



# From pioneering sufficiency lifestyles to a sufficiency society

Fundamental decarbonisation  
through sufficiency by lifestyle changes

## **FULFILL**

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# Project Partners

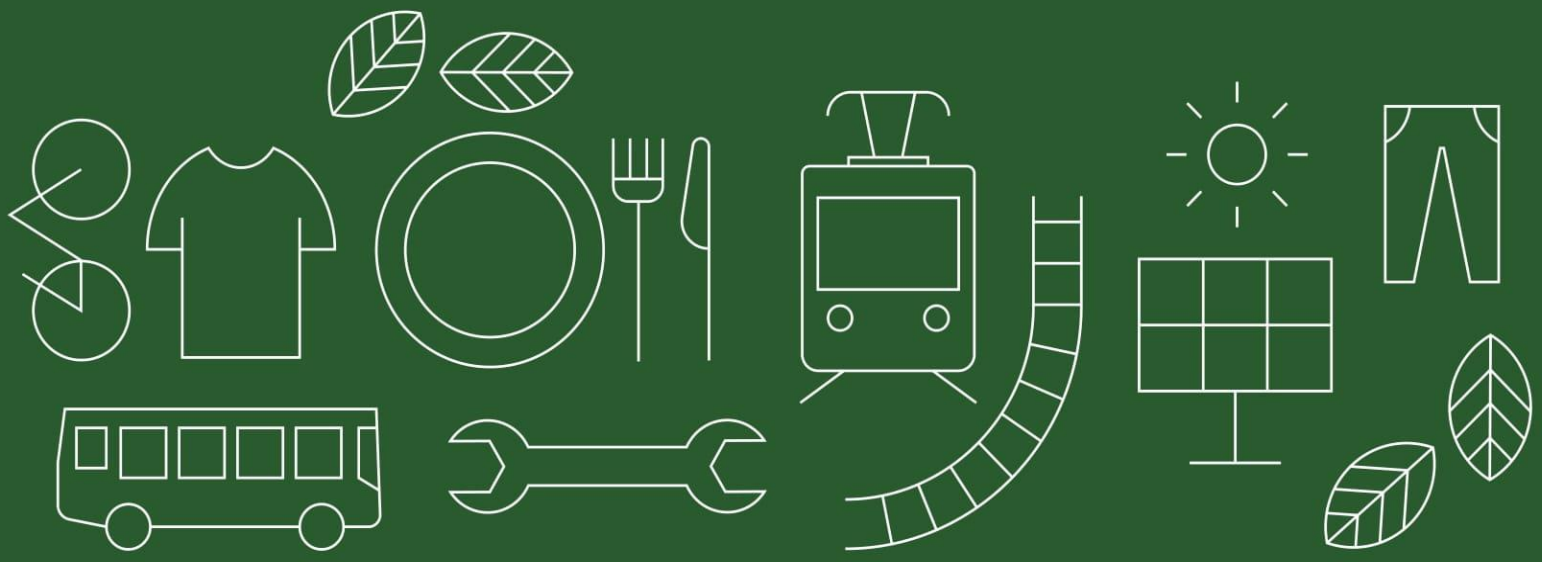
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## List of Abbreviations

EU	European Union
NDC	Nationally Determined Contributions
SSH	Social Sciences and Humanities
MS	Microsoft

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## Abstract / Summary

This part of the work focuses on upscaling, and on the macro-analysis of structural variables and conditions behind the diffusion of sufficient lifestyles. To that end, we analyse the data collected in WP3 and in WP4 through a macro level perspective to identify and understand the structural drivers and social determinants that are at play in the diffusion processes of sufficient lifestyles and in the transformation of social norms and values in society.

A comparative analysis is carried out between the six countries covered in WP3, so as to understand whether enablers and barriers are different depending on country (effects of cultural and national context). To that end, we investigate the macro frameworks and national contexts regarding sufficiency in each country. We first explore the different definitions of sufficiency as a concept in the countries covered. We then present the national and cultural specificities with regard to lifestyles and energy consumption, based on data and sources provided by the national partners. We then address the situation of the 2022-2023 winter regarding the energy crisis, especially with regard to the increase of energy prices and the policies implemented to mitigate them. Indeed, while not being in the proposal, the very peculiar situation in which the European countries were during that winter could not be overlooked.

Then, an econometric analysis is conducted on the five European countries, based on quantitative data collected during T3.1. (the data from India was not ready for analysis yet at the moment of this task). Using multinomial models, we investigate the determinants of sufficient lifestyle in each country, taking into consideration social, economic and demographic characteristics (gender, age, occupational status, education, income, indicators of economic deprivation), but also place-related variables (location and type of housing), and attitudes (sufficiency orientation, environmental identity, policy support). We analyse the main determinants of the membership to each of the five groups determined in T3.1., based on the carbon footprint calculation and wellbeing index: the very sufficient group, the sufficient, the low carbon footprint and low wellbeing group, the average carbon footprint group, and the high carbon footprint group (except for France, where the wellbeing index was not operational due to an error in the translation process of the question, and thus where groups are based solely on the carbon footprint data). We then conduct cross-national analysis on the main variables: gender, affluence, age, education, housing type, and environmental awareness, so as to highlight the differences and commonalities between countries.

The third part of the report is dedicated to the meso-level. We build on data and analysis performed in WP4 and provided by the WP4 leaders to expose the mesosocial determinants of sufficient lifestyles. We first present the main drivers and barriers of sufficiency to be found at the local level, derived from the analysis of the relationships between sufficiency initiatives and municipalities. We then present the effects of initiatives on sufficiency.

The fourth part of the report focuses on the micro-level determinants of sufficiency and on the diffusion of innovation processes in energy sufficiency. In this section, we confront theories of innovation to the socio-anthropological fieldwork data collected during T3.2., to analyse how the narratives of participants in sufficiency initiatives about their adoption of new practices can inform those theories. We investigate the strategies and factors influencing the adoption of new behaviours. We then explore the inner complexity of lifestyles and the differing levels of engagement that can be found at the individual level among the four sectors covered (housing, nutrition, mobility, miscellaneous consumption), highlighting the fact that there are diverse degrees and diverse ways to be sufficient, rather than "a sufficient lifestyle". Finally, we explore the levers and barriers to the diffusion of sufficient lifestyles, as derived from fieldwork data.



## Introduction and Overview

### Purpose of this Document

This part of the work focuses on upscaling, and on the macro-analysis of structural variables and conditions behind the diffusion of sufficient lifestyles.

The diffusion of these lifestyles will be analyzed according to contextual and structural factors as well as through biographical analysis, which will lead to the identification of enablers and barriers. As outlined in previous deliverables (Pagliano & Erba, 2022; Tröger et al., 2022), within the scope of FULFILL, sufficiency is defined as *creating the social, infrastructural, and regulatory conditions for changing individual and collective lifestyles in a way that reduces energy demand and greenhouse gas emissions to an extent that they are within planetary boundaries and simultaneously contributes to societal well-being.*

The overarching aim of work package (WP) 5 is to identify and analyse the structural drivers in the diffusion of lifestyle changes towards deep social transformation at the macro level. To that purpose, it combines theoretical foundations of sufficient lifestyles defined in WP2, social science and humanities analysis of data collected in previous SSH tasks (WP3 and WP4), analysis of key sufficiency policies across the different European countries (T5.2) in order to achieve the quantification of sufficiency in decarbonization pathways through the definition of key sufficiency hypothesis (T5.3).

In this task, a cross-country and cross-level analysis is achieved to analyse the empirical data collected at the micro (WP3) and meso (WP4) level in light of structural conditions identified at the macro level to facilitate the diffusion of sufficient lifestyles.

This will be achieved through:

- Analysis of the data collected in T3.2. (socio-anthropological fieldwork with intentional communities and panel respondents, see D3.2.) through a macro perspective to understand the structural variables behind the diffusion of sufficient lifestyles (referring to the innovation adoption theory);
- Analysis of the data collected in T3.1. (social survey) to identify social determinants that can play an important role in the emergence of sufficient lifestyles;
- Analysis of the data collected in WP4 (survey with intentional communities) to identify meso-level
- Identification of the differences in the underlying upscaling mechanisms between the countries selected.

### Project Summary

The project FULFILL takes up the concept of sufficiency to study the contribution of lifestyle changes and citizen engagement in decarbonizing Europe and fulfilling the goals of the Paris Agreement. FULFILL understands the sufficiency principle as creating the social, infrastructural, and regulatory conditions for changing individual and collective lifestyles in a way that reduces energy demand and greenhouse gas emissions to an extent that they are within planetary boundaries, and simultaneously contributes to societal well-being. The choice of the sufficiency principle is justified by the increasing discussion around it underlining it as a potentially powerful opportunity to actually achieve progress in climate change mitigation. Furthermore, it enables us to go beyond strategies that focus on single behaviors or certain domains and instead to look into lifestyles in the socio-technical transition as a whole. The critical and systemic application of the sufficiency principle to lifestyle changes and the assessment of its potential contributions to decarbonisation as well as its further intended or unintended consequences are therefore at the heart of this project. The sufficiency principle and sufficient lifestyles lie at the heart of FULFILL, and thus constitute the guiding principle of all work packages and deliverables.



## Project Aim and Objectives

To achieve this overarching project aim, FULFILL has the following objectives:

- Characterise the concept of lifestyle change based on the current literature and extend this characterisation by combining it with the sufficiency concept.
- Develop a measurable and quantifiable definition of sufficiency to make it applicable as a concept to study lifestyle changes in relation to decarbonization strategies.
- Generate a multidisciplinary systemic research approach that integrates micro-, meso-, and macro-level perspectives on lifestyle changes building on latest achievements from research into social science and humanities (SSH), i.e., psychological, sociological, economic, and political sciences, for the empirical work as well as Prospective Studies, i.e., techno-economic energy and climate research.
- Study lifestyle change mechanisms empirically through SSH research methods on the micro- (individual, household) and the meso-level (community, municipal)
- Achieve an in-depth analysis of existing and potential sufficiency lifestyles, their intended and unintended consequences (incl. rebound and spillover effects), enablers and barriers (incl. incentives and existing structures) as well as impacts (incl. on health and gender) on the micro level across diverse cultural, political, and economic conditions in Europe and in comparison to India as a country with a wide range of economic conditions and lifestyles, an history which encompasses simple-living movements, and a large potential growth of emissions.
- Assess the dynamics of lifestyle change mechanisms towards sufficiency on the meso-level by looking into current activities of municipalities, selected intentional communities and initiatives as well as analyzing their level of success and persisting limitations in contributing to decarbonisation.
- Integrate the findings from the micro and meso-level into a macro, i.e., national and European, level assessment of the systemic implications of sufficiency lifestyles and explore potential pathways for the further diffusion of promising sufficiency lifestyles.
- Implement a qualitative and quantitative assessment of the systemic impact of sufficiency lifestyles which in addition to a contribution to decarbonisation and economic impacts includes the analysis of further intended and unintended consequences (incl. rebound and spillover effects), enablers and barriers (incl. incentives and existing structures) as well as impacts (incl. on health and gender).
- Combine the research findings with citizen science activities to develop sound and valid policy recommendations contributing to the development of promising pathways towards lifestyle
- Generate findings that are relevant to the preparation of countries and the EU's next NDCs and NDC updates to be submitted in 2025 and validate and disseminate these findings to the relevant stakeholders and institutions for exploitation.
- Consider the relevance and potential impacts of sufficiency lifestyles beyond the EU.



