11]	Ecological Footprint	*"It is a local implementation of Ecological Footprint accounting by the Global Footprint Network focused on six Portuguese Municipalities. The approach followed by this calculator is similar to the one of the PS Lifestyle tool. A personal profile is determined and compared with the national average footprint. Possible commitments for behavioral change to reduce the footprint are presented. The calculator is accessible, intuitive, and fun to use."*
Slovenia	Ecological Footprint calculator[12]	Ecological Footprint	*"Following the Ecological Footprint approach, the calculator returns number of planets required by the user´s lifestyle, as well as the date of the relative overshoot day. The calculator then proposes actions to "push-the-date" and reduce the ecological footprint. The calculator uses very intuitive visualizations, and questions, options and additional details are presented very clearly. It allows for users to include optional details to further specify their answers."*
Slovenia	Umanotera carbon footprint calculator[13]	Carbon Footprint	*"The calculator is difficult to use and asks for very detailed information from the user. It returns quite detailed results."*
Slovenia	EKOŠOLA CO_2 calculator for schools[14]	CO_2 emissions from schools	*"Calculator specific for schools. It requires very detailed information."*
Turkey	Yarinin Suyu Water Footprint Calculator[15]	Water Footprint	*"This is a water footprint calculator that involves easy-to-approach questions to measure the water footprint of lifestyles. The questions focus only on household's water consumption such as using washing machine, dishwasher etc."*

Turkey	Lifestyle carbon footprint calculator[16]	Carbon Footprint	*"The calculator is focused on assessing the carbon footprint of housing, transportation and lifestyle. Questions on transportation includes what is the brand/model of private cars/motorcycles and distance travelled per year. Questions on lifestyle includes questions on the amount of exported/imported products used per year, plastic packing material used per week, recreational activities and use of financial services."*
Turkey	GTE Carbon Footprint Calculator[17]	Carbon Footprint	*"This is a simple and brief carbon footprint calculator. However, the questions are not well formulated and often unclear. The calculator focuses on use of electricity, heating and transportation. It provides a comparison of the user´s result with the average carbon footprint for Turkey."*
Turkey	REC Türkyie Carbon Footprint Calculator[18]	Carbon Footprint	*"It mainly focuses on food and mobility, leaving out other elements of consumption. The questions are not very clear and the calculator is not very accessible."*
Turkey	KONTEK Carbon Footprint Calculation System[19]	Carbon Footprint	*"The calculator is based on 10 questions on lifestyles, providing a very simplified measure of carbon footprint. One interesting question included in this calculator is about the use of delivery services per month."*

The footprint calculators are accessible from: 1. https://www.ressourcen-rechner.de/ – 2. https://uba.co2-rechner.de – 3. https://www.wwf.de/themen-projekte/klima-energie/wwf-klimarechner - 4. https://www.fussabdruck.de/ - 5. https://klimaohnegrenzen.de/oekologischer-co2-fussabdruck - 6. http://www.elperes.gr/anthrakiko-apotypoma - 7. https://gr.kuehne-nagel.com/-/knowledge/carbon-footprint-calculator - 8. https://www.heron.gr/co2-footprint - 9. https://www.deco.proteste.pt/sustentabilidade/pegada-ecologica - 10. https://greenkey.abae.pt/best_practice/calculadora-da-pegada-de-carbono - 11. https://www.pegadamunicipios.pt/calculadora - 12. http://izo.si/izracunaj-ekoloski-odtis - 13. https://www.umanotera.org/izracunaj-svoj-ogljicni-odtis - 14. https://www.ekoskladovnica.si/CO2Kalkulator – 15. https://www.yarininsuyu.com/ - 16. http://www.karbonayakizi.com/calculator/calculator.aspx - 17. https://www.egeorman.org.tr/hesaplayicilar/karbon-ayakizi - 18. https://rec.org.tr/projearsivi/denizli_idep/karbon-ayakizi-hesaplama-araci - 19. https://yesilbiradim.com/hesaplama (all accessed 25.01.2022).

Table 11: List of databases and studies which include average carbon footprint values found in the localization of PSLifestyle.

Country	Database or source	Indicator (where appropriate)
Estonia	Statistics Estonia[1]	Greenhouse gas emissions per capita
Germany	German Federal Environment Agency (UBA) Carbon Calculator[2]	Average German CO_2 Footprint
Germany	German Environmental Agency Report 2015 "Living climate-neutral - Consumers are getting started on climate protection" (p. 9)[3]	Average German CO_2 Footprint
Germany	Klima-ohne-Grenzen's CO2-Footprint[4]	Average German CO_2 Footprint
Greece	Ministry of the Environment and Energy, 2019: "National Energy and Climate Plan"[5]	Multiple indicators
Greece	Global Carbon Budget Report 2019[6]	Consumption-based CO_2 emissions
Portugal	Ecological Footprint of Portugal Municipalities[7]	Ecological Footprint
Portugal	Grunewald N. et al. 2015: "The Ecological Footprint of Mediterranean Diets" In: Feeding Expo Milano 2015 with Mediterranean Perspectives, CIHEAM.[8]	Ecological Footprint of food consumption
Slovenia	Care 4 Climate[9]	Per capita average carbon footprint of Slovenia
Slovenia	Kovač N. and Polanec V. 2013: "Ecological Footprint" Slovenian Environment Agency.[10]	Ecological Footprint of Slovenia
Turkey	Carbon Brief 2018: The Carbon Brief Profile: Turkey.[11]	Greenhouse gas emissions
Turkey	Turkey 2021 National Inventory Report (NIR).[12]	Greenhouse gas emissions

The databases and studies are accessible from: 1. https://www.stat.ee/et/avasta-statistikat/valdkonnad/keskkond/kliima – 2. https://uba.co2-rechner.de - 3. https://www.umweltbundesamt.de/sites/default/files/medien/378/publikationen/klimaneutral_leben_4.pdf - 4. https://klimaohnegrenzen.de/oekologischer-co2-fussabdruck - 5. https://ec.europa.eu/energy/sites/ener/files/el_final_necp_main_en.pdf - 6. https://www.icos-cp.eu/science-and-impact/global-carbon-budget - 7. https://www.pegadamunicipios.pt/resultados - 8. https://www.ciheam.org/publications/190/010_-_Galli.pdf – 9. https://zaveza.care4climate.si/kaj-je-ogljicni-odtis - 10. http://kazalci.arso.gov.si/en/content/ecological-footprint-1 - 11. https://www.carbonbrief.org/carbon-brief-profile-turkey - 12. https://unfccc.int/documents/271544 (all accessed 25.01.2022).

The data and the average footprint values available from existing calculators and databases are often not comparable, as for example refer to different consumption domains, years, age/income or other groupings, or are calculated by means of different methodologies with different underlying assumptions. However, some of the databases and studies identified in Step 1 are suitable for cross-country comparisons that can offer a first glimpse at what are the different levels of carbon footprints and different criticalities across countries. Out of the databases and studies identified by local organizations, the Global Carbon Budget dataset and the Ecological Footprint database allows for meaningful comparisons of carbon footprints between countries.

The Global Carbon Budget dataset is produced annually by researchers of the Global Carbon Project (GCP) and is used as the basis for the Global Carbon Budget report (Friedlingstein et al., 2019). The report determines the input of CO2 to the atmosphere by emissions from human activities, balanced by output (storage) in the carbon reservoirs on land or in the ocean. In this dataset, consumption-based emissions are national emissions which have been adjusted for trade (i.e. territorial/production emissions minus emissions embedded in exports, plus emissions embedded in imports). Across the eight European countries considered in PS Lifestyle, consumption-based emissions vary from 4.7 to 11.3 tonnes of CO2e per capita per year (Fig. 4).

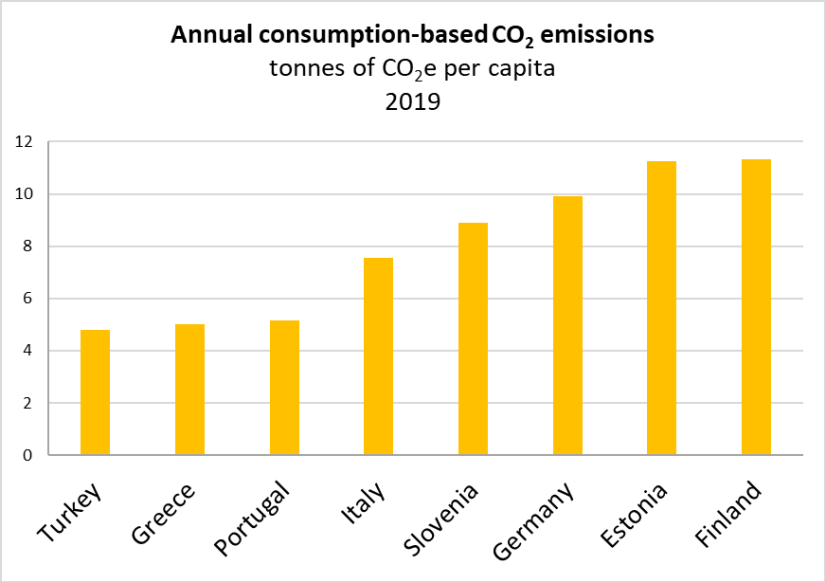

Figure 4. Annual consumption-based CO2 emissions in the countries included in PS Lifestyle. Data are from the Global Carbon Budget report 2019 (Friedlingstein et al., 2019).

The Ecological Footprint is a consumption-based measure of how much area an individual, population, or activity requires to produce all the resources it consumes and to absorb the waste it generates, using prevailing technology and resource management practices (https://data.footprintnetwork.org/). It considers six land-types, namely "carbon", "fishing grounds", "cropland", "built-up land", "forest products", and "grazing land". The ecological footprint of the "carbon" land-type, or carbon footprint, is a measure of the CO2 emissions associated with fossil fuel use in a country, converted into the biologically productive areas (i.e. ecosystems) necessary for absorbing this CO2. The ecological footprint is calculated yearly for the world countries by the Global Footprint Network (GFN). This allows for an analysis of changing impacts of consumption over time (including carbon emissions), as well as for comparisons of levels of emissions between countries.

The carbon footprint can vary substantially across European countries, for example from 2.23 gha/person/year in Turkey to about 3.18 gha/person/year in Estonia, Germany, and Slovenia (Fig. 5).