# 1 Theoretical and methodological approaches

## 1.1 Theoretical framework and research questions

Task 5.1 which this deliverable reports on aims at analysing the data collected in WP3 and in WP4 through a macro level perspective to identify and understand the structural drivers and social determinants that are at play in the diffusion processes of sufficient lifestyles and in the transformation of social norms and values in society. Based on the findings of WP2, WP3 and WP4 and on the multi-level perspective (Geels 2005), we investigate how micro, meso and macro determinants of sufficiency interact in a cross-country perspective (see figure below, reproduced from deliverable 2.3, p. 18).

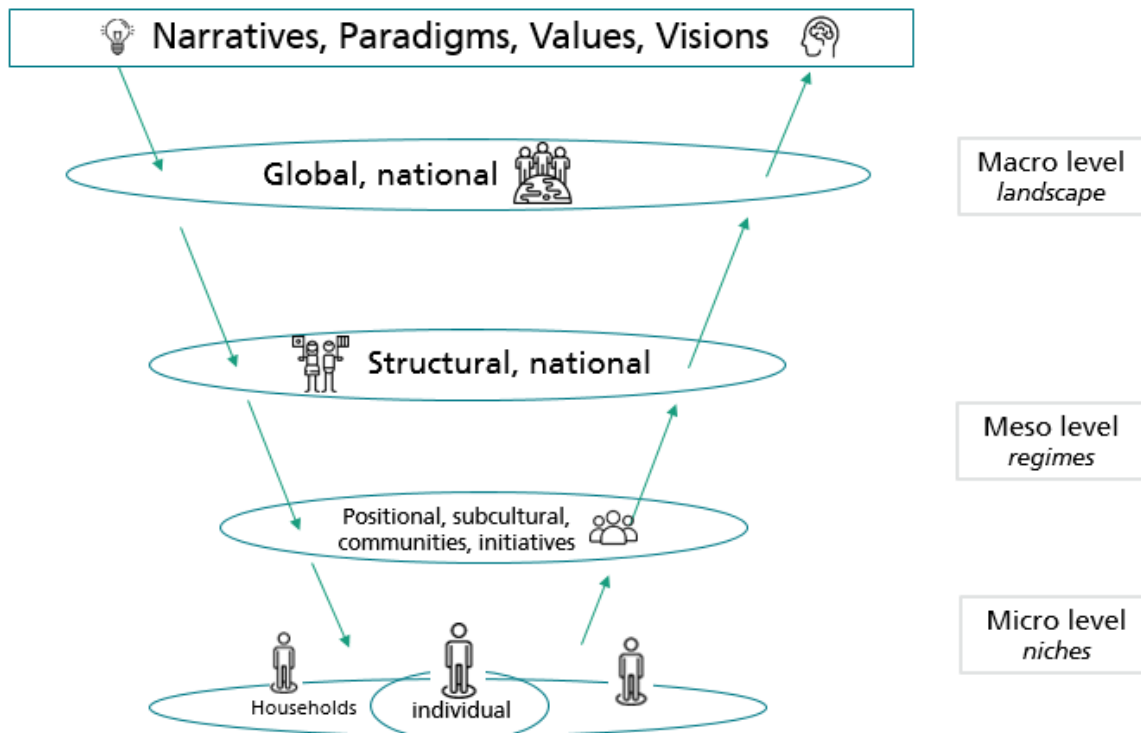


Figure 1. Overarching framework for lifestyle analyses on different levels in the FULFILL project

The theoretical frameworks we build upon thus varies in the different sections of the deliverable, depending on their focus on the micro, meso or macro-level.

At the macro-level, a comparative analysis is performed to explore the effects of cultural and national contexts, both at the level of practices (lifestyles and patterns of consumption), and at the level of infrastructures (material, through the trends in energy consumption, and political through the analysis of national policies regarding sufficiency. To that extent, we will first present in detail the national contexts in each country and the main differences that emerge from comparison, in order to understand to what extent path dependence with regard to historical events (Mahoney and Schensul 2006) and energy cultures (Stephenson et al. 2010), institutional lock-in effects (Flipo et al. 2021) and/or political orientations can influence the diffusion of sufficient lifestyles in the five European countries and India.

The second approach used to investigate the macro-level is the issue of "social frameworks", that are investigated through the thorough analysis of social determinants of sufficient lifestyles, based on the data collected in T3.1. Much work suggests that the contribution to the overall carbon footprint within a country is very uneven across social groups. As one of the aims



of WP5 is to compare sufficiency policies (5.2) and to quantify the potential of sufficiency (5.3), one of the questions that immediately arises is that of the division and consistency of social groups from the point of view of sufficiency. In line with the results displayed in of D3.2., we will focus in particular on the relationships between sufficient lifestyles and the gender dimension in all five countries<sup>1</sup>.

A third level of analysis focuses on the meso-level determinants of sufficient lifestyles, based on the data collected in WP4. The research question we try to address in this part of the work is that of the importance of local contexts and local levers (e.g., local initiatives, municipalities) with regard to the objective of upscaling sufficient lifestyles.

Finally, a fourth section focuses on the analysis of socio-anthropological data gathered in T3.2. to analyse the potential of upscaling of sufficiency-oriented practices as defined in D3.2. through the lens of the diffusion of innovation theories. The theory of the diffusion of innovations applies to the initiatives studied and enables us to improve our understanding on how sufficiency initiatives diffuse among individuals, and how they could be more widely diffused. It also offers different frameworks to distinguish between categories of adopters that will complement the sociodemographic approach adopted in the second section.

Overall, the analysis will seek to determine how far social groups - and associated lifestyles - are consistent and how successful sufficiency policies need to consider heterogeneity within lifestyles and institutional conditions (cultural or political) to reinforce a general increase of sufficiency practices among European countries.

## 1.2 Methodology

The methodologies used in this deliverable correspond with the different steps of the research project.

The section 2 relies on both desk research from partners and data from in-depth interviews with respondents selected in two different categories: highly sufficient lifestyles and "average" lifestyles in different income groups, with the addition of a cluster of underprivileged respondents in India<sup>2</sup>.

The section 3 relies on econometric analysis based on survey data with a panel of representative individuals in the five European countries<sup>3</sup>.

The section 4 was carried out in two steps. In the first step a survey among 64 sufficiency initiatives from 5 EU countries was conducted. The second step have been national workshops with local initiatives but also employees from municipalities<sup>4</sup>.

The section 5 relies on data from in-depth interviews gathered during T3.2.

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<sup>1</sup> India is not included in this part of the work because of the data not being available yet.

<sup>2</sup> Details of the data collection and methodology for T3.2. are to be found in the deliverable 3.2.

<sup>3</sup> Details of the data collection and methodology for T3.1. are to be found in the deliverable 3.1. and are further developed in section 3.

<sup>4</sup> Details of the data collection and methodology for T4.2. and T4.3. are to be found in the deliverables 4.2. and 4.3. respectively.



## 2 Macro frameworks and national contexts regarding sufficiency

In this section, we investigate the macrolevel cultural, political and institutional frameworks surrounding energy sufficiency in the six countries. We first investigate the notion of sufficiency in each country; then, we explore the national and cultural specificities regarding lifestyles, energy cultures, and practices; and finally, we present the national contexts with regard to the energy crisis. In a fourth sub-section, we summarise the main differences between countries.

### 2.1 Definition of sufficiency as a concept in the different countries

In this section, we base our analysis on each partner's desk research to determine the sources and translation of the word 'sufficiency' in their own country, as well as to clarify how the word was used in their political and social context, with respect to the energy transition.

In parallel, we investigate how respondents from the socio-anthropological fieldwork we conducted during task 3.2., both in the intentional communities and in the panel, have reflected on the concept during the in-depth interviews. Depending on the country and at times on the respondent, there are different definitions for 'sufficiency', which are not always related to the Energy Transition, but there is a common perception of 'not needing more'. The national contexts of the use of the word in recent years reflect the changing in the energy supply and environmental issues.

#### 2.1.1 Denmark

In Denmark, the word '*sufficiency*', or its direct translation *tilstrækkelighed*, is not used in the sense intended in this project, aside from academic circles working specifically on energy sufficiency, where the English term is used. The word *tilstrækkelig* is used to describe that there is enough of something (e.g., "Der er tilstrækkeligt med maling til at dække væggen": "There is enough paint to cover the wall"). Historically, words such as *sparsommelig* or *nøjsom* meaning 'frugal', have been used to describe a lifestyle in which people minimize their consumption, ensuring that they do not overconsume and simply get by with less<sup>5</sup>. Today, however, the word 'sustainability', translated directly into *bæredygtighed* is widely used. Contrary to the other terms described above, this relates to climate and environmental issues, and not primarily economic issues. Besides, the authors' experience shows that *bæredygtig* has a positive connotation while other terms, as *nøjsom* have a negative connotation. *Bæredygtighed*, the Danish word for 'sustainability', is used in many different contexts with regard to the environment, biodiversity, climate change, resource use, as well as economics and organisation. The word was introduced in the report "Our Common Future" in 1987<sup>6</sup>. Prior to 1987, it was only used as a technical term to indicate, for instance, that the ground stability of a plot of land was sufficient to build a house on. Because the concept is so broad and widely used today, there has been some criticism in recent years that it has "lost its meaning", having been used so much that it no longer holds any particular power, or that the meaning of the word has become too broad and unspecific<sup>7</sup>. This criticism has arisen in public debate, among scientists and other opinion makers. A quick search of the word shows that it is used to describe everything from agricultural practices, management styles, household products and marketing techniques to building materials and

<sup>5</sup> [www.ordnet.dk](http://www.ordnet.dk)

<sup>6</sup> also known as the Brundtland Report (Report of the World Commission on Environment and Development: Our Common Future. Co-authored with the UN Secretary General. Published by United Nations and Oxford University Press, 1987)

<sup>7</sup> <https://www.kristeligt-dagblad.dk/kirke-tro/b%C3%A6redygtige-ord>  
<https://videnskab.dk/forskerzonen/naturvidenskab/hvad-betyder-baeredygtigt-forbrug>  
<https://www.altinget.dk/miljoe/artikel/baeredygtighed-er-et-misbrugt-begreb>



lifestyle. The word is often used to describe a product, to distinguish it as “better for the environment” or “greener” than other similar products, but this is often done without any form of documentation or explanation of how true it is. The Brundtland definition of the term is mentioned in many instances, but the actual use tends to be much broader than that.

Table 1 below shows the use of sufficiency-related words in the Danish media since 2000. The table shows how terms such as ‘energy use’ and ‘sustainable lifestyle’ are more and more employed in the newspapers and on TV, which is an indicator of their importance in the public debate.

The use is divided into two decades and then into a three-year period, to show whether there has been an increase in use since 2020.

	2000-2009	2010-2019	2020-2023
Bæredygtigt forbrug - Sustainable consumption	205	2030	1741
Energiforbrug - Energy Use	26.166	106.801	22.549
Skære ned på forbrug - Decrease in consumption ('To cut down on...')	464	1128	522
Grøn Omstilling - Green Transition	321	110.786	180.030
Bæredygtig livsstil - Sustainable Lifestyle	125	1429	1197
Energi effektivitet - Energy Efficiency	1474	9654	4676

Table 1. Searches in the Infomedia database for occurrences of concepts related to sufficiency in Denmark<sup>8</sup>

The use of the word ‘sustainability’ (bæredygtighed) in Denmark has largely followed that of the international community, commencing with the Brundtland Report in 1987<sup>9</sup> and spreading into both academic circles and public awareness. Over the past 7-10 years, awareness of climate issues has rapidly increased, along with the use of words such as ‘sustainable’ to characterize developments, constructions, and the like that have emissions within the limits set by climate targets.

Although the word bæredygtighed is very commonly used, it often seems to refer to something slightly different from ‘sufficiency’. It covers a much longer list of issues. The term ‘sustainability’ is very commonly used in the media, by politicians, by companies in their marketing and in the everyday conversations of Danes. It is used in many contexts: consumption, production methods, to describe a product or service, in regard to materials use, politics, lifestyle, management styles, buildings, and even economics.

Among Danish respondents interviewed in the framework of T3.2, sufficiency is associated with “saving resources and not throwing things away, but reusing them” (man, 32, Denmark). “For me, it is mostly about not wasting energy... I think about that a lot; how to do things in the smartest way, using as little energy as possible” (woman, 75, Denmark). They occasionally make the link with the biodiversity challenge.

<sup>8</sup> [www.infomedia.dk](http://www.infomedia.dk). The Infomedia Database allows you to search all published articles and tv-programmes in national newspapers and television, as well as most regional and local newspapers, magazines, news agencies and other media. Our searches in the database cover the use of the word(s) above in all articles in newspapers, magazines, online news sites and television programmes in the given time period..

<sup>9</sup> Our Common Future . Co-authored with the UN Secretary General. Published by United Nations and Oxford University Press, 1987



## 2.1.2 France

Sufficiency is called *sobriété* in France. It is derived from the Latin word *sobrietas* and was formerly applied to moderation in eating and drinking, but its meaning has gradually broadened. It has been used in the fields of energy and environmental issues for more than 20 years. Although there has always been strong criticism of the consumer society and over-consumption in France, particularly in the 1970s, the use of the specific term *sobriété* applied to energy or material consumption seems to have originated from the publication of the first négaWatt scenario in 2001 (Cezard, 2019). The term was notably popularised by the négaWatt Association through its energy transition scenarios explicitly based on energy sufficiency, efficiency, and renewables (Association négaWatt, 2018).

Over the 2000-2010 decade, the usage of the word remained relatively restricted to non-governmental and grassroots organisations. It began to spread more broadly until it eventually became part of the national legislation in 2015. The Energy Bill 2015-992 *relative à la transition énergétique pour la croissance verte* (related to the energy transition for green growth) makes energy sufficiency one of the State's policy objectives. In the following years, the scope of the concept grew further, until it became a mainstream term in the media and in public debate. During the 2022 national electoral campaign, several official sufficiency-based scenarios for climate neutrality were released, triggering a surge in media interest (Toulouse et al. 2022). At that time, the number of occurrences of the keyword '*sobriété énergétique*' more than doubled in the French media (reaching 240 per month<sup>10</sup>), including in leading newspapers and magazines. Following the adoption and presentation of a National Energy Sufficiency Plan in October 2022 by the government, the term is now commonly used by politicians, ministers, CEOs, opinion leaders, and journalists.

The outcomes of the 2021 Future of Europe conference prove that the concept of sufficiency is gaining public support. A randomly selected panel of 98 French people were given training on the EU and were tasked with ranking its most essential challenges by 2035. They placed "*Developing energy sufficiency to consume less and cease the superfluous*"<sup>11</sup> at the top of the list.

In French interviews, sufficiency is termed *sobriété*. A word that originally refers to alcohol or food consumption, and the ability to handle that consumption. A so-called sober person is someone who does not drink alcohol, hence the less than festive perception of this word. Indeed, a young woman interviewed said that she would prefer a more positive word, sounding less austere. In participants' minds, the word *sobriété* applied to ecological transition strongly refers to needs. "*Do not consume more than you need, the basic needs*" says a 40-year-old woman. "*Living with few needs*" says a 50-year-old man. *Sobriété* is seen as "an eco-friendly way of life, in which nature is a priority" claims a 47-year-old woman. Other words are suggested such as *suffisance* (sufficiency) which is related to "the feeling of being satisfied with little" (man, 44, France).

*"Sobriété' is seen as a matter for the rich, while 'suffisance' is more suitable for the poor"* (man, 30, France).

*"Sobriété' induces more sacrifice, more commitment, and more vision of future, it is more global than 'suffisance'"* (woman, 40, France).

Sometimes *sobriété* is perceived as too conceptual by the respondents. "Sufficiency is a global concept. This is not a word that I am concerned about. What I care about is awareness, what makes me act? What do you stand for?" (woman, 36, France). Alternative words have been put

<sup>10</sup> Analysis on the Europresse database over the last six months of 2021.

<sup>11</sup> Contribution citoyenne, conférence sur l'avenir de l'Europe, 26 novembre 2021. <https://www.participation-citoyenne.gouv.fr/sites/default/files/2021-11/20211126%20-%20COFE%20-%20Rapport%20final.pdf>



forward such as *décroissance* (de-growth). This latter word is more connected with a anti-capitalistic and voluntary simplicity social movements (man, 40, France).

### 2.1.3 Germany

In Germany, the topic of sufficiency has increasingly become the focus of public debate, although the term is still relatively new. The German word *Suffizienz* comes from the Latin *sufficere*, which means 'to have enough'. It was first employed by Wolfgang Sachs in 1993 in the context of a nature-friendly society and increased efficiency, he defined the term as deceleration (Sachs 1993). In terms of sustainability, sufficiency is one of three complementary strategies, with efficiency (how we achieve the same with less input) and consistency (how we achieve the same, but in a more sustainable / environmentally friendly way) being the other two. Sufficiency is about the level of consumption within the limits of the planet and global justice. It refers to the balance between the satisfaction of basic human needs and the personal, societal, and environmental limits of resource consumption.

In the German interviews, the word 'sufficiency' refers to "ausreichend" which means a sufficient quantity or a sufficient education. Respondents do not make the connection with lifestyles: "sufficient lifestyles - this is the first time I have heard of this" (man, 32, Germany). The concept is not well known. Among the initiative respondents, some have heard the word but do not use it. Once the term was explained: "Oh, that's my thing, I've always done in that way" (woman, 58, Germany). Among the panel respondents, only one person had heard the term before.

Some finally consider adding to it: "One might take sufficiency even further by appending climate positive effects to the term" (man, 32, Germany). "Sufficiency goes in the direction of zero growth in resource consumption" (man, 37, Germany).

### 2.1.4 Italy

In the Italian language, *sufficienza* (sufficiency) is a common word derived from the Latin *sufficere* "to be enough". In everyday language, it is widely used in the sense of: "to have enough of something". In addition to the Latin-derived meaning, *sufficienza* can also mean, in some sentences, "to show superiority or condescension". A common connotation of the word is that of a minimum positive judgment on the performance of a school (6/10) or a public employee<sup>12</sup>. The concept of 'sufficiency', in the sense related to sustainability and lifestyle changes, is declined in different forms, which may also entail the use of the word *sufficienza*. However, the use of the word *sufficienza* alone would not convey a meaning connected with sustainability issues (except for those sentences where this specific sense has been expressed before). Combining the word *sufficienza* with the adjective *energetica* confers a similar meaning to that of the English expression 'energy sufficiency'. This expression seems to have appeared quite recently in the Italian language and sounds directly derived from the English expression.

Other uses of *sufficienza* can be found in *economia della sufficienza* (sufficiency-based economy) as opposed to *economia della crescita* (growth economy) or in *società della sufficienza* (sufficiency society).

The concept of sufficiency is often expressed by other locutions based on the word consumption such as *consumo critico*, *consumo sostenibile* or *consumo responsabile* (respectively, conscious, sustainable, and responsible consumption), whereby the concept is extended to encompass the choice of not purchasing something. As in French language, the term *sobrietà* is also often used. In some cases, it is also a matter of integrating and complementing expressions related to consumption, which might seem restricted to purchasing activities only. The latter expressions are confined to individual choices, whereas in this project the definition of sufficiency,

<sup>12</sup> <https://www.treccani.it/vocabolario/sufficienza/>





in addition to individual choices and habits, embraces the infrastructures and the societal framework. Such a broad concept in Italian could be conveyed by the locutions *sufficienza energetica* or *società della sufficienza*, when convenient.

The use of the term *sufficienza energetica* is quite recent in Italy. Although this simple search is limited to texts that have been digitised and put online on Google, the expression 'energy sufficiency' seems to have become widespread in Italian documents only from 2010 onwards, whereas the equivalent English expression can be traced back to the 1990s.

The expression *Economia della sufficienza* is not very common and has only appeared on Google for a few years, while the term 'società della sufficienza' seems more prevalent. This term also began to be used from 2010 onwards, but initially mainly in reviews or comments related to a specific publication dealing with the topic<sup>13</sup>.

The sufficiency concept predates the use of the word *sufficienza* to convey its meaning. Before the emergence of the use of *sufficienza* in Italy, the concept of sufficiency was promoted by the degrowth movement and other environmental organisations in the early 2000s, using consumption-related expressions such as those listed above. Before the introduction of the term 'sufficiency', reference was also made to the need to change our way of living, *stile di vita*. A publication from that time is the magazine *Altraeconomia* (another economy), which was first published in 1999 and played a significant role in shaping and directing the discourse on alternative lifestyles. In addition, numerous citizen movements and environmental organisations have also contributed to raising awareness towards these topics among part of the Italian population.

It is worth mentioning that the concept of sufficiency, although not using this specific expression, started to develop as early as the oil crisis of 1973-74. During this period, measures were implemented to reduce consumption, and awareness about environmental issues, energy savings, lifestyle, and their interrelation began to spread. In Italy, in public debates on television or in newspapers following the recent energy crisis related to the war in Ukraine, analogies are often drawn with the measures adopted in those years to curb fossil fuel consumption.

The concept of sufficiency, in its Italian variants, is increasingly being used in all contexts and across the spectrum of human activities: heating, housing, transportation, food, clothing, and leisure. In terms of sustainability, 'sufficiency' means living within the social, environmental, and economic boundaries of our planet and society, as indicated by the well-known metaphor of the sustainable development doughnut model developed by Kate Raworth<sup>14</sup>. The discussion on degrowth can be traced back to the early 2000s.

Respondents in Italy mostly have no idea about the word without context. The word is mistakenly associated with scarcity, with not doing enough, or with a posh attitude, an air of self-importance. *"In fact, it immediately makes me think of two things, one is a complacent attitude (a slightly haughty attitude which I don't like), the other is a sufficient action, i.e., the sufficient things to do to achieve the goal. You don't enter excellence, and you don't enter insufficiency, but you are sufficient in doing those things"*(man, 44, Italy).