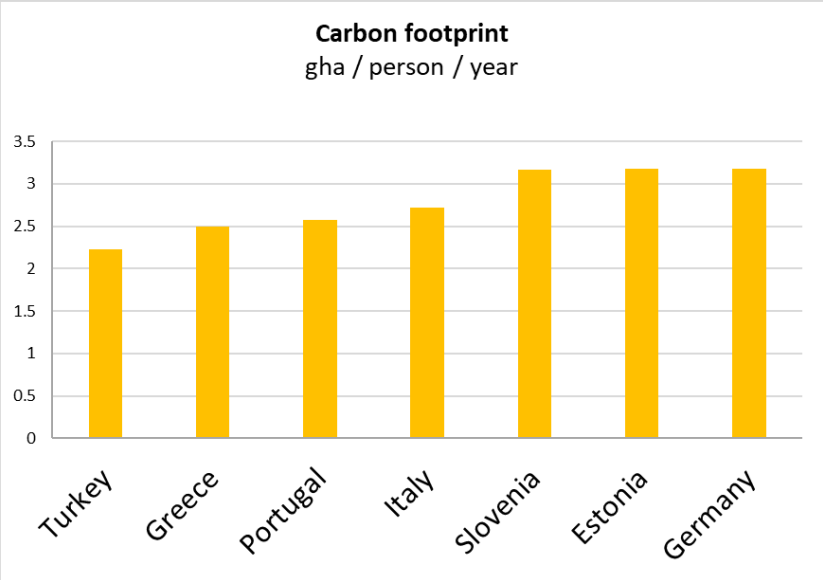

Figure 5. Carbon footprint of the countries of PS Lifestyle by means of ecological footprint accounting. Data from: data.footprintnetwork.org (accessed 10.2.2022).

3.3 Inclusiveness of the PSLifestyle tool

The localization of the PSLifestyle tool for Estonia, Finland, Germany, Greece, Italy, Portugal, Slovenia, and Turkey, allowed for a first mapping of specific aspects that should be considered to ensure wide and equal accessibility to the tool and the implementation of sustainable lifestyles in different European countries. It also allowed for a first mapping of the most important population groups that are, or are at risk of, being marginalized and vulnerable in respective countries and that the project should attempt to reach.

The most important aspects that emerged from Step 1 with regards to the accessibility and inclusiveness of the tool are briefly described below.

Income and risk of poverty rate: Income emerged as one important element to consider when using the PSLifestyle tool, including localizing the questions and options, as well as proposing the implementation of sustainable lifestyles once the questions have been answered. The questions should be relevant across income groups, while the options should cover all possible cases considering a range of consumption levels and behaviors. Regarding sustainable lifestyles and consumption choices, it needs to be considered that people could prefer cheaper options, regardless of their environmental impacts, if they are struggling to meet their needs due to an insufficient level of disposable income. To reflect this, differences in income levels and risk of poverty rates have to be considered when adapting the PSLifestyle tool from one country to another as well as for comparing results between countries in a meaningful way. Specifically, one question will be added in the PSLifestyle tool for all countries to track how the user base is distributed across income groups. These groups are defined by net equivalized disposable income levels which account for differences in both income levels and poverty rates across countries, following the OECD Income Distribution Database methodology (OECD, 2017).

As highlighted in numerous scientific studies, carbon footprints strongly correlate with income levels both at the national and individual/household level (Gore, 2021). For example, in the report “1.5-Degree Lifestyles: Towards a Fair Consumption Space for All”, individual carbon footprints of high-income countries are found to be up to five times higher than those of middle and low-income countries (Akenji et al., 2021). Globally, the top 10% income earners are responsible for about half of total lifestyle consumption emissions, while the bottom 50% for only 10% (Gore, 2021).

Of the eight countries considered in the first localization of the PSLifestyle tool, 7 are classified as high-income, and 1 as upper-middle income, according to the World Bank Atlas method. Income distribution, however, differs widely across these countries, with a Gini Index ranging from 24.6 for Slovenia to 41.9 for Turkey (World Bank estimate, available from https://data.worldbank.org/indicator/SI.POV.GINI?name_desc=false). Furthermore, the share of population at risk of poverty or social exclusion also changes substantially among the 8, from 14% in Slovenia to 34% in Turkey (Fig. 6). This impacts the implementation of PSLifestyle at several stages, from defining

a user base and a group of participants to Citizen Science labs that is representative of the income distribution observed throughout each country, to tailoring smart actions to different users.

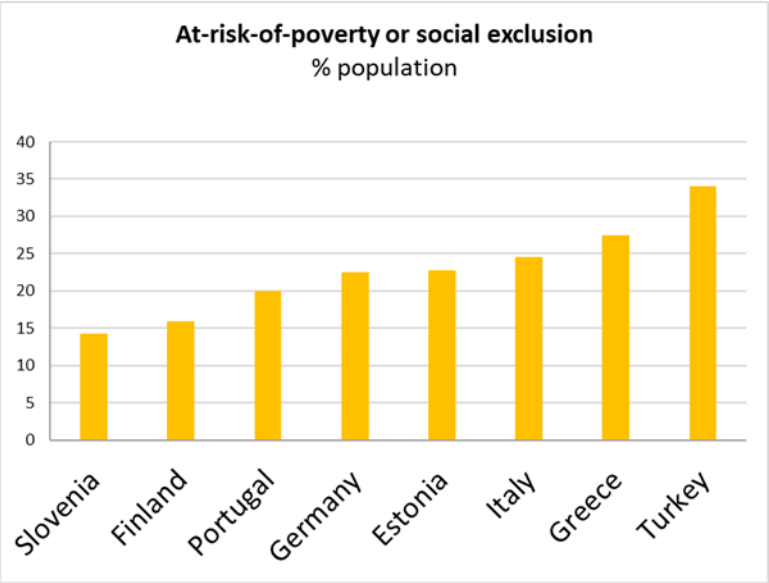

Figure 6. Share of population at risk of poverty or social exclusion in the countries of PSLifestyle. Data from: https://ec.europa.eu/eurostat/databrowser/view/ilc_peps01n/default/table?lang=en (accessed 10.2.2022).

The impact of low incomes on the consumption domains considered in PSLifestyle is documented in many instances. For example, in 2020 over 20% of population in Greece could not afford to keep their home adequately warm, compared to less than 2% in Finland (values from the same survey for the countries of PS Lifestyle are shown in Figure 7).

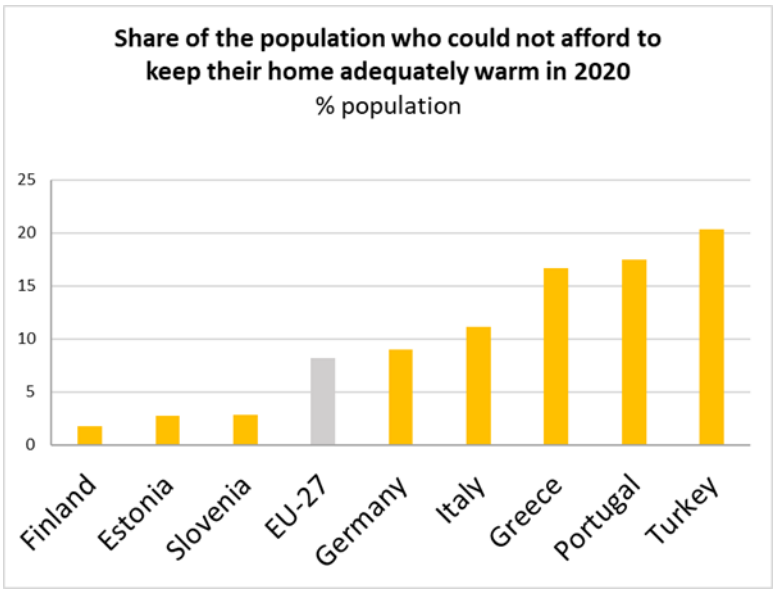

Figure 7. Share of the population who could not afford to keep their home adequately warm in 2020 for the countries of PSLifestyle. Data from: https://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do (accessed 10.2.2022).

Educational levels: Educational levels and educational attainment by a population have an impact on carbon footprints. Considering countries, an increasing educational attainment is often associated with a minor increase in carbon emissions, overcompensated by substantial increases in the Human Development Index (HDI) (O´Neill et al., 2020). At the same time, populations are significantly less vulnerable to climate change if efforts are made to improve their level of education. Conversely, populations are more vulnerable to climate change if educational improvements slow (IIASA, 2020).

A recent study by The World Bank concluded that, across countries, education quality is positively associated with employment in industries with a lower carbon footprint, reducing an economy's reliance on emissions for production (Macdonald and Patrinos, 2021). One of the implications of that is that investments in education quality are needed for better climate adaptation and for reducing inequalities in carbon emissions.

As an indication of educational attainment across the 8 countries for which PSLifestyle was localized, mean years of schooling vary from 7.7 in Turkey to 14.1 in Germany (Fig. 8), while the share of population with tertiary education varies from 29% in Italy to 45% in Slovenia (Fig. 9). This impacts the implementation of PSLifestyle, as educational attainment levels influence consumption choices and the implementation of sustainable lifestyle options.

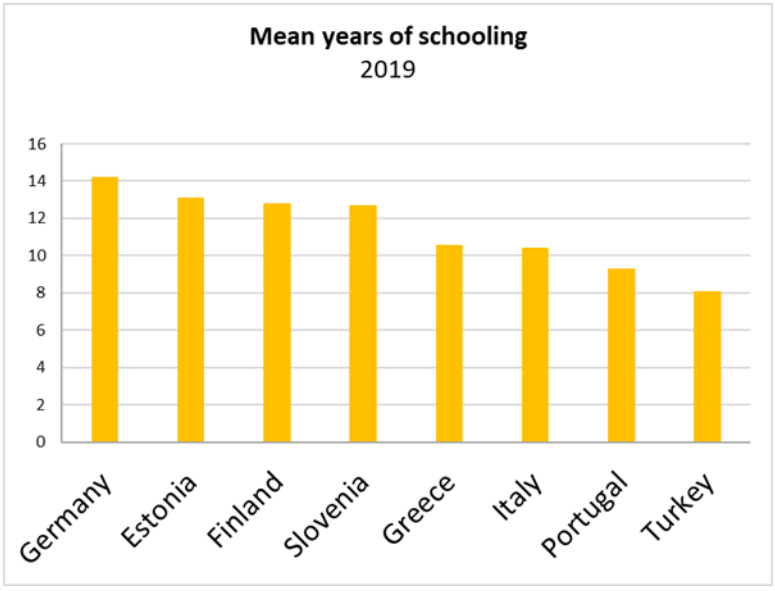

Figure 8. Mean years of schooling in the countries of PSLifestyle (UNDP, 2020).

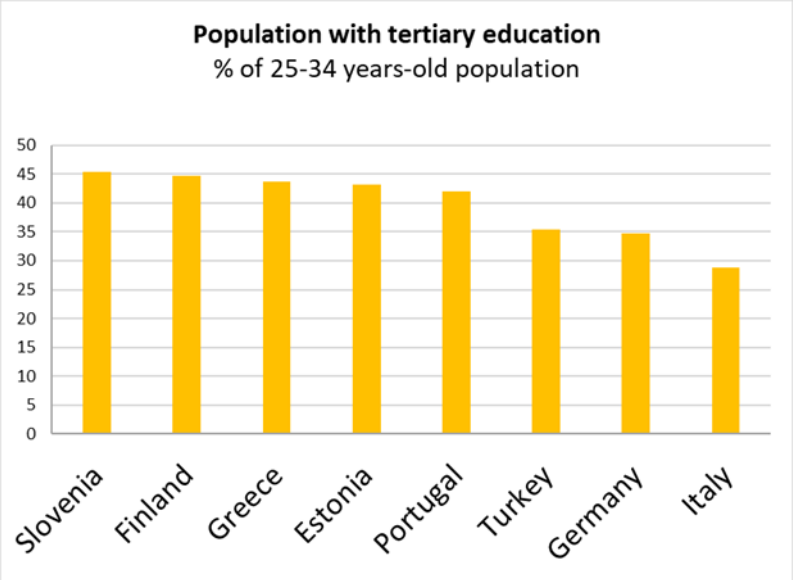

Figure 9. Share of population with tertiary education in selected EU countries. Data from: https://data.oecd.org/eduatt/population-with-tertiary-education.htm (accessed 10.2.2022).

Digital skills: The PSLifestyle tool is a is a mobile-optimized website, accessible through any browser on desktop, smartphones, and tablet. Its use requires a certain capacity to have access to and be able to use digital devices. A level of digital skills below a certain minimum may exclude potential users from accessing the tool, limiting the possible user base. Theoretically, if a large share of a country´s population does not meet these minimum levels of digital skills, the results of the tool implementation may not be representative enough of the whole country.

When localizing PSLifestyle, it is informative to look at cross-country indicators of digital skill levels. If the country considered for the localization is characterized by low digital skill levels, this should be identified as an element of risk, and alternative solutions should be developed. In particular, targeted communication and marketing strategies will need to be defined in cases of low digital skill levels.

According to Eurostat, the share of population with at least basic digital skills varies from 42% for Italy to 76% for Finland across the 8 countries for which PSLifestyle was first localized (Figure 10). Furthermore, the share of population with at least basic digital skills is below the EU average of 56% for 5 of these 8 countries. This demands a further refinement of the localization for reaching out to potential users with below basic digital skills, which for some countries represent over half of the population. Considering this picture, the tool has been designed with a very simple interface and as a website app, instead of an application that would need to be downloaded and installed via an app store. Furthermore, the methodology on which the calculation of carbon footprints and

emission reduction potentials of different lifestyle options are based is specifically designed to require as little input as possible from the users.

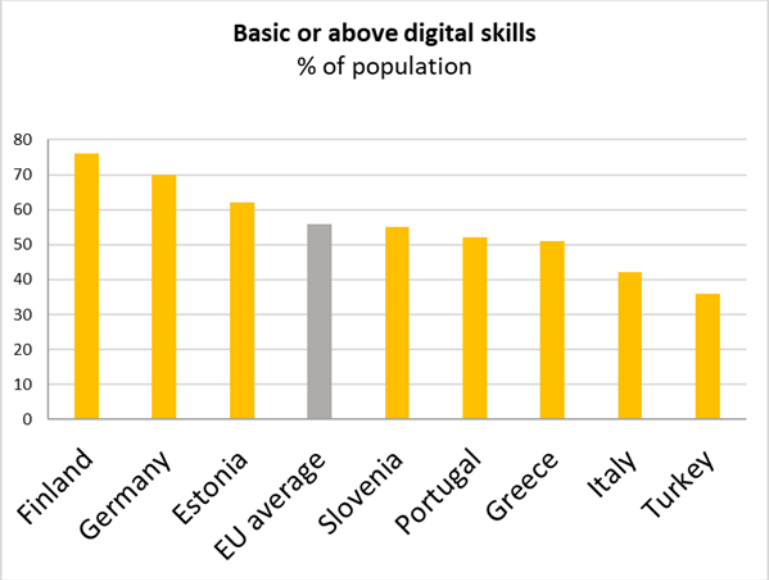

Figure 10. Share of population with basic or above basic digital skills in selected EU countries. Data from: https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=isoc_sk_dskl_i&lang=en (accessed 10.2.2022).

Access to the internet: Besides needing the ability to interact with the tool using a device, the users of PSLifestyle would need to have access to the internet for enabling data collection and the implementation of subsequent steps to the questions and answers phase of the tool. Internet access, however, can substantially change across and within countries, and alternative solutions should be considered whenever potential user groups encounter difficulties for accessing the internet.

The Connectivity dimension of the Digital Economy and Society Index (European Commission, 2021) offers a comprehensive overview of the level of access to the internet across EU countries. It considers a total of 10 indicators and allows for comparisons between countries on the basis of an aggregate score and a ranking system. The indicators considered are (units within brackets): overall fixed broadband take-up (% households), at least 100 Mbps fixed broadband take-up (% households), at least 1 Gbps fixed broadband take-up (% households), fast broadband (NGA) coverage (% households), fixed very high capacity network (VHCN) coverage (% households), 4G coverage (% populated areas), 5G readiness (assigned spectrum as a % of total harmonized 5G spectrum), 5G coverage (% populated areas), mobile broadband take-up (% individuals), broadband price index (score = 0-100).

Across the 8 countries considered in the first localization of PSLifestyle, the Connectivity score goes from 27.7 for Greece (ranking 27th in the EU) to 58.0 for Germany (ranking 6th in the EU) (no data available for Turkey). Out of these 8 countries, 4 have a Connectivity score lower than the EU average of 50.2 (Fig. 11).

The lack of connectivity may pose a risk to the widespread use of the tool. However, the percentage of population with good connectivity score across the 8 project countries is compatible with the user basin and related KPIs of the project. The nature of the tool makes it difficult to design it in a way that allows offline uses. However, the project will generate material, in the form of reports, data, processed data, and other printable material that could be used to further communicate on the tool and on the relevance of changing lifestyles for addressing climate change even in communities with low connectivity.

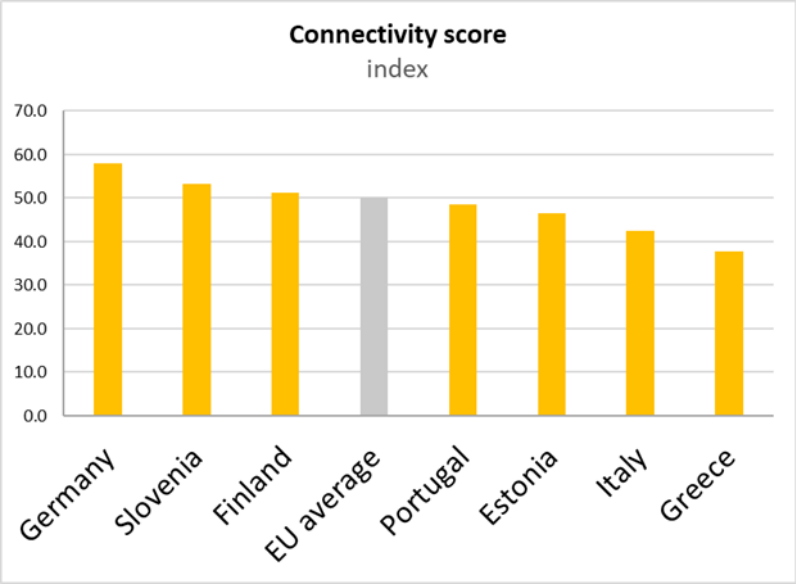

Figure 11. Connectivity score in selected EU countries. The score considers 10 indicators including broadband and 4G/5G take-up and coverage (European Commission, 2021).

4 Main challenges and lessons learned

The methodology followed for the localization in eight European countries allowed for identifying several challenges to overcome for implementing PSLifestyle. Some of these challenges are common across countries, while some others are specific. The challenges are summarized per country in Table 12 and are discussed in this section. The challenges were organized in different areas: i) questions and data, ii) footprint, and iii) accessibility and implementation.

Questions and data refer to challenges that emerged during the localization of the questions and are partly characterized by the final number of questions in the localized versions of the tool. One overarching challenge for

localizing the PSLifestyle tool is to maintain a good balance between the accessibility and the complexity/comprehensiveness of the test. In many cases, the localization of the test implies adding a number of questions, thus risking producing an overly complex or long-to-complete test. In other cases, suggested changes in the questions and options risk introducing further complexity both in terms of the capacity of all users to provide precise answers, and in terms of increased complexity of the footprint calculation process.

In this vein, the total number of questions in the Lifestyle tool contributes to characterize the level of challenge for implementation in different countries, although it should be considered together with several other aspects (Table 12).

Other challenges identified in the "questions and data" area are for countries with a lack of existing footprint calculators and databases, as well as for countries with a high share of missing consumption data from cross-country datasets. The share of missing consumption data from cross-country datasets were generally low across countries, going from no missing data for Finland, Germany, Italy and Portugal, to 27% missing data (on average across the four consumption domains considered) for Turkey.

While national statistics are available and are often more accurate than international datasets, these latter would complement national data and allow for cross-country comparisons as they consistently use standardized accounting methods and categorizations of consumption. The two main cross-country datasets identified in the localization of PSLifestyle (the Global Carbon Budget and the Ecological Footprint) were used to provide a very first comparison of consumption footprint across the eight countries. Despite based on different accounting methods, these two datasets return similar results, with Turkey having the lowest per capita carbon footprint, and Germany and Estonia (and Finland) the highest. Further challenges related to specific aspects of consumption emerged from the localization. The Carbon Footprint Index in particular showed an interesting perspective, highlighting both the level of challenge and potential opportunities for reducing the footprint of food consumption by switching from animal-based to non-animal based food. Major challenges (and also reduction potentials) were identified for Finland and Greece, while lower for Estonia and Turkey.

Table 12: Challenge areas assessed in the localization of PSLifestyle. Dark shaded cells indicate a higher level of challenge, considering the direction of the indicators and the average value across the eight countries. Light shaded cells indicate a lower level of challenge

	Challenges indicators	Estonia	Finland	Germany	Greece	Italy	Portugal	Slovenia	Turkey
Questions and data	Number of questions	28	24	26	24	26	24	29	27
	Existing calculators found	0	0	5	3	3	3	3	5
	Existing footprint datasets found	1	3	2	2	0	2	2	2
	Average share of missing data	19	0	0	6	6	0	0	27
Footprint	Consumption-based CO_2 emissions (tonnes CO_2e/capita)	11.2	11.3	10	5	7.5	5.2	8.9	4.8
	Carbon Footprint (Ecological Footprint) (gha/capita)	3.2	NA	3.2	2.5	2.7	2.6	3.2	2.2
	Food Carbon Footprint Index (kg CO_2e/capita)	774.8	1409.8	997	1395.8	1108.8	1086.4	1042.6	774.9
	Total passenger road transportation per capita (Passenger-km)	NA	13331	13028	4105	15051	9803	14044	3556
	Electricity consumption (Residential) (kWh/capita)	1556	4074	1521	1627	1107	1284	1621	672
	Other consumption expenditures (€/capita)	3647	7199	7579	3680	6078	5167	4302	1405
Accessibility and implementation	At-risk-of-poverty or social exclusion (% population)	22.8	15.9	22.5	27.5	24.6	20	14.3	34.1
	Share of the population who could not afford to keep their home adequately warm (% population)	2.7	8.2	1.8	9	16.7	11.1	17.5	2.8
	Mean years of schooling	13.1	12.8	14.2	10.6	10.4	9.3	12.7	8.1
	Share of population with tertiary education	43.1	44.7	34.8	43.7	28.8	41.9	45.4	35.3
	Basic or above digital skills (% population)	62	56	76	70	51	42	52	55
	Connectivity score	46.6	50.2	51.3	58.0	37.7	42.4	48.5	53.2

Regarding mobility, the localization of consumption data showed a higher recurrence to road transport (in terms of Total passenger road transportation per capita, in Passenger-kilometers) in Italy and Slovenia, while a lower recurrence in Turkey and Greece. This points towards a higher reduction potential and a higher emphasis to be put on actions towards reducing the carbon footprint of mobility in the former countries.