*"The scholar appreciation 'sufficient' is not such a good value! It makes me think of a big contrast between the scholastic meaning and the real meaning, in the sense that sufficiency should be a positive thing, i.e., if I have sufficiency, I am happy; whereas sufficiency at school was this thing just above sufficiency, so it was a bit rubbish. I think it should be re-evaluated, in the sense that if it's enough, it's good. If we are sufficient, that's great! We don't need any extra"*(man, 48, Italy).

When explained, the word refers to a community vision, a sensitivity to natural disaster due to climate change, it is linked to a concern for the future and for children. It is opposed to the satisfaction obtained through material goods. It induces awareness and time: *"Two factors can make the difference: time and awareness, because awareness also allows you to slowly make choices that lead you to change your style and not feel fatigued anymore"* (woman, 52, Italy).

<sup>13</sup> <https://altreconomia.it/prodotto/basta-il-giusto-2/>

<sup>14</sup> <https://www.energysufficiency.org/themes/the-doughnut-staying-in-a-green-and-safe-place/>



There is thus a link with the idea of awareness, in particular through a “conscious use of resources, which are limited” (man, 36, Italy).

From the fieldwork, it appears that the term ‘sufficiency’ is more related to the environment and the ecological transition by the participants of the intentional communities than for those in the panel, for whom it refers more to austerity and moral values.

## 2.1.5 Latvia

In Latvia, outside of academic groups working on sufficiency-related topics, where the English term is familiar and commonly used, the word ‘sufficiency’ or *pietiekamība* in Latvian is seldom used in sustainability contexts. The most prevalent use of *pietiekamība* is in economic discourse and refers to the ‘Capital adequacy.’ By contrast, ‘self-sufficiency’ - *pašpietiekamība* - is far more popular as a term to denote a certain degree of autonomy and ability to provide resources for oneself, where ‘oneself’ may refer to any kind of entity (from the individual to the state level). ‘Self-sufficiency’ in Latvian means “a situation where an individual or a group does not depend on the outer world”<sup>15</sup>. Similarly, ‘self-sufficient’ - *pašpietiekams* - is “one that can sustain, exist permanently and independently of others”<sup>16</sup>. The vocabulary of academic terms includes the entry ‘sufficiency principle’ - *pietiekamības princips* - which dates back to “Dictionary of Scientific Terminology” from 1922<sup>17</sup>. Recently the term ‘sufficient lifestyle’ has been approved by the Terminology Unit of the National Academy of Science as *ilgtspējīgs dzīvesveids* (meaning ‘sustainable lifestyle’, but has also been submitted for translation as *mērenība*, which is closer to ‘moderate’). The root of the word *pietiekamība* comes from the verb *pietikt*<sup>18</sup>:

*To be in required quantity, needed, desired.*

1. Used to indicate that the onset of an activity or condition can instantly cause another activity or condition.
2. To be performed or done to the extent that the continuation of the activity is no longer necessary, required, or desired.

*Pietikt* is also related to *iztikt* (‘to get along’) and *iztika* which means ‘livelihood’. *Iztikt*, however, often evokes connotations of ‘barely making a living’. *Pietiek*, which also means ‘enough’, is often used to describe a satisfactory sufficiency in sentences such as *man visa pietiek* or “everything is enough for me”. Such statements are also frequently used when people talk about *taupība* or ‘frugality’ and *taupīt* or ‘thrift’ as a moral value, for example when describing energy-saving practices. In this context, most people (mostly practitioners) interviewed in the FULFILL project consider sufficiency to be a state where there is enough of anything. However, some people also mention the lower limits of sufficiency (poverty factor).

In Latvia, the meaning of the word ‘sufficiency’ does not have a direct connection with environmental sustainability. However, the link becomes obvious when context is provided in the communication. Since sufficiency refers to a measure or quantity, it tends to evoke moral dispositions towards habits and lifestyles. The transition from Soviet shortages of goods, the collapse of the welfare system in the 1990s and the ‘belt-tightening’ of the 2008 austerity regime has created a discourse in which individualistic sufficiency is morally valued as a type of ‘freedom’ but is also critiqued as a ‘lack’ when compared to the Western European well-being associated with increased consumption. Furthermore, sufficiency may resonate with traditionalism and resource-saving tasks associated with household management and gender role imbalance. Here, a biased side of self-sufficiency emerges, as the practices and moral values of resource saving

<sup>15</sup> <https://tezaurs.lv/pa%C5%A1pietiekam%C4%ABba>

<sup>16</sup> <https://tezaurs.lv/pa%C5%A1pietiekams>

<sup>17</sup> <https://termini.gov.lv/atrast/pietiekam%C4%ABbas%20princips/lv>

<sup>18</sup> <https://tezaurs.lv/pietikt:1>





may be at odds with individual rights and freedoms. Hence, in sufficiency, there are social controlling ties involved in the supply of resources. Therefore, 'having enough' is central to the linguistic meaning of sufficiency which leaves room for relative and conflictual interpretations, as moral judgment is a matter of social class.

The term 'sufficient lifestyles' is very rarely used in the Latvian spoken language, in academic discussions or in policy making. However, there are many public debates related to sufficiency (e.g., energy saving, cycling infrastructure, reduction of meat consumption), demonstrating that some of these issues are important to the public. One of the most recent debates was related to the information campaign "Don't eat the planet" (*Neapēd zemeslodi*<sup>19</sup> is the Latvian analogue of Veganuary<sup>20</sup>) which encourages people to switch to vegetarian and vegan diets and which has been the subject of much criticism from farmers' associations (LOSP, Zemnieku Saeima) and climate change sceptics.

Among the Latvian respondents interviewed in the framework of task 3.2., the word most often associated with the term sufficiency is 'enough': "*when it is enough, no extras are required*" (man, 36, Latvia). The word 'sufficiency' also refers to over- and under-consumption (woman, 36, Latvia). Participants associated sufficiency with food, energy, and housing. Some of them distinguished between forced and chosen sufficiency. "*Sometimes people are forced into sufficiency because they don't have enough money or so. But we aim for voluntary simplicity*" (woman, 48, Latvia).

In Latvia, there are several dominant discourses on sufficiency that, however, do not employ the terms 'sufficiency' or 'sufficient lifestyles' and do not usually have a direct connection with environmental sustainability. Questions about what is 'sufficient' often involve discussions about basic needs, quality of life and what constitutes comfort and security, where the line is hard to draw. Thus, a sufficient lifestyle in Latvia can rather be defined as a lifestyle that provides the personal freedom and resources to fulfil, adapt and rethink one's needs in relation to others.

## 2.1.6 India

India's National Language is Hindi but is by no means the most widely spoken language nor is it a dominant hegemonic culture-shaping factor in many animated local and regional socio-political discourses. India in our view is largely a greatly heterogenous constellation of regional socio-political 'zones' which are interwoven in a complex enmeshed web of socio-economic-cultural and political relationships but also possess and actively practice an intensely guarded autonomy through its regional institutions and actors. It would be intellectually perilous and greatly reductive to interpret India as a 'unified' homogenous 'world' where single ideas related to 'sufficiency' or any ecological-social concept for that matter, is all pervasive and to which a majority of its constituents subscribe.

The word in Hindi that is perhaps most reverberant with the concept of 'sufficiency' would be *paryaapt*. As a socio-political and economic concept however, its connotations are perhaps best conveyed through the term *atmanirbharta* which when literally translated means 'self-sufficiency' but is often used to indicate favourable attitudes and dispositions towards local production and consumption within the ecological limits placed by the regional landscape and 'natural wealth' as well as culturally embraced ideals of humility, modesty and self-restraint.

The term sufficiency as a tool of critical interpretation of modern capitalist industrial society's conjugation with attitudes, systems and practices that foster the hubris of hyper-individualistic gratification of wants and infinite economic growth that is predatory towards social equity and ecological sustainability, is also historically and conceptually conflated with the Indian term *swaraj* which can be loosely translated as 'self-rule' and refers to a combination of individual and collective autonomy and mutual responsibility. As a term it seems to have entered common parlance during the years of India's freedom struggle against its colonial oppressor, the British Empire<sup>1</sup>.

<sup>19</sup> More information on the website <https://neapedzemeslodi.lv/>

<sup>20</sup> <https://en.wikipedia.org/wiki/Veganuary>



The term and its implications represent to many practitioners of an ecological politics in India, a trident critique of, and resistance to, dogmatic and orthodox market-based conceptions of humans as atomically divided persons who are often disembodied from local communities and their cultural ecological landscapes in any meaningful material way beyond a superficial sentimental identification with it. It can be posited that *swaraj* and other terms belong to the same constellation of critical ideas, problematize the transmogrification of embedded societies into uprooted and rootless individuals animated by the motivations and imperatives of the utility maximizing globalized homo-economicus unyielding to any force besides those of the totalizing logic of market which reduces all conceptions of value to the reductive, parochial conception of short-term economic value and brazenly measured in pure monetary terms.

It is commonly used in its authentic sense mainly amongst subaltern ecological practitioners who are strident critics of the normative 'development' (green, sustainable or otherwise) paradigm and view hegemonic ideas emergent from a 'globalization' mindset with intense skepticism. The term has re-entered common parlance amongst bourgeoisie society, that is otherwise largely apathetic towards ecological, climate and social equity issues, in a form that is rather disconnected from its initial conceptions of implying a human-scale of politics and economics within local ecological and social limits). In this deradicalized form, it is a term that is laden with nationalistic rhetoric. For instance, the current National Government's Make in India Mission targets the objectives of producing nationally most goods and services that India needs, through the economic might of neoliberal capitalist corporations, and despite the negative impacts on land-based communities and the labour exploitation it generates. The extraction and appropriation of raw material by this predatory capitalist economy merely reproduces colonization at the national scale and is in total contradiction with the original Gandhian economic vision of local, resilience-based 'sufficiency' economics.

Data from the respondents from the underprivileged neighbourhood shows that sufficiency is seen predominantly under the lens of income inequalities and social justice. Consuming based on needs, avoiding competition, being aware of the world and economic injustices around, repairing products instead of throwing them away and considering if something one wants to throw away might be useful to someone else. Some respondents also indicated the need for more resources to be able to live sufficiently. One respondent suggested that the affluent should live the way covid-19 taught people to live. Affluent lifestyles are particularly targeted as wasteful.

*"Compete but only based on how much you need for survival. I have a two-wheeler but if I aspire to buy a race bike then I enter the competition. My needs are met by my current bike, and I am happy with that. So why will I think of buying the race bike? Someone might have a higher budget, but they should stop and think- if my 60-inch tv is comfortable for me, do I need to buy a 120-inch tv? I have 2 fridges and then do I need another one? They keep exchanging things. They use something for 4 months and if a new version comes in the market, they will exchange it."*

(man, 35, India)

In the ecovillage, sufficiency is more described as a conscious choice and a lifestyle that is based on spiritual, ecological and social equilibrium rather than material affluence:

*"Spiritual reflections on who we are, where do we come from and where do we go is necessary. External life is not the source of your fulfilment and fulfilment must come from within"*

(man, 60, India).