Similarly, the localization of consumption data for the housing domain showed different levels of energy consumption across countries. Considering use of electricity, Finland has the higher values, while Turkey the lowest, while values are more similar amongst the other countries. However, it is important to keep in mind that both for mobility and consumption of electricity the share of different transport modes and energy sources, and the relative carbon intensities, would have to be considered for a comprehensive assessment.

Regarding other consumption, the total spending per capita per year differ consistently across countries, pointing towards consumption of other goods and services as a possible area of focus for designing country-specific reduction actions.

As showed in the Results, different indicators of inclusivity and digital access showed a rather varied picture across countries. Different poverty levels in each country would have to be reflected into different recommended actions, making sure that availability and affordability of alternatives are thoroughly considered. This is of particular importance for countries with higher shares of population in risk-of-poverty or social exclusion, higher income inequalities, and lower average income levels. Education levels and digital skills are also different across countries, further calling for a context-specific design of possible reduction actions and on implementing the digital tool in the most inclusive way.

Besides challenges, the localization presented many opportunities for improving the PSLifestyle tool, beyond the scope of rendering it country-relevant. The final result of the localization should not just be a series of questions tailored to specific contexts, but an overall improved tool both in terms of accessibility and level of detail of the calculation process and the expected results.

In the localization of the PSLifestyle tool for the eight European countries of the PS Lifestyles project, several lessons were learned on the basis of recommendations done by local organizations from more than one country. These commonalities and issues are essential to be tracked, as by addressing them the PSLifestyle tool can be further improved. In particular, the following suggestions were brought forward:

A “smarter” test with conditional questions: many local organizations suggested implementing a “smarter” version of the test by introducing conditional questions that are asked or not to the users depending on their answers to previous questions. This “smarter” test was implemented, constituting a substantial improvement to the user’s experience. For example, one question was added to the test asking users “What best describes your eating habits?” with the following options: “I am not a vegan or vegetarian”, “I don´t eat meat, but I do eat fish”,

"I am a vegetarian", or "I am a vegan". Depending on the answer to this question, users are then directed to different ones regarding how much of different food categories they consume.

Ask clearer questions: all local organizations suggested improving some of the questions, in particular by clarifying what the users shall consider when accounting for some of their consumption activities. For example, when asking how much the user travels by plane on average in a year, partners asked to specify if business trips shall be included. This suggestion can be implemented in the test by either improving the questions wording or adding a tooltip showing more details on what the question specifically refers to.

Avoid to group together many different elements: in order to reduce the total number of questions, and to maintain a light enough structure of the tool, many consumption items are listed together in single questions. This is particularly evident for example for the following questions on food consumption: "How many portions (cup/mug/pint/glass) of coffee, tea, juice, beer or wine do you drink every day?" "How often do you have pork, chicken, or eggs as part of your meal?". The aggregation of such different food items in one single question was criticized by many country partners that noted how, even if these food items may fall within a common range of carbon intensities, users can get confused by such questions when they do not consume at all any of the items included (for example, they do not drink alcoholic beverages). Following this feedback, these questions were split (in most of the cases) into multiple questions. While this increases the number of questions in the tool, we believe it allows for a clearer set of questions with a higher accessibility.

Avoid questions that ask for comparing oneself to "the average person": the PSLifestyle tool considers the national average carbon footprint of consumption in a country and adjusts it based on the answers selected or provided by the users to the questions posed. On this basis, several questions ask the users to compare their consumption levels with the ones of an average person in their country, for example "How much do you eat compared to an average person in your country?". This rationale was criticized by many local organizations as produces very subjective considerations, hampering the accuracy of the test results. Following this feedback, such type of questions have been removed from the test or, whenever not possible for the purpose of the calculation process, a tooltip has been added reporting average consumption data for the relative item/category.

Minimizing the impact of the COVID-19 pandemics on the tool´s results: the COVID-19 pandemics has been altering the way and amounts we consume, including how much and often we travel for touristic or leisure purposes (Hodbod et al., 2021). In many cases, our carbon footprint during the COVID-19 pandemics is quite different from our footprint before that. This called for adjusting a number of the questions that referred to consumption levels "in the past year" or similar. In general, these questions have been reformulated referring to "normal" average yearly consumption levels, in order to reduce the impact of the current COVID-19 pandemics on the results. For example, the question "How many hours you travelled by plane during the past 12 months?" has been reformulated as "How many hours per year you normally travel by plane?".

Postal code: knowing where in the country the users of the PSLifestyle tool live may or may not be relevant for the calculation of their carbon footprint. In some cases, such is the case of Finland for example, different consumption demands characterize different regions (e.g. with higher demand for heating in the North, and lower in the South of Finland). In any case, knowing where the users live do serve other purposes (for example for research), in particular with regards to the post-processing of the results of the tool.

This information in fact allows for studying possible geographical clusters of different footprint levels, and mapping the distribution of particular consumption patterns. One option to consider in this vein is to include a question which asks users to enter their postal codes (possibly as an optional question at the end of the test). In this way, will be possible not only to locate users (and results) on different regions in a country, but also to visualize further elements, such as if one user lives in a city or in the countryside.

Tailoring questions and options to different countries: some of the questions of the tool ask the users to provide an estimate of some aspects of their consumption. These include questions such as on the size of one's living space, the number of km traveled by car per week and similar. Following inputs from country partners, it emerged how this kind of questions must be formulated differently in different contexts. For example, in some cases it would be easier for the users to indicate how many rooms are in their house, instead of how big the house is in terms of m2. Or, for example, it must be easier for users from one country to indicate how many km they travelled per year, instead of per week. There may be different underlying reasons for these differences, and each case has its specificities to be considered.

5 Conclusion

The localization of PSLifestyle is a replicable exercise needed for maximizing the applicability and potential impact of the PSLifestyle tool in different countries or other contexts. By placing the attention on framing questions and options that speak to local citizens, also considering different configurations of consumption emissions and the different needs and possibilities across countries, it is possible to bridge the gap between science-based evidence and daily actions.

This localization process showed how different aspects of consumption and lifestyle vary across countries. It is an essential first step for informing the design of future versions of the PSLifestyle tool in a more adaptable way. This includes identifying, considering, and overcoming challenges posed by missing data, low levels of digital skills, differences in income and other factors across countries, and to place the emphasis on areas of consumption of particularly high impact.

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Annex I: Table A1: Localized questions and options of the PSLifestyle tool for Estonia

Questions and options			
ESTONIA **Housing** 1. How many people live in your household? 1.1. 1 1.2. 2 1.3. 3 1.4. 4 1.5. 5 1.6. more than 5 1. What is the living area of your home? 2.1. Less than 20 m2 2.2. 20 - 50 m2 2.3. 51 - 80 m2 2.4. 81 -120 m2 2.5. 121 - 200 m2 2.6. More than 200 m2 2. What kind of electricity do you use? 3.1. Green electricity 3.2. Ordinary electricity 3.3. I don't know	3. What kind of house do you live in? 4.1. Block of flats 4.1.1. Built before 1990 4.1.2. Built 1990 - 2000 4.1.3. Built 2000-2010 4.1.4. Built 2010-2020 4.1.5. Built after 2020 4.2. Single-family house or semi-detached house 4.2.1. Built before 1990 4.2.2. Built 1990 - 2000 4.2.3. Built 2000-2010 4.2.4. Built 2010-2020 4.2.5. Built after 2020 4.3. Terraced house 4.3.1. Built before 1990 4.3.2. Built 1990 - 2000 4.3.3. Built 2000-2010 4.3.4. Built 2010-2020 4.3.5. Built after 2020 4. What is the primary heating method of your home? 5.1. District heating 5.2. Green district heating, wood or pellets 5.3. Light fuel oil 5.4. Electricity 5.5. Natural gas 5.6. Ground-source heat pump or air-source heat pump	6. What is the room temperature in your home in winter? 6.1. Cool, about 19°C 6.2. Moderate, about 21°C 6.3. Warm, about 23°C 7. How much time per week do you spend having a shower? 7.1. About 30 minutes 7.2. About 60 minutes 7.3. About 120 minutes 8. How much time per week do you spend having a bath? 8.1. I never have a bath 8.1 About 30 minutes 8.2 About 60 minutes 8.3 About 120 minutes **Transport and tourism** 9. How many kilometers per week do you typically drive by car? 9.1. I don't drive 9.2. Less than 100 km 9.3. 100 - 400 km 9.4. 400-600 km 9.5. More than 600 km 10. What does your car run on? 10.1. Petrol 10.2. Diesel 10.3. Gas or ethanol 10.4. Electricity 10.5. Hybrid 10.6. Biogas	11. How many people usually travel with you in the car? 11.1. 4 or more people in addition to myself 11.2. 3 people in addition to myself 11.3. 2 people in addition to myself 11.4. 1 people in addition to myself 11.5. I drive on my own 12. How many kilometers per week do you travel by public transport? 12.1. I don't use public transport at all 12.2. Less than 100 km 12.3. 100 - 400 km 12.4. More than 400 km 13. How many hours per year do you normally travel by plane? 13.1. I have not travelled by plane at all 13.2. Less than 5 hours 13.3. 5 - 15 hours 13.4. 15 - 30 hours 13.5. More than 30 hours 14. Have you compensated for the emissions from your flights with voluntary carbon offset payments? 14.1. Yes 14.2. No 15. How many return trips per year do you normally make by ferry? 15.1. I have not travelled by ferry 15.2. 1-4 trips 15.3. 5-15 trips 15.4. More than 15 trips

16. How many times a week do you walk or cycle to work or go to school (instead of driving or using public transport)?
    16.1. Never
    16.2. 1 time a week
    16.3. 2-3 times per week
    16.4. 4-5 times per week

Food

17. What describes best your eating habits?
    17.1 I am not vegan nor vegetarian
    17.2. I don´t eat meat, but I do eat fish
    17.3. I am a vegetarian
    17.4. I am a vegan

18. How much do you eat compared with the other people at a meal?
    18.1. Less
    18.2. About the same amount
    18.3. More

19. How often do you have the following as part of your meal?
    19.1. beef or cold cuts
        19.1.1. Never
        19.1.2. 1 - 3 times a week
        19.1.3. 4 - 7 times a week
        19.1.4. Several times a day
    19.2. pork, chicken, fish, eggs
        19.2.1. Never
        19.2.2. 1 - 3 times a week
        19.2.3. 4 - 7 times a week
        19.2.4. Several times a day
    19.3. cheese
        19.3.1. Never
        19.3.2. 1 - 3 times a week
        19.3.3. 4 - 7 times a week
        19.3.4. Several times a day
    19.4. other dairy products (such as milk, yoghurt, quark, cream, butter)
        19.4.1. Never
        19.4.2. 1 - 3 times a week
        19.4.3. 4 - 7 times a week
        19.4.4. Several times a day

20. How many portions (cup/mug) of coffee, tea or juice do you drink every day?
    20.1. None
    20.2. 1 portion every now and then
    20.3. Fewer than 3 portions a day
    20.4. 3-5 portions a day
    20.5. More than 5 portions a day

21. How many portions (pint/glass) of beer or wine do you drink every day?
    21.1 none
    21.2. 1 portion every now and then
    21.3. Fewer than 3 portions a day
    21.4. 3-5 portions a day
    21.5. More than 5 portions a day

22. How many meals per week you eat in or as take away from restaurants, cafeterias, canteens, or have delivered to you?
    22.1. None
    22.2. 1 - 2 meals per week
    22.3. 3 - 5 meals per week
    22.4. More than 5 meals per week

23. How much of your food leftovers you throw away?
    23.1. None, all leftovers get composted
    23.2. Minimal
    23.3. I don’t care
    24.4. Every day

Other consumption

24. Do you have a summer cottage?
    24.1 No
    24.2 I use it in summer
    24.3 I use it throughout the year

25. How many people use the summer cottage regularly?
    25.1. No
    25.2 1-4 people
    25.3 5-10 people
    25.4 More than 10

26. How would you describe your shopping habits?
    26.1. My shopping is limited to absolute necessary purchases only.
    26.2. I estimate that my shopping habits are the same as an average Estonian.
    26.3. I like shopping and think I have more stuff than on average

27. How often do you buy second-hand clothes or refurbished electronics?
    27.1. Never
    27.2. Seldom
    27.3. I buy about 50% of my clothes and electronics second-hand or refurbished
    27.4. I buy most of my clothes and electronics second-hand or refurbished

28. How much money do you spend on pets every month?
    28.1. I don't have a pet
    24.2. 25 euros
    24.3. 50 euros
    24.4. 75 euros or more

Annex I: Table A2: Localized questions and options of the PSLifestyle tool for Germany

Questions and options			
Germany **Housing** 1. How many people live in your household? 1.1. 1 1.2. 2 1.3. 3 1.4. 4 1.5. 5 1.6. more than 5 2. What is the living area of your home? 2.1. Less than 20 m2 2.2. 20 - 50 m2 2.3. 51 - 80 m2 2.4. 81 -120 m2 2.5. 121 - 200 m2 2.6. More than 200 m2 3. What kind of electricity do you use? 3.1. Green electricity 3.2. Ordinary electricity 3.3. I don't know	4. What kind of house do you live in? 4.1. Block of flats 4.1.1. Not energetically refurbished house Before 1990 4.1.2. Energetically refurbished house 1990-2010 4.1.3. Low energy house After 2010 4.1.4. Passive house 4.2. Single-family house or semi-detached house 4.2.1 Not energetically refurbished house Before 1990 4.2.2. Energetically refurbished house 1990-2010 4.2.3. Low energy house After 2010 4.2.4. Passive house 4.3. Terraced house 4.3.1. Not energetically refurbished house Before 1990 4.3.2. Energetically refurbished house 1990-2010 4.3.3. Low energy house After 2010 4.3.4. Passive house 5. What is the primary heating method of your home? 5.1. Regular district heating 5.2. Green district heating, wood or pellets 5.3. Light fuel oil 5.4. Electricity 5.5. Natural gas 5.6. Ground-source heat pump or air-source heat pump	6. What is the room temperature in your home in winter? 6.1. Cool, about 19°C 6.2. Moderate, about 21°C 6.3. Warm, about 23°C 7. How much time per week do you spend having a shower? 7.1. About 30 minutes 7.2. About 60 minutes 7.3. About 120 minutes 8. How many times per week do you have a bath? 8.1 I never have a bath 8.2 I have a bath 1-2 times per week 8.3 I have a bath 3-4 times per week 8.4 More than 4 times per week **Transport and tourism** 9. How many kilometers per week do you typically drive by car? (or as a passenger) 9.1. I don't drive 9.2. Less than 50 km 9.3. Less than 100 km 9.4. 100-400 km 9.5. 400-600 km 9.6. More than 600 km 10. What does your car run on? 10.1. Petrol 10.2. Diesel 10.3. Gas or ethanol 10.4. Electricity 10.5. Hybrid	11. How many people usually travel with you in the car? 11.1. 4 or more people in addition to myself 11.2. 3 people in addition to myself 11.3. 2 people in addition to myself 11.4. 1 people in addition to myself 11.5. I drive on my own 12. How many kilometers per week do you travel by public transport? 12.1 I don't use public transport at all 12.2 Less than 50 km 12.3 Less than 100 km 12.4 100 - 400 km 12.5 More than 400 km 13. How many hours per year do you normally travel by plane? 13.1. I have not travelled by plane at all 13.2. Less than 5 hours 13.3. 5 - 15 hours 13.4. 15 - 30 hours 13.5. More than 30 hours 14. Have you compensated for the emissions from your flights with voluntary carbon offset payments? 14.1. Yes, for all my flights 14.2. Yes, for some of my flights 14.3 No

15. How many hours per year do you normally travel (for vacations) by bus (by train, or by ferry)?
    - 15.1. Less than 50 km
    - 15.2. Less than 100 km
    - 15.3 100-400 km
    - 15.4 400-600 km
    - 15.5 More than 600 km

16. How many times a week do you walk or cycle to work or go to school (instead of driving or using public transport)?
    - 16.1. Never
    - 16.2. 1 time a week
    - 16.3. 2-3 times per week
    - 16.4. 4-5 times per week

Food

17. What describes best your eating habits?
    - 17.1 I am not vegan nor vegetarian
    - 17.2. I don´t eat meat, but I do eat fish
    - 17.3. I am a vegetarian
    - 17.4. I am a vegan

18. How much do you eat compared with the other people at a meal?
    - 18.1. Less
    - 18.2. About the same amount
    - 18.3. More

19. How many kg of meat you consume in one week?
    - 19.1 0
    - 19.2 Less 500 grams/week
    - 19.3 500 grams to 1.5 kg per week
    - 19.4 More than 1.5 kg per week

20. How often do you eat cheese in one week?
    - 20.1 1-3 times per week
    - 20.2 4-6 times per week
    - 20.3 Everyday

21. How often do you have the following as part of your meal?
    - 21.1. pork, chicken, fish, eggs
        - 21.1.1. Never
        - 21.1.2. 1 - 3 times a week
        - 21.1.3. 4 - 7 times a week
        - 21.1.4. Several times a day
    - 21.2. other dairy products (such as milk, yoghurt, quark, cream, butter)
        - 21.2 Never
        - 21.2.2. 1 - 3 times a week
        - 21.4.3. 4 - 7 times a week
        - 21.4.4. Several times a day

22. How many portions (cup/mug/pint/glass) of coffee, tea, juice, beer or wine do you drink every day?
    - 22.1. None
    - 22.2. 1 portion every now and then
    - 22.3. Fewer than 3 portions a day
    - 22.4. 3-5 portions a day
    - 22.5. More than 5 portions a day

23. How often do you throw food away in a week?
    - 23.1. Never
    - 23.2. Less 500 grams/week
    - 23.3. 500 grams to 1.5kg per week
    - 23.4. More than 1.5 kg per week

Other consumption

24. How would you describe your shopping habits?
    - 24.1. My shopping is limited to absolute necessary purchases only.
    - 24.2. I estimate that my shopping habits are the same as an average
    - 24.3. I like shopping and think I have more stuff than on average.

25. How often do you buy second-hand clothes or refurbished electronics?
    - 25.1. Never
    - 25.2. Seldom
    - 25.3. I buy about 50% of my clothes and electronics second-hand or refurbished
    - 25.4. I buy most of my clothes and electronics second-hand or refurbished

26. How much money do you spend on pets every month?
    - 26.1. I don't have a pet
    - 26.2. less than 50 euros
    - 26.3. 50-100 euros
    - 26.4. 100-200 euros
    - 26.5 200 euros or more

Annex I: Table A3: Localized questions and options of the PSLifestyle tool for Greece

Questions and options			
Greece **Housing** 1. How many people live in your household? 1.1. 1 1.2. 2 1.3. 3 1.4. 4 1.5. 5 1.6. more than 5 2. What is the living area of your home? 2.1. Less than 20 m2 2.2. 20 - 50 m2 2.3. 51 - 80 m2 2.4. 81 -120 m2 2.5. 121 - 200 m2 2.6. More than 200 m2 3. What kind of house do you live in? 3.1. Block of flats 3.1.1. Old house with bad insulation and conventional boiler 3.1.2. Bad insulation, new heating 3.1.3. Good insulation, new heating 3.1.4 Great insulation, high efficiency system and temperature control 3.1.5 High tech house	3.2. Single-family house or semi-detached house 3.2.1. Old house with bad insulation and conventional boiler 3.2.2. Bad insulation, new heating 3.2.3. Good insulation, new heating 3.2.4 Great insulation, high efficiency system and temperature control 3.2.5 High tech house 3.3. Terraced house 3.3.1. Old house with bad insulation and conventional boiler 3.3.2. Bad insulation, new heating 3.3.3. Good insulation, new heating 3.3.4 Great insulation, high efficiency system and temperature control 3.3.5 High tech house 4. What is the primary heating method of your home? 4.1. District heating 4.2 Wood or pellets 4.3. Light fuel oil 4.4. Electricity 4.5. Natural gas 4.6. Ground-source heat pump or air-source heat pump	5. If you are heating your house, what is the room temperature you keep your home in winter? 5.1. Cool, about 19°C 5.2. Moderate, about 20°C 5.3. Warm, about 22°C 5.4 Very warm, over 23°C 6. If you are cooling your house, what is the room temperature you keep your home in summer? 6.1 Cool, about 21°C 6.2 Moderate, between 22°C and 23°C 6.3 Warm, between 24°C and 29°C 6.4 Very warm, above 29°C 7. How much time per week do you spend having a shower? 7.1. About 30 minutes 7.2. About 60 minutes 7.3. About 120 minutes **Transport and tourism** 8. How many kilometers per week do you typically drive by car? 8.1. 0 to 50 km 8.2. 50 to 100 km 8.3. 100 to 300 km 8.4. More than 300 km 9. What does your car run on? 9.1. Petrol 9.2. Diesel 9.3. Gas or ethanol 9.4. Electricity 9.5. Hybrid 9.6 Plug-in Hybrid	10. How many people usually travel with you in the car? 10.1. 4 or more people in addition to myself 10.2. 3 people in addition to myself 10.3. 2 people in addition to myself 10.4. 1 people in addition to myself 10.5. I drive on my own 11. How many kilometers per week do you travel by public transport? 11.1. I don't use public transport at all 11.2 Less than 50 km 11.2. Less than 100 km 11.3. 100 - 400 km 11.4. More than 400 km 12. How many kilometers per week do you typically drive by motorcycle (or other two-wheeler motor transport)? 12.1 0 to 50 km 12.2 50 to 100 km 12.3 100 to 300 km 12.4 More than 300 km 13. How many hours per year you normally travel by plane? 13.1. I have not travelled by plane at all 13.2. Less than 5 hours 13.3. 5 - 15 hours 13.4. 15 - 30 hours 13.5. More than 30 hours