## 2.2 National and cultural specificities with regard to lifestyles and energy

In this section, we explore the national differences between lifestyles and energy cultures in the six countries. Social practices are deeply embedded in historical and cultural patterns, as well as material infrastructures. Those are likely to influence the policy levers at national level.



## 2.2.1 Denmark

Denmark was hard hit by the oil crisis in the 1970's, where high oil prices hit the economy badly and there was a risk of lack of supply. The oil crisis left a long-lasting impression in the population as well as in the state administration. The oil crisis and the related campaigns to save energy were even mentioned by some of the people interviewed in this project when speaking about energy sufficiency.

The energy crisis in the 1970's led to strong building codes, where houses, built after 1974, have a relatively high insulation standards compared to the houses in other European countries with the same climate. The difference is reducing for newer buildings, as EU regulation now aims at high standards in all countries.

While the fundamental physics for nuclear power was developed in Denmark with Nobel laureate Niels Bohr and others<sup>21</sup>, nuclear power was not developed in Denmark. Proposals to develop nuclear power was stopped by large public protest campaigns and movements against it in 1975-1985, ending with a parliamentary decision in 1985 to exclude nuclear power from the Danish energy planning<sup>22</sup>. This decision was followed by plans for increased use of renewable energy and natural gas, as well as expansion of district heating with combined heat and power plants as the main heat source. It was also followed by energy saving campaigns with a particular emphasis on saving electricity that was primarily produced by coal power.

Already from the late 1990's coal power construction was not allowed in Denmark, partly for climate reasons, partly because there are no coal resources in Denmark while Denmark in those days was self-sufficient with oil, gas, and renewable energy.

Denmark has a long tradition of organising economic activities in cooperatives, where in the energy sector in particular the consumer cooperatives are important. Municipal energy supply companies are also important, as is the case in several other countries. Compared to other countries, the district heating supply is the most remarkable. Regulation supports the cooperative and municipal ownership with a non-profit requirement, so it is not interesting for private business to engage in district heating, and with municipal guarantees for loans in district heating, which give low-cost financing. This has led to a very dynamic district heating sector that is using the potential of the technology to change quickly for many households and use a large number of heat sources, keeping heat prices stable and possibility to change fast to renewable energy. Today 2/3 of Danish households and most institutions and offices have district heating.

As a rich country with a cold climate, Denmark has large residential dwellings, and the size of dwellings keep on increasing, both with new houses and with extension of existing houses.

Denmark used to have high taxes on energy and cars, making Danish consumers buy more energy efficient equipment and energy efficient (small) cars than neighboring countries. Electricity taxes and expensive electricity also discouraged electric heating. Over the last decade the car taxation has been reduced with the result that Danish people now buy larger and less efficient cars. From 2022 also the electricity taxes are reduced, but given the current energy crisis, it does not seem to influence the energy efficiency of the equipment sold.

As a rich country, Denmark has one of the highest per capita productions of waste in Europe with large waste streams from all sectors. This has led to the construction of as many as 28 incinerators that now also supply heat via district heating to a number of towns<sup>23</sup>. The plan is to increase recycling and close some of the incinerators.

Danish people have some of the highest per capita meat consumption, partly driven by a large agricultural sector with high production of meat at a relatively low cost. There are attempts to

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<sup>21</sup> Encyclopedia Britannica, entry on Niels Bohr

<sup>22</sup> Faktalink, published by DBC DIGITAL, a publicly owned Danish information company, website <https://faktalink.dk/atomkraft/atomkraft-danmark>, accessed 30/1 2023

<sup>23</sup> DAKOFA, Danish Network for Waste and Resources, online information, <https://dakofa.dk/vi-densbank/affaldsforbraending/> accessed at 30/1 2023



reduce meat consumption and many people eat less meat, for some because of official health advice to reduce meat consumption<sup>24</sup>. There are, however, no policies for reduced meat or dairy consumption. A Danish researcher estimates that meat consumption is reducing 1-2% per year<sup>25</sup>. A survey from researchers at the University of Copenhagen from 2021<sup>26</sup> shows that 37% of Danes reduced meat consumption 2020-2021, which is below the average of the 9 European countries also included in the same survey.

## 2.2.2 Germany

While Germany was a leader in renewable energy production in the early 2000s, the expansion of both solar power and wind turbines has stagnated since then. The country has a long history of using coal and lignite, and while the phase-out of coal has been decided for 2038 at the latest, and possibly 2030, the energy crisis and fears of a gas shortage have led to a resumption of coal burning in 2022.

At the political level, targets and precise policies towards sufficiency are still lacking. In 2022, the IPCC has defined sufficiency policies as "a set of policies and everyday practices that avoid demand for energy, materials, land and water while ensuring human well-being for all within planetary boundaries" (Intergovernmental Panel on Climate Change 2022). In Germany, the first approaches to sufficiency can be found since 2020, with dietary recommendations that take into account the Paris climate goals, measures to reduce animal husbandry, strengthening public transport and improving services, as well as encouraging behavioural changes in the building sector (Best 2022). The new German government formed in November 2021 addressed similar issues in its coalition agreement, and the Federal Ministry of Economics explicitly emphasised the importance of reducing energy consumption (SPD, Die Grünen, FDP 2021; German Ministry of Economics 2021).

The country is struggling to reduce its emissions in the transport sector. In this context it is important to note that Germany's economy is strongly influenced by its strong car industry which partly has a strong focus on spacious and high-end vehicles. During the energy crisis in 2022 this led to contradictory measures from a climate mitigation perspective, i.e., subsidies on gasoline as well as the availability of a cheap nation-wide ticket for public transport ("9-€-Ticket") in summer 2022 which was now introduced as a permanent offer at the price of 49 €.

In terms of meat consumption, a proposal for a "Veggie-day" in canteens etc. by the German green party a few years ago led to heated discussions for one summer<sup>27</sup>. However, more recently, some places are discussing more (or entirely) vegetarian and vegan options. The city of Freiburg decided in October 2022 that only vegetarian food will be served in schools and kindergartens from 2023 which again led to nation-wide discussions, but so far, the city is keeping its decision (Jakob Pontius 2022).

<sup>24</sup> Danish Veterinary and Food Administration " Nu får De officielle Kostråd en ny form", news 18/11 2022, online at <https://www.foedevarestyrelsen.dk/Nyheder/Aktuelt/Sider/Pressemeddelelser%202022/Nu-f%C3%A5r-De-officielle-Kostr%C3%A5d-en-ny-form-.aspx> (accessed at 25/1 2023)

<sup>25</sup> quote of senior advisor Sisse Fagt, Danish Technical University, National Food Institute, to the online media Avisendanmark.dk, published December 25, 2021

<sup>26</sup> [https://nyheder.ku.dk/alle\\_nyheder/2021/11/danskerne-har-nedsat-koedforbruget--men-vi-halter-efter-de-andre-europaeere/](https://nyheder.ku.dk/alle_nyheder/2021/11/danskerne-har-nedsat-koedforbruget--men-vi-halter-efter-de-andre-europaeere/)

<sup>27</sup> [https://de.wikipedia.org/wiki/Kontroverse\\_um\\_den\\_Veggietag#:~:text=Der%20Veggietag%20im%20Wahlprogramm%20der%20Gr%C3%BCnen,-Im%20November%202010&text=Der%20Beschluss%20wurde%20mit%20dem,%20Konsumgewohnheiten%E2%80%9C%20bewegt%20werden%20k%C3%B6nnen.](https://de.wikipedia.org/wiki/Kontroverse_um_den_Veggietag#:~:text=Der%20Veggietag%20im%20Wahlprogramm%20der%20Gr%C3%BCnen,-Im%20November%202010&text=Der%20Beschluss%20wurde%20mit%20dem,%20Konsumgewohnheiten%E2%80%9C%20bewegt%20werden%20k%C3%B6nnen.)



### 2.2.3 France

France has the particularity of having a highly centralised State, in which the energy policy is mostly set by the central government. In parallel, it has a tradition of State intervention, regulation, and public spending to influence markets and many aspects of lifestyles. The population also has a strong feeling for social justice and a high level of distrust towards policy-making, political parties, media and opinion leaders.

Energy policy is an important political topic and has always been controversial due to the choice of the nuclear energy as the prime energy source. The existence of a national plan for the development of the nuclear energy has led to a high level of electric heating and electric water heaters, leading to regular peaks in power demand during the winter. Electricity is highly decarbonized, due to the very high share of nuclear power.

With regard to transportation, public transport is well-developed in cities but lacking in the countryside. The high-speed railway is well developed, but the high-speed roads are even more so. Culturally, the French gastronomy leads to an important cultural attachment to meat consumption. A strong inclination for the model of the detached family house (and the car that goes with it) has led to the development of an important urban sprawl.

The oil crisis in the 70's had triggered a number of energy-saving policies, notably in the mobility sector, that were eventually dropped when the crisis ended. Although the national energy agency ADEME was born in that time and is still in operation, energy saving policies became much less popular in the following decades and limited to subsidies and technical regulations (such as building codes). The massive development of nuclear energy in that period also led to a concomitant tendency to stimulate electricity consumption and rule out any moderation (as illustrated by the significant deployment of direct electric heating).

In response to the climate mitigation challenge, a renewed interest for sufficiency emerged from the mid-2010's onwards, in subsequent steps: 2015 Energy Bill, 2016 national Long-Term Strategy for climate, 2019 Citizen Convention on Climate Change, 2021 Climate and Resilience Bill, 2022 National Energy Sufficiency Plan. The focus mostly remains on energy, although some policies addressing resource sufficiency more broadly have also been considered (regulation of single-use plastics, punishment of planned obsolescence, support to product repairing, etc.).

### 2.2.4 Italy

The energy demand in Italy is certainly influenced by specific cultural and lifestyle factors. An exhaustive analysis of these aspects, however, lies beyond the scope of this introduction and would require the implementation of a in depth research. The following are a few key examples of the main elements that characterise the demand and differentiate it from other countries. The brief information reported refer to the differences with the other countries which are part of the consortium: Denmark, France, Germany and Latvia.

At the end of the 1980s, Italy made the decision to phase out nuclear power and coal, leaving gas as the primary energy source. This choice was partially driven by the need to reduce dependence on oil supplies from the Middle East, as outlined in various national energy plans. As a result, Italy became reliant on gas imports from Russia<sup>28</sup>.

Gas plays a crucial role in Italy for space heating and domestic hot water, more so than in other countries<sup>29</sup>. This disparity can be attributed to infrastructure-related factors, such as the widespread gas network, which are a result of past energy policy decisions rather than cultural preferences.

Gas is also widely used for cooking in Italy. While infrastructure is a contributing factor, there is also a cultural aspect at play. The country's food culture places a strong emphasis on home

<sup>28</sup> <https://artemisialab.it/la-crisi-del-gas/>

<sup>29</sup> See appendix 1





cooking, and there is a preference for using gas rather than electric appliances for cooking<sup>30</sup>. However, this cultural aspect has not been thoroughly explored or investigated.

Due to its warm climate, air conditioning is extensively used in residential buildings in Italy, which contributes to a substantial portion of energy consumption. The need for air conditioning is particularly high during the summer months when temperatures rise. Additionally, Italy's popularity as a tourist destination leads to an increased demand for energy during the summer, as tourists often require cooling in hotels, restaurants, and other accommodations. The combination of the local climate and the influx of tourists during summer months results in heightened energy consumption for cooling purposes.