14. How many return trips per year do you normally make by ferry?
    - 14.1. I have not travelled by ferry
    - 14.2. 1 - 4 trips
    - 14.3. 5 - 15 trips
    - 14.4. More than 15 trips

15. How many times a week do you walk or cycle to work or go to school (instead of driving or using public transport)?
    - 15.1 Never
    - 15.2 1 time a week
    - 15.3. 2-3 times per week
    - 15.4 4-5 times per week

Food

16. What describes best your eating habits?
    - 16.1 I am not vegan nor vegetarian
    - 16.2. I don´t eat meat, but I do eat fish
    - 16.3. I am a vegetarian
    - 16.4. I am a vegan

17. How many meals do you usually have per day?
    - 17.1 One
    - 17.2 Two
    - 17.3 Three
    - 17.4 Four
    - 17.5 More than 4

18. How often do you have the following as part of your meal?
    - 18.1. beef or cold cuts
        - 18.1.1. Never
        - 18.1.2. Rarely (less than 3 times per month)
        - 18.1.3. 1 - 3 times a week
        - 18.1.4. 4 - 7 times a week
        - 18.1.5. Several times a day
    - 18.2. pork, chicken, eggs
        - 18.2.1. Never
        - 18.2.2. Rarely (less than 3 times per month)
        - 18.2.3. 1 - 3 times a week
        - 18.2.4. 4 - 7 times a week
        - 18.2.5. Several times a day
    - 18.3. cheese
        - 18.3.1. Never
        - 18.3.2. Rarely (less than 3 times per month)
        - 18.3.3. 1 - 3 times a week
        - 18.3.4. 4 - 7 times a week
        - 18.3.5. Several times a day
    - 18.4. other dairy products (such as milk, sour milk, yoghurt, quark, cream, butter)
        - 18.4.1. Never
        - 18.4.2. Rarely (less than 3 times per month)
        - 18.4.3. 1 - 3 times a week
        - 18.4.4. 4 - 7 times a week
        - 18.4.5. Several times a day
    - 18.5. fish/seafood
        - 18.5.1. Never
        - 18.5.2. Rarely (less than 3 times per month)
        - 18.5.3. 1 - 3 times a week
        - 18.5.4. 4 - 7 times a week
        - 18.5.5. Several times a day

19. How many portions (cup/mug/pint/glass) of coffee, tea, juice, beer or wine do you drink every day?
    - 19.1. None
    - 19.2. 1 portion every now and then
    - 19.3. Fewer than 3 portions a day
    - 19.4. 3-5 portions a day
    - 19.5. More than 5 portions a day

20. How many meals per week you eat in or as take away from restaurants, cafeterias, canteens, or have delivered to you?
    - 20.1. 1 - 2 meals per week
    - 20.2. 3 - 5 meals per week
    - 20.3. More than 5 meals per week

21. How often do you throw food away?
    - 21.1. None
    - 21.2. 1 portion per week
    - 21.3. 2-4 portions per week
    - 21.4. More than 5 portions per week

Other consumption

22. How would you describe your shopping habits?
    - 22.1. My shopping is limited to absolute necessary purchases only.
    - 22.2. I estimate that my shopping habits are the same as an average Greek's.
    - 22.3. I like shopping and think I have more stuff than on average.

23. How often do you buy second-hand clothes or refurbished electronics?
    - 23.1. Never
    - 23.2. Seldom
    - 23.3. I buy about 50% of my clothes and electronics second-hand or refurbished
    - 23.4. I buy most of my clothes and electronics second-hand or refurbished

24. How much money do you spend on pets every month?
    - 24.1. I don't have a pet
    - 24.2. 50 euros
    - 24.3. 100 euros
    - 24.4. 200 euros or more

Annex I: Table A4: Localized questions and options of the PSLifestyle tool for Italy

Questions and options			
Italy **Housing** 1. How many people live in your household? 1.1. 1 1.2. 2 1.3. 3 1.4. 4 1.5. 5 1.6. more than 5 2. What is the living area of your home? 2.1. Less than 20 m2 2.2. 20 - 50 m2 2.3. 51 - 80 m2 2.4. 81 -120 m2 2.5. 121 - 200 m2 2.6. More than 200 m2 3. What kind of electricity do you use? 3.1. 100% electricity 3.2. Ordinary electricity 4. What is the energy rating of your home? 4.1 A 4.2 B-C-D 4.3 E-F 4.4 G 4.5 I don’t know	5. What kind of house do you live in? 5.1. Block of flats 5.1.1. Not energetically refurbished house 5.1.2. Energetically refurbished house 5.1.3. Low energy house 5.1.4 Passive house 5.2. Single-family house or semi-detached house 5.2.1. Not energetically refurbished house 5.2.2. Energetically refurbished house 5.2.3. Low energy house 5.2.4 Passive house 5.3. Terraced house 5.3.1. Not energetically refurbished house 5.3.2. Energetically refurbished house 5.3.3. Low energy house 5.3.4 Passive house 6. What is the primary heating method of your home? 6.1. Natural gas 6.2. Heat pump 6.3. LPG/Diesel 6.4. Woodchip/pellets	7. What is the room temperature in your home in winter? 7.1. Cool, about 19°C 7.2. Moderate, about 21°C 7.3. Warm, about 23°C 8. How much time per week do you spend having a shower? 8.1. About 30 minutes 8.2. About 60 minutes 8.3. About 120 minutes 9. How many times per week do you have a bath? 9.1 I never have a bath 9.2 I have a bath 1-2 times per week 9.3 3-4 times per week 9.4 More than 4 times **Transport and tourism** 10. How many kilometers per week do you typically drive? 10.1. I don't drive 10.2. Less than 100 km 10.3. 100 - 400 km 10.4. More than 400 km 11. What does your car run on? 11.1. Petrol 11.2. Diesel 11.3. Gas (LPG) or ethanol 11.4. Electricity 11.5. Hybrid 11.6 Methane	12. How many people usually travel with you in the car? 12.1. 4 or more people in addition to myself 12.2. 3 people in addition to myself 12.3. 2 people in addition to myself 12.4. 1 people in addition to myself 12.5. I drive on my own 13. How many kilometers per week do you travel by public transport? 13.1. I don’t use public transport at all 13.2. Less than 100 km 13.3. 100 - 400 km 13.4. More than 400 km 14. How many hours per year do you normally travel by plane? 14.1. I have not travelled by plane at all 14.2. Less than 5 hours 14.3. 5 - 15 hours 14.4. 15 - 30 hours 14.5. More than 30 hours

15. How many return trips per year do you normally make by ferry?
    - 15.1. I have not travelled by ferry
    - 15.2. 1 - 4 trips
    - 15.3. 5 - 15 trips
    - 15.4. More than 15 trips

16. How many times a week do you walk or cycle to work or go to school (instead of driving or using public transport)?
    - 16.1 Never
    - 16.2 1 time a week
    - 16.3 2-3 times per week
    - 16.4 4-5 times per week

Food

17. What describes best your eating habits?
    - 17.1 I am not vegan nor vegetarian
    - 17.2. I don´t eat meat, but I do eat fish
    - 17.3. I am a vegetarian
    - 17.4. I am a vegan

18. How much do you eat compared with the other people at a meal?
    - 18.1. Less
    - 18.2. About the same amount
    - 18.3. More

19. How often do you have the following as part of your meal?
    - 18.1. meat
        - 18.1.1. Never
        - 18.1.2. 1 - 3 times a week
        - 18.1.3. 4 - 7 times a week
        - 18.1.4. Several times a day
    - 18.2. pork, chicken, fish
        - 18.2.1. Never
        - 18.2.2. 1 - 3 times a week
        - 18.2.3. 4 - 7 times a week
        - 18.2.4. Several times a day
    - 18.3. hard cheese
        - 18.3.1. Never
        - 18.3.2. 1 - 3 times a week
        - 18.3.3. 4 - 7 times a week
        - 18.3.4. Several times a day
    - 18.4. eggs and dairy products (such as soft cheese, milk, yoghurt, cream, butter)
        - 18.4.1. Never
        - 18.4.2. 1 - 3 times a week
        - 18.4.3. 4 - 7 times a week
        - 18.4.4. Several times a day

20. How many portions (cup/mug) of coffee or tea do you drink every day?
    - 20.1. None
    - 20.2. 1 portion every now and then
    - 20.3. Fewer than 3 portions a day
    - 20.4. 3-5 portions a day
    - 20.5. More than 5 portions a day

21. How many portions (pint/glass) of beer or wine do you drink every day?
    - 21.1. None
    - 21.2. 1 portion every now and then
    - 21.3. Fewer than 3 portions a day
    - 21.4. 3-5 portions a day
    - 21.5. More than 5 portions a day

22. How many meals per week you eat in or as take away from restaurants, cafeterias, canteens, or have delivered to you?
    - 22.1. none
    - 22.2. 1 - 2 meals per week
    - 22.3. 3 - 5 meals per week
    - 22.4. More than 5 meals per week

23. How often do you throw food away?
    - 23.1. Never
    - 23.2. Seldom
    - 23.3. Every week
    - 23.4. Every day

Other consumption

24. How would you describe your shopping habits?
    - 22.1. My shopping is limited to absolute necessary purchases only.
    - 22.2. I estimate that my shopping habits are the same as an average Italian.
    - 22.3. I like shopping and think I have more stuff than on average.

25. How often do you buy second-hand clothes or refurbished electronics?
    - 23.1. Never
    - 23.2. Seldom
    - 23.3. I buy about 50% of my clothes and electronics second-hand or refurbished
    - 23.4. I buy most of my clothes and electronics second-hand or refurbished

26. How much money do you spend on pets every month?
    - 24.1. I don't have a pet
    - 24.2. 50 euros
    - 24.3. 100 euros
    - 24.4. 200 euros or more

Annex I: Table A5: Localized questions and options of the PSLifestyle tool for Portugal

Questions and options			
Portugal **Housing** 1. How many people live in your household? 1.1. 1 1.2. 2 1.3. 3 1.4. 4 1.5. 5 1.6. 6 or more 2. What is the living area of your home? 2.1. Less than 20 m2 2.2. 20 - 50 m2 2.3. 51 - 80 m2 2.4. 81 -120 m2 2.5. 121 - 200 m2 2.6. More than 200 m2 3. What kind of electricity do you use? 3.1. Electricity from the national grid 3.2. Self-produced electricity from renewables 3.3 I don't know	4. What kind of house do you live in? 4.1. Block of flats 4.1.1. Built before 1990 4.1.2. built 1990 - 2010 4.1.3. Built after 2010 4.2. Single-family house or semi-detached house 4.2.1. Built before 1990 4.2.2. built 1990 - 2010 4.2.3. Built after 2010 5. What is the primary heating method of your home? 5.1. Butane gas 5.2. Solar thermal energy 5.3. Domestic heating, ventilation and air conditioning (HVAC) 5.4. Electricity 5.5. Natural gas 5.6. Ground-source heat pump or air-source heat pump	6. What is the room temperature in your home in winter? 6.1. Cool, about 19°C 6.2. Moderate, about 21°C 6.3. Warm, about 23°C 7. How much time per week do you spend having a shower? 7.1. About 30 minutes 7.2. About 60 minutes 7.3. About 120 minutes 8. How many times per week do you have a bath? 8.1 I never have a bath 8.2 Once per week 8.3 2-3 times per week 8.4 more than 3 times per week **Transport and tourism** 9. How many kilometers per week do you typically drive? 9.1. I don't drive 9.2. Less than 100 km 9.3. 100 - 400 km 9.4 400-600 km 9.5. More than 600 km 10. What does your car run on? 10.1. Petrol 10.2. Diesel 10.3. Liquified petroleum gas (LPG) 10.4. Electricity 10.5. Hybrid	11. How many people usually travel with you in the car? 11.1. 4 or more people in addition to myself 11.2. 3 people in addition to myself 11.3. 2 people in addition to myself 11.4. 1 people in addition to myself 11.5. I drive on my own 12. How many kilometers per week do you travel by public transport? 12.1. I don't use public transport at all 12.2. Less than 100 km 12.3. 100 - 400 km 12.4. More than 400 km 13. How many hours per year you normally travel by plane? 13.1. I have not travelled by plane at all 13.2. Less than 5 hours 13.3. 5 - 15 hours 13.4. 15 - 30 hours 13.5. More than 30 hours

14. How many times a week do you walk or cycle to work or go to school (instead of driving or using public transport)?
    - 14.1. Never
    - 14.2. 1 time a week
    - 14.3. 2-3 times per week
    - 14.4. 4-5 times per week

Food

15. What describes best your eating habits?
    - 15.1 I am not vegan nor vegetarian
    - 15.2. I don´t eat meat, but I do eat fish
    - 15.3. I am a vegetarian
    - 15.4. I am a vegan

16. How much do you eat compared with the other people at a meal?
    - 16.1. Less
    - 16.2. About the same amount
    - 16.3. More

17. How often do you have the following as part of your meal?
    - 17.1. beef or cold cuts
        - 17.1.1. Never
        - 17.1.2. 1 - 3 times a week
        - 17.1.3. 4 - 7 times a week
        - 17.1.4. Several times a day
    - 17.2. pork, chicken, fish, eggs
        - 17.2.1. Never
        - 17.2.2. 1 - 3 times a week
        - 17.2.3. 4 - 7 times a week
        - 17.2.4. Several times a day
    - 17.3. cheese
        - 17.3.1. Never
        - 17.3.2. 1 - 3 times a week
        - 17.3.3. 4 - 7 times a week
        - 17.3.4. Several times a day
    - 17.4. other dairy products (such as milk, yoghurt, quark, cream, butter)
        - 17.4.1. Never
        - 17.4.2. 1 - 3 times a week
        - 17.4.3. 4 - 7 times a week
        - 17.4.4. Several times a day

18. How many portions (cup/mug) of coffee or tea do you drink every day?
    - 18.1. None
    - 18.2. 1 portion every now and then
    - 18.3. Fewer than 3 portions a day
    - 18.4. 3-5 portions a day
    - 18.5. More than 5 portions a day

19. How many portions (pint/glass) of beer or wine do you drink every day?
    - 19.1. None
    - 19.2. 1 portion every now and then
    - 19.3. Fewer than 3 portions a day
    - 19.4. 3-5 portions a day
    - 19.5. More than 5 portions a day

20. How many meals per week you eat in or as take away from restaurants, cafeterias, canteens, or have delivered to you?
    - 20.1. None
    - 20.2. 1 - 2 meals per week
    - 20.3. 3 - 5 meals per week
    - 20.4. More than 5 meals per week

21. How often do you throw food away?
    - 21.1. Never
    - 21.2. Seldom
    - 21.3. Every week
    - 21.4. Every day

Other consumption

22. How would you describe your shopping habits?
    - 22.1. My shopping is limited to absolute necessary purchases only.
    - 22.2. I estimate that my shopping habits are the same as an average Portuguese.
    - 22.3. I like shopping and think I have moe stuff than on average.

23. How often do you buy second-hand clothes or refurbished electronics?
    - 23.1. Never
    - 23.2. Seldom
    - 23.3. I buy about 50% of my clothes and electronics second-hand or refurbished
    - 23.4. I buy most of my clothes and electronics second-hand or refurbished

24. How much money do you spend on pets every month?
    - 24.1. I don't have a pet
    - 24.2. 30 euros
    - 24.3. 50 euros
    - 24.4 100 euros
    - 24.5. 200 euros or more

Annex I: Table A6: Localized questions and options of the PSLifestyle tool for Slovenia

Questions and options			
Slovenia **Housing** 1. How many people live in your household? 1.1. 1 1.2. 2 1.3. 3 1.4. 4 1.5. 5 1.6. more than 5 2. What is the living area of your home? 2.1. Less than 20 m2 2.2. 20 - 50 m2 2.3. 51 - 80 m2 2.4. 81 -120 m2 2.5. 121 - 200 m2 2.6. More than 200 m2 3. What kind of electricity do you use? 3.1. Green or Carbon-neutral electricity (including nuclear) from a provider 3.2. Ordinary electricity from a provider 3.3. Self-consumption (PV - solar panels) 3.4 I don't know	4. What kind of house do you live in? 4.1. Block of flats, apartment building, students dorm, retirement home etc. 4.1.1. Yes, it has been energetically refurbished 4.1.2. No, it has been energetically refurbished 4.2. Single-family house or semi-detached house 4.2.1. Yes, it has been energetically refurbished 4.2.2. No, it has been energetically refurbished 4.3. Terraced house 4.3.1. Yes, it has been energetically refurbished 4.3.2. No, it has been energetically refurbished 5. What is the primary heating method of your home? 5.1. Regular district heating 5.2. Green district heating, wood or pellets 5.3. Own house heating: Light fuel oil 5.4. Own house heating: Electricity 5.5. Own house heating: Natural gas 5.6. Ground-source heat pump or air-source heat pump	6. What is your postal code? 7. What is the room temperature in your home in winter? 7.1. Cool, about 19°C 7.2. Moderate, about 21°C 7.3. Warm, about 23°C 7.4 Hot, 25°C and above 8. How much time per week do you spend having a shower? 8.1. About 30 minutes 8.2. About 60 minutes 8.3. About 120 minutes 9. How much time per week do you spend having a bath? 9.1 I never have a bath 9.2 I take a bath 1-2 times per week 9.3 3-4 times 9.4 More than 4 times **Transport and tourism** 10. How many kilometers per week do you typically drive? 10.1. I don't drive 10.2. Less than 5000 km 10.3. 5000 - 20000 km 10.4. 20000-30000 km 10.5 More than 30000km 11. What does your car run on? 11.1. Petrol 11.2. Diesel 11.3. Gas or ethanol 11.4. Electricity 11.5. Hybrid	12. How many people usually travel with you in the car? 12.1. 4 or more people in addition to myself 12.2. 3 people in addition to myself 12.3. 2 people in addition to myself 12.4. 1 people in addition to myself 12.5. I drive on my own 13. How many kilometers per week do you travel by public transport? 13.1. I don't use public transport at all 13.2. Less than 50 km 13.3. 50 - 100 km 13.4 100-300 km 13.5. More than 300 km 14. How many hours per year do you normally travel by plane? 13.1. I have not travelled by plane at all 13.2. Less than 5 hours 13.3. 5 - 15 hours 13.4. 15 - 30 hours 13.5. More than 30 hours 15. Have you compensated for the emissions from your flights with voluntary carbon offset payments? 15.1. Every time 15.2. Occasionally 15.3 Never

16. How many return trips per year do you normally make by ferry?
    - 16.1. I have not travelled by ferry
    - 16.2. 1 - 4 trips
    - 16.3. 5 - 15 trips
    - 16.4. More than 15 trips

17. How many times a week do you walk or cycle instead of driving or using public transport?
    - 17.1 Never
    - 17.2 1 time a week
    - 17.3 2-3 times per week
    - 17.4 4 or more times per week

Food

18. What describes best your eating habits?
    - 18.1 I eat everything
    - 18.2. I don´t eat meat, but I do eat fish
    - 18.3. I am a vegetarian
    - 18.4. I am a vegan

19. How much do you eat compared with the other people at a meal?
    - 19.1. Less
    - 19.2. About the same amount
    - 19.3. More

20. How often do you have the following as part of your meal?
    - 20.1. beef or cold cuts
        - 20.1.1. Never
        - 20.1.2. 1 - 3 times a week
        - 20.1.3. 4 - 7 times a week
        - 20.1.4. Several times a day
    - 20.1.5 1-3 times a month
    - 20.2. pork, chicken, fish, eggs
        - 20.2.1. Never
        - 20.2.2. 1 - 3 times a week
        - 20.2.3. 4 - 7 times a week
        - 20.2.4. Several times a day
    - 20.2.5 1-3 times a month
    - 20.3. cheese
        - 20.3.1. Never
        - 20.3.2. 1 - 3 times a week
        - 20.3.3. 4 - 7 times a week
        - 20.3.4. Several times a day
    - 20.4. other dairy products (such as milk, yoghurt, quark, cream, butter)
        - 20.4.1. Never
        - 20.4.2. 1 - 3 times a week
        - 20.4.3. 4 - 7 times a week
        - 20.4.4. Several times a day

21. How many portions (cup/mug) of coffee, tea or juice do you drink every day?
    - 21.1. None
    - 21.2. 1 portion every now and then
    - 21.3. Fewer than 3 portions a day
    - 21.4. 3-5 portions a day
    - 21.5. More than 5 portions a day

22. How many portions (pint/glass) of beer or wine do you drink every day?
    - 22.1. None
    - 22.2. 1 portion every now and then
    - 22.3. Fewer than 3 portions a day
    - 22.4. 3-5 portions a day
    - 22.5. More than 5 portions a day

23. How many meals per week you eat in restaurants, take away or in a canteen at work?
    - 23.1. None
    - 23.2. 1 - 2 meals per week
    - 23.3. 3 - 5 meals per week
    - 23.4. More than 5 meals per week

24. How often do you throw food away?
    - 24.1. Never
    - 24.2. Seldom
    - 24.3. Every week
    - 24.4. Every day

Other consumption

25. How would you describe your shopping habits?
    - 25.1. My shopping is limited to absolute necessary purchases only.
    - 25.2. I buy less than an average Slovenian
    - 25.3. I estimate that my shopping habits are the same as an average Slovenian.
    - 25.4. I like shopping and think I buy more stuff than on average.