	Current cooling supplies (TWh)
Denmark	0
Germany	20
France	22
Italy	49
Latvia	0

Table 2. Cooling supplies in TWh in the five countries of the FULFILL project (data from STRATEGO European project, 2015)<sup>31</sup>

Regarding transportation and mobility, Italy has one of the highest motorization rates in Europe: in 2021, it was 675 passenger-cars per thousand inhabitants, versus 567 for the EU-27 average<sup>32</sup>.

## 2.2.5 Latvia

One factor that influences energy demand in Latvia is the climate. Latvia has a temperate climate, with cold winters and mild summers, which can result in higher energy demand for heating during the winter months. In addition, Latvian culture places a high value on warmth and comfort in the home, which can also contribute to higher energy demand for heating. Latvia is rich in forests (more than 50% of the country is covered by forest) and thus there is a large share of forest biomass in heating systems. Biomass use for heating has triggered some of the recent debates about the value added of forest biomass.

Another factor that can influence energy demand in Latvia is the country's level of economic development and its post-Soviet heritage. Latvia is characterized by a large share of households living in poorly insulated multiapartment buildings from the Soviet time which were built with centralized heating systems. These systems were often inefficient, contributing to higher energy demand and consumption and problems related to collective decision-making to manage these buildings. In many municipalities, but especially in the capital Riga, privatization of housing (resulting in a significant homeowner majority) and fragmentation of maintenance responsibilities have made renovation rare.

Constructing the image of national identity through single-family homesteads before WW1 together with Soviet restrictions on certain types of organizing and neoliberal restructuring of the economy in the 1990s has created an image of Latvians as individualists. Thus, most discourses of sufficiency focus on self-sufficiency in the end hampering initiatives that invoke broader sharing of resources, such as freecycling, co-housing, and ecovillages.

<sup>30</sup> See appendix 1

<sup>31</sup> D 2.2 Quantifying the Heating and Cooling Demand in Europe. STRATEGO project supported by the Intelligent Energy Europe Programme (Data refers to year 2010)

<sup>32</sup> [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Passenger\\_cars\\_in\\_the\\_EU](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Passenger_cars_in_the_EU)



## 2.2.6 India

Indian energy consumption is characterized by deeply inequitable energy use across social classes – directly linked to income and per capita apartment living area. Residents of larger apartments are clearly causing greater climate breakdown (through significantly more energy use) because of higher per-person space consumption. Paradoxically its these same persons ,with the higher climate breakdown impact, who lay claim to greater 'energy efficiency' (by getting their residences and offices green building certifications) due to the illusory area based energy performance index (EPI, kWh/m<sup>2</sup>/year); a per capita based EPI Metric (kWh/person/year) would be more revealing of the real climate impact of the inequitable energy distribution amongst urban lifestyles of the elite versus the middle and lower economic classes.

Inequalities in energy consumption are redoubled by inequalities in energy access and provision, with planned periodic power outages, especially in smaller towns and residential areas inhabited by marginalized urban poor, in summers (primarily fuelled by inexorable rise in Air Conditioning installations in India with installed capacity double every 6 to 7 years).

The political debates related to limits to growth, alternate conceptions of growth, except for the radical ecological-political web of civil society institutions, are fixated upon largely the geo-political inter-national dimensions of the equity discourse e.g., at the UN Climate Negotiation level. It seems largely absent from 'domestic' or intra-national equity discourses (except in the kinds of niches described earlier and later in report) within India despite there being compelling factors i.e. a stark heterogeneity of income-classes and riddled with social tensions and conflicts related to high levels of economic disparity, that could foment a vibrant socio-political discourse related to sufficiency (at least a rigorous interrogation of its inextricable relationship with more equitable redistribution of wealth and power in Indian society).

India's formal history of sufficiency policies is meagre unless one counts 'efficiency' policies as a subset of them. Perhaps the closest sufficiency polices have manifested as a mainstream political force is the land-rights and land-redistribution movements, especially the 'bhoodaan' (literally standing for land-gift) movement of the 1950's which was initiated and propagated by Vinobha Bhave. This movement consisted of landlords who'd benefited from massive land-grants and endowments made to them by the British colonial government, to win their political and social allegiance, returning these lands acquired through exploitative means from indigenous communities, to the commons and eventually distributed back to landless peasants.

Diverse social justice policies could be interpreted as 'sufficiency' policies. This is the case of the progressive electricity tariffs (i.e., telescopic pricing) that prevail across all major utility providers in India. It is also reflected in the rigid limits to the quantity of municipal water made available to urban citizens in some locations through a water distribution system that stipulates a defined quantum available per residential unit irrespective of apartment size, willingness to pay etc.

Under the profound influence of Gandhi, the work of the British-Indian architect Laurie Baker focused on vernacular architecture revival, use of local materials, simple life concepts, and are coherent with low-energy developments in summer comfort concepts in the North, as embedded in the recently updated Standards ASHRAE 55 and EN 16798. The irreverence towards global norms of 'comfort', as manifest most starkly in the challenge being mounted by Indian building science experts to dismantle the dominance of hegemonic and monocultural conceptions of 'thermal comfort' as defined by ASHRAE and other institutions that embody a reductive determinism of industrial capitalist societies, is perhaps also epistemologically related to the post-modern experiments in reviving vernacular contextually appropriate architecture in India. In the last 10 years, the Indian Built-Space economy has formally adopted the Indian Model for Adaptive Comfort (IMAC) which can perhaps be interpreted as a sufficiency policy. The IMAC foregrounds alternatives to electromechanical artificial air-conditions systems, reducing the demand for these energy intensive systems by legitimizing and recognizing alternate interpretations of thermal comfort by peoples of Indian ethnicities, physiologies and the traditional forms of architecture which underscored natural ventilation and other passive cooling methods as equally legitimate 'technologies' to achieve thermal comfort.





Our work on dissecting the incipient uptake of 'sufficiency' attitudes amongst elite, affluent classes who have till now exhibited ostentatious consumption patterns and espoused a high-carbon-footprint lifestyle, have revealed the tenacity of a presumed nativist virtue of the 'traditional Indian lifestyle' as being inherently virtuous and low-carbon in nature, as a discourse and opinion-shaping force.

Preliminary surveys conducted in 2018-2019 for the purposes of an internal study on sufficiency attitudes amongst India's affluent class, involving approximately 40 affluent residents of Townships in India explored whether the perceived absence of this (concept of sufficiency) awareness stems from a) absence: from the general absence of per-capita (or sufficiency) criteria in the normative environment that they subscribe to, b) indifference: indifference or deep apathy towards the energy use issue, or c) aversion : aversion towards the idea of limits (energy, carbon etc.) despite caring for energy issues. The environmental behavior/attitude surveys & story circles revealed that despite being frequent fliers (domestic and internationally) and consuming exceptionally high amounts of electricity (> 1800 kWh/person/year) they were influenced by environmental considerations in their daily consumption decisions and other urban-life habits. For instance, 30 % consider product sustainability in buying decisions (on-par with durability and brand) and 67% are willing to pay a higher price for 'conscious' food (local, organic etc.). Also, 62% take their own bag to the grocery store to shop and 60% to 90% recycle bottles/cans, limit shower-time, switch-off lights when not needed etc. Furthermore, 38% don't mind buying refurbished products and only buy according to 'need' and 52% indicated they try to fix broken products before discarding them. Preliminary investigations to assess the epistemological nature of the environmental discourse prevalent amongst affluent urban Indian citizens unveiled the presence of 'efficiency' based thinking as a decision-filter. Concomitantly, only a marginal presence of 'needs'-based thinking was detected in this socio-economic class which alludes to a tenuous relationship with the ideas of 'enough' (eg. how much energy does one need, how large does a home need to be to fulfil practical but also other non-utilitarian needs). Furthermore, the following undercurrents were palpable in the discourse surrounding 'actions': there was palpable apprehension about accepting individual responsibility for contributing towards climate change and unsettling ambivalent feelings about compromising on current lifestyles in order to reduce their carbon footprint. It can therefore be postulated that the environmental discourse amongst affluent urban Indians is deficient in terms of emphasis on sufficiency or 'enough' in limiting environmental harm. The situation appears to call for an infusion of sufficiency ideas into this discourse which presents a relative vacuum; indifference or aversion to the concepts of sufficiency aren't the dominant shapers of the discourse.

## 2.3 Current situation with regard to the energy crisis

The 2022-2023 years during which the socio-anthropological data of FULFILL was gathered is a particular historical context characterised by the impact of the war on Ukraine on energy provision and prices. The outburst of the war in February 2022 has led to significant, but yet very diverse consequences among the countries under study. In this section, we thus summarise the main impacts especially on energy prices which, as we explained in D3.2., have increased dramatically in many countries and resulted in political decisions to mitigate the impact on citizens.

### 2.3.1 Denmark

In Denmark the effects of the energy crisis have been higher prices for electricity, fuel, and heating, as elsewhere in Europe. For most household consumers, the heating costs have not increased as most of the district heating companies have maintained a stable price, while homes heated with gas, electricity and wood pellets have experienced much higher prices in 2022 than previous years. These high prices are expected to continue during 2023, while the expectation is that at least the electricity price will return close to former levels within 2-3 years.

The reason for the constant district heating prices is a combination of:

- use of co-generation of heat and electricity (CHP), where the high electricity prices have benefited the co-generation stations that are owned by the consumers or deliver heat



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with contracts linked to the economy of the co-generation plant (66% of district heating is made on CHP plants, all fuels are used for CHP)

- heat from waste incineration (20% of heat supply)
- use of wood chips, straw and biogas for district heating, fuels where the price increases are modest
- long-term fuel purchase contracts for wood pellets
- use of some remaining coal (6% of heat supply)
- non-fuel heat supply from solar heating and industrial waste heat (5% of heat supply combined)

A few district heating users in district heating systems supplied with natural gas have experienced high prices, like natural gas users.

Denmark has relatively high taxes on electricity, gas and oil products for household consumers, which have reduced the relative effect of the price increases.

Consumer prices	Gas per m <sup>3</sup>	Electricity per kWh	Petrol (95 oktan) per ltr
<b>Average 2017-2021</b>	7,64 DKK = 1,03 €	2,11 DKK = 0,28 €	12,16 DKK = 1,63 €
<b>1. quarter 2022</b>	15,58 DKK = 2,23 €	3,14 DKK = 0,42 €	15,09 DKK = 2,03 €
<b>2. quarter 2022</b>	17,79 DKK = 2,39 €	3,40 DKK = 0,46 €	17,63 DKK = 2,37 €
<b>3. quarter 2022</b>	22,72 DKK = 3,05 €	4,82 DKK = 0,65 €	16,63 DKK = 2,23 €
<b>Oct.-+ Nov. 2022</b>	n.a.	2,78 DKK = 0,37 €	16,03 DKK = 2,15 €

Table 3. Average final consumer prices for gas, electricity and petrol, Denmark, 2017-2022 (source : Danish Energy Agency Prisdatabase<sup>33</sup>)

In addition to consumers, also the commercial sector is hit by the high energy prices, including many SMEs (Small and Medium Sized Enterprises) as shops that have high electricity costs for cooking and cold stores for food in for instance shops. Some smaller shops and other SMEs have closed because of a combination of high energy (mainly electricity) prices and the lower private consumption with generally higher consumer prices.

During 2022, Denmark has introduced a number of policy measures to respond to the energy crisis to mitigate the high prices, to reduce the use of fossil fuel, and to increase the renewable energy production in particular for renewable electricity. In addition, many families and companies are changing heat sources, in particular changing from gas to heat pumps or district heating.

The new policy measures to mitigate the high energy prices for consumers are:

- One-time in payment "varmecheck" (in English: heating check) of 6000 DKK (805 €) in 2022 to all low and middle income families with household income below 650.000 DKK (87.200 €) having heating by gas, by district heating with over 65% of the district heating

<sup>33</sup> <https://ens.dk/service/statistik-data-noegletal-og-kort/energipriser-og-afgifter>, assuming same electricity transmission and distribution prices in 2022 as previous year.

coming from gas, or electric heating, including heat pumps, where the electricity demand was over 1500 kWh in December 2021<sup>34</sup>.

- Loans called vinterhjælp (in English “winter help”) to cover increases in gas and electricity bills above the levels in 4th quarter 2021, starting 1. October 2022 and running for one year. Also increases in district heating costs are covered for consumers connected to the 10 most expensive district heating companies. The loans have to be paid back within 4 years with a 2% p.a. interest rate. There is no income level limit for this scheme. Companies are also eligible for the scheme, but with an interest of 4,4% p.a.
- Reduced electricity tax, with reduction from 0,90 DKK/kWh until 30. June 2022 to 0,76 DKK/kWh in 3rd quarter 2022 and 0,72 DKK/kWh in 4th quarter 2022. In the first half of 2023 the electricity tax is reduced to 0,008 DKK/kWh and then it will increase to 0,70 DKK/kWh. The tax applicable to normal households and public buildings, while business and electricity for electric heating including heat pumps is only charged 0,008 DKK/kWh. The reduction is not dependent on income levels<sup>35</sup>.
- One-time payment to families with children below 18 years of 600 DKK (81 €) per child in January 2023. No income or energy consumption limit for this payment<sup>36</sup>.

The new policy measures to support for changing of energy sources are:

- All consumers with gas heating should, until the end of 2022, be informed about their possible future heat supply, specifying if they can get district heating. This was agreed between the government and the municipalities that have the responsibility for heat planning on 29. June 2022.
- For areas outside the reach of existing district heating systems, municipalities got state funding to assess the feasibility of establishing new, small district heating systems<sup>37</sup>.
- Increased state funding for disconnecting households from gas supply. There is a fee to be disconnected from the gas network and this funding is paying the fee for the consumers, the measure is to increase the fund to subsidise more disconnections.

In addition, there is a political agreement to increase renewable energy (wind and solar) with a quadrupling of on-shore (land-based) wind and sun capacity until 2030 and a five-fold increase of off-shore windpower<sup>38</sup>. There are, however, no policy measures in place yet for this plan.

The new policy measures for increased energy efficiency are:

- Reduction of temperature in most public buildings to 19°C from 1. October 2022<sup>39</sup>.
- National energy saving campaign with information on how to save energy in all sectors, electricity as well as heat<sup>40</sup>.

<sup>34</sup> Danish Energy Agency information sheet “Varmechecken er blevet udbetalt”, online at <https://ens.dk/node/3904/pdf> (accessed 25/1 2023)

<sup>35</sup> Danish Ministry of Finance, “Aftale med KL om klar besked om fjernvarme”, 29. June 2022, online at <https://kefm.dk/aktuelt/nyheder/2022/jun/aftale-med-kl-om-klar-besked-om-fjernvarme> (accessed 25/1 2023)

<sup>36</sup> Danish Ministry of Finance, op.cit.

<sup>37</sup> op cit

<sup>38</sup> Danish Ministry of Climate-, Energy- and Supply, „Aftale om et mere grønt og sikkert Danmark”, 25. June 2022, available online at <https://www.regeringen.dk/nyheder/2022/aftale-om-et-mere-groent-og-sikkert-danmark/> (accessed 25/1 2023)

<sup>39</sup> News from Danish Broadcasting Corporation (DR) 8/9 2023, available online at <https://www.dr.dk/nyheder/politik/ministre-her-skal-danskerne-spare-paa-stroemmen-og-varmen> (accessed at 25/1 2023)

<sup>40</sup> Danish Energy Agency, <https://spareenergi.dk/partner/national-energisparkampagne>



There are existing subsidy schemes for increasing energy efficiency and changing heating source to quit oil and gas heating. These subsidy schemes continue, both for households and for business. These follow the EU energy saving directive.

### 2.3.2 Germany

Energy prices in Germany are still high and the potential to reduce energy consumption not only through energy efficiency (e.g. insulation or energy efficient appliances), but also through behavioural change is increasingly being addressed. In the wake of both the Covid-19-pandemic and the war in Ukraine, which led to the energy crisis, three relief packages have been developed to reduce the burden on people (German Ministry of Finances 2022).

The measures included in these packages are mainly financial, including one-off payments to vulnerable groups such as social welfare recipients or single parents, grants for paying heating costs. Costs for mobility were subsidized from June to August 2022 through the so-called 9-€-ticket (costing 9 euros per month for all public transport but long-distance / high-speed trains) and reduced taxes on fuels. Additionally, caps on gas and electricity prices (German Ministry of Finances 2022). The growing fear of an increase in the number of energy poor households has been the reason for recommendations to adapt ones' behaviour and reduce energy consumption through heating less, using appliances less, showering less and cold and similar options (Best 2022). However, the policies that have been put in place mainly provide relief without directly addressing reduced energy consumption, which is left primarily to households that cannot afford energy services due to increased energy prices. Best et al. (2022) proposed short-term and mid-term measures to reduce the energy demand in the different sectors, e.g., a general speed limit on German auto routes, the expansion of public transport and more cycle paths, reducing the housing area per person or increasing plant-based diets.

Another part of the relief packages, but also of the coalition contract and the agenda of the Ministry of Economics, are, among others, the increase of renewable energies, increase of energy efficiency and an overall reduction of GHG emissions until 2030 to reach climate neutrality by 2045 (SPD, Die Grünen, FDP 2021; German Ministry of Finances 2022; German Ministry of Economics 2021).

### 2.3.3 France

The energy crisis has also hit France, although the country had a moderate dependency on Russia for its gas supply.

	Gas	Electricity	Wood pellets	Domestic fuel
Price increase	+22%	+7%	+40%	+88%

Table 4. Price increase of the major sources of heating in France between 2021 and 2022<sup>41</sup>

In order to mitigate the impact of surging gas, oil, and electricity prices, France is one of the EU Member States that has subsidised the most its population and businesses with a compensation on energy tariffs costing more than a hundred billion Euros in public spending.

In parallel, a series of defaults in nuclear reactors and the unavailability of others for maintenance have considerably lowered the national electricity production in 2022, leading to concerns over potential shortages and blackouts during the winter season.

<sup>41</sup> Source for gas and electricity: [www.statistiques.developpement-durable.gouv.fr/prix-du-gaz-et-de-lelectricite-au-premier-semester-2022](http://www.statistiques.developpement-durable.gouv.fr/prix-du-gaz-et-de-lelectricite-au-premier-semester-2022) ; source for wood pellets: [www.tucoenergie.fr/blog/evolution-prix-pellet-2022](http://www.tucoenergie.fr/blog/evolution-prix-pellet-2022) ; source for domestic fuel: [www.hel-lowatt.fr/chaudiere/fioul/evolution-prix](http://www.hel-lowatt.fr/chaudiere/fioul/evolution-prix)



All this combined has led the French government to swiftly prepare and publish a National Energy Sufficiency Plan in October 2022, in which all sectors have been urged to contribute by curtailing energy use wherever possible and aiming at a 10% cut. The plan mostly included short-term soft regulation and awareness raising tools, yet the government insisted on the need for sufficiency to be sustained in the longer term for climate mitigation efforts.

An evaluation in February 2023 has revealed that in 6 months the national gas consumption has dropped by about 16%, and the electricity use by about 8% (against previous years). However, no similar trend has been seen for transport fuels. Most of the reduction is assumed to be related to industry and a moderation on heating temperatures in residential and tertiary buildings. Cuts in energy demand have also taken place in municipalities (through extinctions of street lighting, lower temperatures in swimming pools, etc.).

### 2.3.4 Italy

In year 2021, Italy imported 96 % of its gas, 40% of which from Russia<sup>42</sup>, with subsequent international geopolitical tensions. Gas in Italy is widely used both for heating and electricity production: 50% of the electricity in Italy is indeed produced by gas (the highest percentage in Europe, see Figure below).



Figure 2. Share of electricity produce from gas in different European countries<sup>43</sup>

The gas prices, as can be seen from the following graph, have increased dramatically.

<sup>42</sup> <https://greenreport.it/news/energia/il-paradosso-del-gas-importato-dallitalia/#prettyPhoto>

<sup>43</sup> <https://italyforclimate.org/italia-produce-il-50-dellelectricita-da-gas-la-piu-alta-in-ue/>

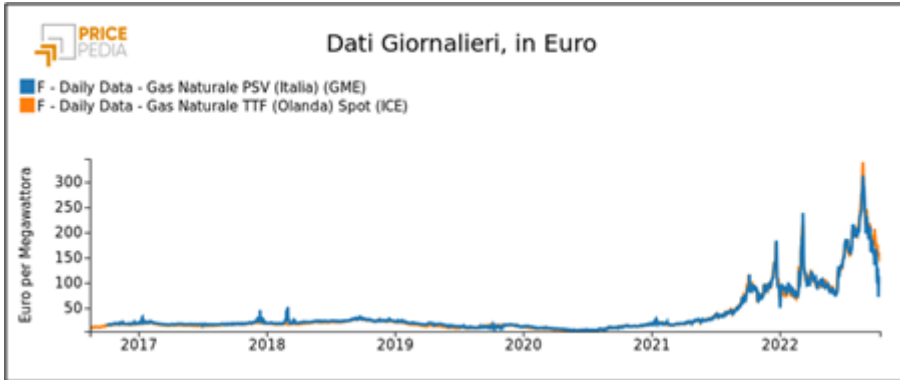


Figure 3. Gas price trends in Italy and the Netherlands, in €/MWh<sup>44</sup>

The increasing price of gas led therefore to spiking of electricity prices as well. With the PUN<sup>45</sup> reaching almost 700 €/kWh, while before the year 2021 it was well below 100 €/kWh (Figure 3).