26. How often do you buy second-hand clothes or refurbished electronics?
    - 26.1. Never
    - 26.2. Seldom
    - 26.3. I buy about 50% of my clothes and electronics second-hand or refurbished
    - 26.4. I buy most of my clothes and electronics second-hand or refurbished

27. Do you have a summer cottage?
    - 27.1 No
    - 27.2 I use it in summer
    - 27.3 I use it throughout the year

28. How many people use the summer cottage regularly?
    - 28.1 1-4 people
    - 28.2 5-10 people
    - 28.3 More than 10 people

29. How much money do you spend on pets every month?
    - 29.1. I don't have a pet
    - 29.2. 50 euros
    - 29.3. 100 euros
    - 29.4. 200 euros or more

Annex I: Table A7: Localized questions and options of the PSLifestyle tool for Turkey

Questions and options			
Turkey **Housing** 1. How many people live in your household? 1.1. 1 1.2. 2 1.3. 3 1.4. 4 1.5. 5 1.6. more than 5 2. How many rooms does your home have? 2.1. 2 2.2. 3 2.3. 4 2.4. More than 4 3. What kind of electricity do you use? 3.1. Solar panel 3.2. Ordinary electricity 3.3 I don't know	4. What kind of house do you live in? 4.1. Block of flats 4.1.1. Built before 1990 4.1.2. Built 1990 – 2007 4.1.3. Built 2007-2019 4.1.4. Built after 2019 4.2. Single-family house or semi-detached house 4.2.1. Built before 1990 4.2.2. Built 1990 – 2007 4.2.3. Built 2007-2019 4.2.4. Built after 2019 5. What is the primary heating method of your home? 5.1. Coal 5.2. Wood 5.3. Fuel oil 5.4. Electricity 5.5. Natural gas 5.6. Geothermal	6. What is the room temperature in your home in winter? 6.1. Cool, about 19°C 6.2. Moderate, about 21°C 6.3. Warm, about 23°C 7. How much time per week do you spend having a shower? 7.1. About 15 minutes 7.2. About 30 minutes 7.3. More than 30 minutes **Transport and tourism** 8. How many kilometers per week do you typically drive? 8.1. I don't drive 8.2. Less than 100 km 8.3. 100-400 km 8.4 400-600 km 8.5. More than 600 km 9. What does your car run on? 9.1. Petrol 9.2. Diesel 9.3. Gas (LPG) 9.4. Hybrid	10. How many people usually travel with you in the car? 10.1. 4 or more people in addition to myself 10.2. 3 people in addition to myself 10.3. 2 people in addition to myself 10.4. 1 people in addition to myself 10.5. I drive on my own 11. How many kilometers per week do you travel by public transport? 11.1. I don't use public transport at all 11.2. Less than 100 km 11.3. 100 - 400 km 11.4. More than 400 km 12. How many hours per year you normally travel by plane? 12.1. I have not travelled by plane at all 12.2. Less than 5 hours 12.3. 5 - 15 hours 12.4. 15 - 30 hours 12.5. More than 30 hours 13. How many intercity trips per year do you normally make for touristic purposes by bus or train? 13.1. 1-3 trips 13.2. 4-10 trips 13.3 more than 10 trips

14. How many times a week do you walk or cycle to work or go to school (instead of driving or using public transport)?
    - 14.1. Never
    - 14.2. 1 time a week
    - 14.3. 2-3 times per week
    - 14.4. 4-5 times per week

Food

15. What describes best your eating habits?
    - 15.1 I am not vegan nor vegetarian
    - 15.2. I don´t eat meat, but I do eat fish
    - 15.3. I am a vegetarian
    - 15.4. I am a vegan

16. How many meals do you eat on a regular day?
    - 16.1. 1
    - 16.2. 2
    - 16.3. 3 or more

17. How many kg of meat you consume in one month?
    - 17.1 0
    - 17.2 1-4 kg/month
    - 17.3 5-10 kg/month
    - 17.4 more than 10 kg/month

18. How often do you have the following as part of your meal?
    - 18.1. pork, chicken, fish, eggs
        - 18.1.1. Never
        - 18.1.2. 1 - 3 times a week
        - 18.1.3. 4 - 7 times a week
        - 18.1.4. Several times a day
    - 18.2. cheese
        - 18.2.1. 1 - 3 times a week
        - 18.2.2. 4 - 6 times a week
        - 18.2.3. Everyday
    - 18.3. other dairy products (such as milk, sour milk, yoghurt, cream, butter)
        - 18.3.1. Never
        - 18.3.2. 1 - 3 times a week
        - 18.3.3. 4 - 7 times a week
        - 18.3.4. Several times a day

19. How many portions (cups or glasses) of coffee, tea or juice do you drink every day?
    - 19.1. Fewer than 3 portions a day
    - 19.2. 4-6 portions a day
    - 19.3 6-10 portions a day
    - 19.4. More than 10 portions a day

20. How many glasses of beer, raki or wine do you drink per week?
    - 20.1 Never
    - 20.2 Fewer than 3 glasses per week
    - 20.3 3 to 6 glasses per week
    - 20.4 More than 6 glasses per week

21. How many meals per week you eat in or as take away from restaurants, cafeterias, canteens, or have delivered to you?
    - 21.1. None
    - 21.2. 1 - 2 meals per week
    - 21.3. 3 - 5 meals per week
    - 21.4. More than 5 meals per week

22. How often do you throw food away?
    - 22.1. Never
    - 22.2. Seldom
    - 22.3. Every week
    - 22.4. Every day

Other consumption

23. How would you describe your shopping habits?
    - 23.1. My shopping is limited to absolute necessary purchases only.
    - 23.2. I estimate that my shopping habits are the same as an average Turkish.
    - 23.3. I like shopping and think I have more stuff than on average.

24. How often do you buy second-hand clothes or refurbished electronics?
    - 24.1. Never
    - 24.2. Seldom
    - 24.3. I buy about 50% of my clothes and electronics second-hand or refurbished
    - 24.4. I buy most of my clothes and electronics second-hand or refurbished

25. How many days a year do you stay in a luxury hotel (4-5 stars) for vacation or for business purposes?
    - 25.1 Never
    - 25.2 Less than 1 week per year
    - 25.3 10-20 days per year
    - 25.4 More than 20 days per year

26. How much money do you spend on pets every month?
    - 26.1. I don't have a pet
    - 26.2. 50 euros
    - 26.3. 100 euros
    - 26.4. 200 euros or more

27. Do you recycle your waste (plastic, metal, glass, paper and cardboard)?
    - 27.1 No
    - 27.2 Yes

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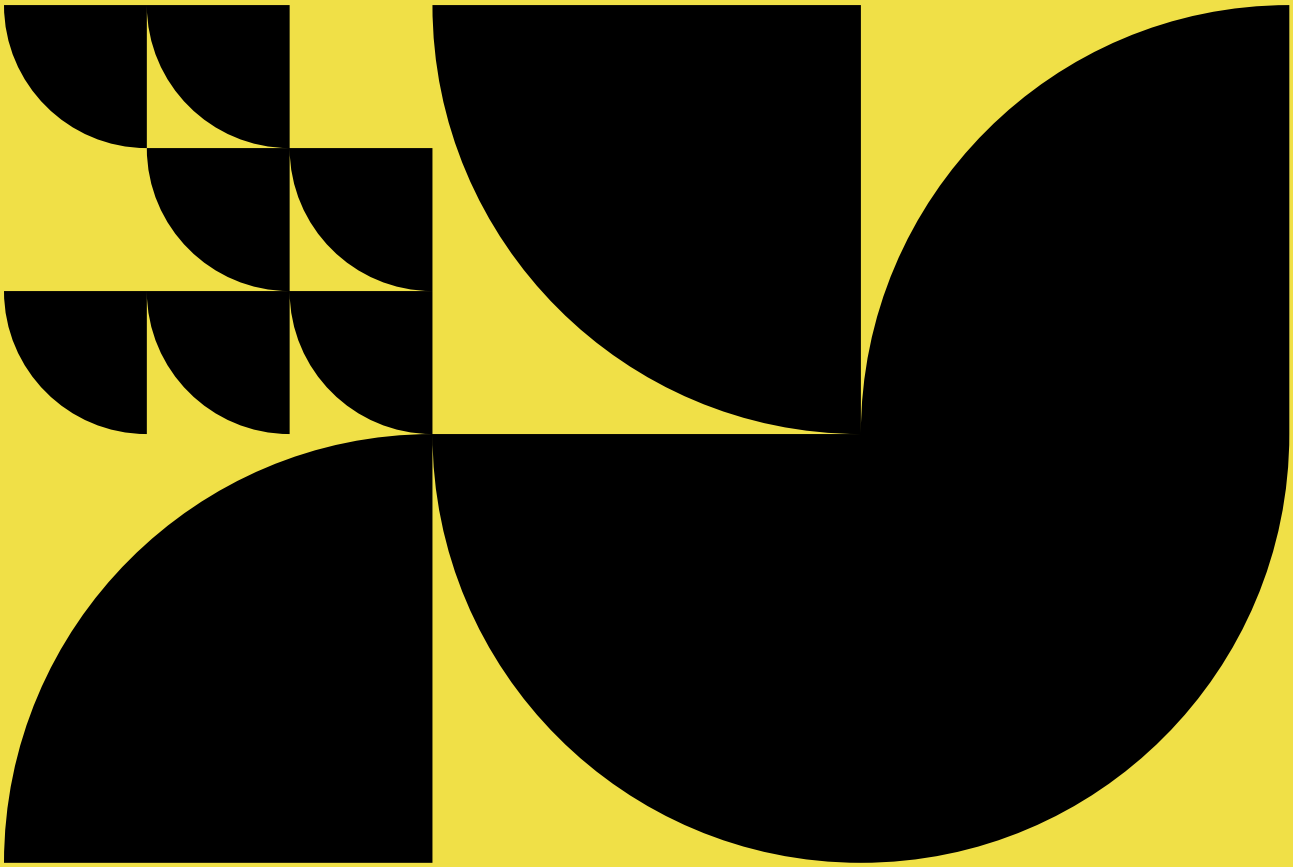

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