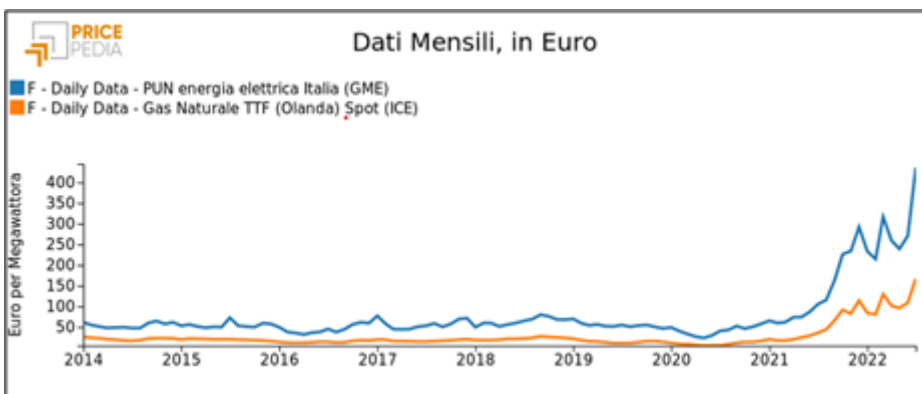


Figure 4. Electricity price trends in Italy and gas (Netherlands), in €/MWh<sup>46</sup>

Italy's higher energy cost burden, as a proportion of total costs incurred, is generalised across all sectors of the economy affecting the primary sector as well as the manufacturing and tertiary sectors<sup>47</sup>.

The response of the Italian spot government to the energy crisis has been developed along three themes:

The first theme is to sustain families and enterprises economically. This set of measures has addressed the problem related to the increasing prices of gas, electricity, and fuels by, among others, dispensing bonus, or grants, reducing VAT and taxes on various energy products, and by providing for the division into instalments of energy bills for domestic and business end customers.

<sup>44</sup> <https://www.pricepedia.it/it/magazine/article/2022/10/15/prezzo-del-gas-al-psv-sotto-i-100-eu-romwh/>

<sup>45</sup> PUN Prezzo Unico Nazionale ("National Single Price") is the wholesale reference price of electricity purchased on the Borsa Elettrica Italiana market (<https://www.enel.it/en/supporto/faq/cos-e-il-pun>)

<sup>46</sup> <https://www.pricepedia.it/it/magazine/article/2022/07/27/schizza-alle-stelle-il-prezzo-del-pun/>

<sup>47</sup> <https://www.confindustria.it/home/centro-studi/temi-di-ricerca/tendenze-delle-imprese-e-dei-sistemi-industriali/dettaglio/impatto-prezzi-energia-sui-costi-di-produzione-settori-a-confronto-italia-francia-germania>



The second theme is to reduce the demand. These measures have been introduced by the *Piano nazionale di contenimento dei consumi di gas naturale* in September 2022<sup>48</sup>. In addition to the initiatives already in place (e.g., tax deductions for building renovations), the national plan entails:

- The modification of the current regulations for winter temperature and switch-on time of heating systems.
- The promotion of behavioural measures that require no cost, such as: ways to reduce energy consumption include taking shorter showers, using electric heat pumps designed for summer air conditioning to provide winter heating, reducing the heat after boiling and shortening the preheating time for ovens, using dishwashers and washing machines only when fully loaded, unplugging washing machines when not in use, turning off or using the low-power function of refrigerators when on vacation, turning off electronic devices such as TVs, set-top boxes, and DVD players instead of leaving them on standby, and reducing the use of light bulbs.
- The promotion of behavioural measures that require an initial investment, such as: investing in replacing higher-consumption appliances with more energy-efficient ones, upgrading air conditioners to more efficient models, installing new electric heat pumps to replace old gas boilers, installing solar thermal panels for hot water production, and switching from traditional light bulbs to LEDs.

The third theme is to ensure the supply of gas to contrast the dependencies from Russia imports. This includes ensuring a high degree of filling of winter storage facilities, and rapidly diversify the origin of imported gas (particularly this latter has led to the recent increase of import from Algeria).

### 2.3.5 Latvia

In Latvia, wholesale natural gas prices jumped from ~50 EUR/MWh in the summer of 2021 to 250 EUR/MWh a year later<sup>49</sup>, wholesale electricity prices increased from 32 EUR/MWh in July of 2021 to almost 500 EUR/MWh two years later<sup>50</sup>. A similar increase can be seen also in the retail energy markets. However, there is a significant variation in the spot prices, e.g., at the end of 2022 electricity hourly prices in the Baltic states varied from 0.09 EUR/MWh to 549.91 EUR/MWh, but the monthly average price dropped to 264 EUR/MWh in December 2022. Diesel and gasoline retail prices have also been going up from 0.9 EUR/l for diesel and 0.98 EUR/l for E-95 in May 2020 to 2.1 EUR/l in June 2022<sup>51</sup>. However, also fuel prices have seen a slight decrease over the last months of 2022. The price of renewables followed the same trend. In September 2022, firewood cost as much as 90 EUR/m<sup>3</sup>, but by December it had already dropped to 55 EUR/m<sup>3</sup>. Briquette and pellet costs have also decreased by roughly 20%. This can be explained by the relatively warm winter and related decrease in demand.

The main topic of political discussions has been the sufficiency of natural gas because the Latvian energy sector depended on imports from the Russian Federation. Thus, the amount of gas necessary for power generation and heating systems during the winter season as well as the changing routes of delivery were the main concerns of the state portrayed by the media. The second key resource was forest biomass – fuel wood, wood chips, and wood pellets – in terms of its price rather than availability. Forest biomass is the main fuel in individual heating systems and a substitute for natural gas in district heating.

<sup>48</sup> National natural gas consumption containment plan [https://www.mase.gov.it/sites/default/files/archivio/comunicati/Piano%20contenimento%20consumi%20gas\\_MITE\\_6set2022\\_agg.pdf](https://www.mase.gov.it/sites/default/files/archivio/comunicati/Piano%20contenimento%20consumi%20gas_MITE_6set2022_agg.pdf)

<sup>49</sup> Households gas prices, band D2, from EUROSTAT (link: [https://ec.europa.eu/eurostat/databrowser/view/NRG\\_PC\\_202\\_custom\\_3407307/default/table](https://ec.europa.eu/eurostat/databrowser/view/NRG_PC_202_custom_3407307/default/table))

<sup>50</sup> Households electricity prices, band DC, from EUROSTAT (link: [https://ec.europa.eu/eurostat/databrowser/view/NRG\\_PC\\_204\\_custom\\_3372694/default/table](https://ec.europa.eu/eurostat/databrowser/view/NRG_PC_204_custom_3372694/default/table))

<sup>51</sup> <https://www.fuel-prices.eu/fossil-fuels-price-chart/Latvia/>





As a result of increasing energy costs and in response to geopolitical tensions we can see a significant increase in the public interest in energy efficiency and local renewable energy solutions. On the other hand, we do not see collective action such as protests and the ignition of social movements to be induced by increasing energy prices. But at the same time, social dialogue has grown. The war in Ukraine has contributed to a growing sense of national unity.

Due to the high energy prices and inflation, the government prepared several support measures for households, organizations, and enterprises. The measures for households included a price cap for district heating and compensations for the purchase of fuelwood. These support programs to compensate for energy price increases implemented at the national level to a certain extent diminish the negative effects of energy price increases. Regarding households, support is provided for all types of energy consumption – electricity (fixed price for 100 kWh/month), natural gas, solid biomass use in heating, as well as district heating. In addition to that, the monthly benefit is granted to seniors, persons with disabilities, persons who have lost their breadwinners, and the threshold of the guaranteed minimum income for the calculation of the amount of the housing benefit has also been raised. However, most of these support schemes are not progressive and do not encourage energy conservation. And even more, for some households, the costs of energy have even decreased as a result of the significant government support.

The main innovation was the integration of remote work and working time flexibility in property management strategies. This led to the replanning of building occupancy and heating schedules for public buildings such as ministries, universities, town councils, or state services. The public and private energy-saving measures resulted in a decrease in natural gas and power consumption.

### 2.3.6 India

India did not set up any specific plan to respond to the periodical energy crisis unlike the European countries, as it did not undergo an energy crisis like Europe did in 2022-2023, which was catalyzed by the war on Ukraine.

## 2.4 Cross-country comparison

In most countries, the direct translation of the word sufficiency has no direct link to environmental sustainability and is not well known or used. However, the link becomes obvious when it is associated with terms such as "energy" or "environmental" sufficiency. In this context, the concept sometimes conveys political ideas: criticized as a "lack" in relation to Western European welfare associated with increased consumption in Latvia, symbolizing resistance to colonial conceptions of "development" (green, sustainable or otherwise) in India. In Germany, Italy, Denmark and France, it is becoming more present in public debates, although still mainly used by specialized circles working specifically on energy sufficiency.

Overall, we see in interviews from all countries that the term "sufficiency" is more closely linked to the environment and the ecological transition by participants in the intentional communities. For those in the panel, it refers more to something unfulfilling and/or related to austerity. The commonly used term in the national language in France and Italy, *sobriété* or *sobrietà*, bears negative stereotypes although in the case of France, respondents from the low-income panels have rather reacted positively to the concept.

In Latvia and to a lesser extent in Germany, the Soviet legacy and neoliberal restructuring of the economy in the 1990s that instilled an individualistic spirit, hindering initiatives that invoke a broader sharing of resources such as co-ownership or cohabitation. Quite contrarily, however, some Eastern Germans participating in the sufficiency-oriented initiatives have referred to growing up in the GDR as a reason for their current behaviours:

*"In the GDR it was perfectly normal to help each other out. If one person had too much, that person shared it"*

(woman, 58, Germany)



It does not seem to be the case in Latvia, where people are mostly copying sufficiency initiatives from the West, e.g., freecycling, eco-villages.

In common for European countries, we find the traces left by the oil crisis and the energy saving campaigns of the 1970s. Also common are the rising energy prices for countries that depend on imports from the Russian Federation and a significant increase in public interest in energy efficiency and local renewable energy solutions. The war in Ukraine has also contributed to a growing sense of national unity on these issues. The support measures for the current energy crisis are similar in these countries: price caps, compensation or financial aid, energy tax reductions, temperature reduction in public buildings, and information campaigns on energy saving. Most of these support schemes are not progressive and do not encourage energy savings: they mainly provide relief without directly addressing the reduction of energy consumption, which is mainly left to households that cannot afford energy services due to rising energy prices.

The differences are related to the specificities of the available resources and energy supply of the countries (no coal in Denmark but in Germany, no nuclear in Germany and Denmark but in France, neither in Italy) to the existing heating networks and to cultural and climatic factors. Denmark stands out with less influence of rising energy costs related to its district heating network (CHP and waste) or relatively high taxes on electricity, gas and products which reduced the relative effect of price increases and had discouraged electric heating. Germany appears to be the only country to have implemented mobility fee reductions for all public transport.

In India, policy debates related to limits to growth are largely fixed on the international geopolitical dimensions of equity discourse, for example at the level of the United Nations climate negotiations but absent from discourses of "national" or intra-national equity, and energy use is profoundly inequitable across social classes. Within the affluent class, there is ambivalence about compromising current lifestyles to reduce their carbon footprint.



## 3 Macrosocial determinants of sufficient lifestyles

This section uses the quantitatively estimated carbon footprint<sup>52</sup> and well-being index described in D3.1 to identify sufficiency-oriented lifestyles in each country<sup>53</sup>.

The following section provides an overview of the methodology and describes the groups in Denmark, Germany, Italy, and Latvia using socio-economic factors and quality of life. Section 5.1.2 describes the methodology and the groups in France where the categories had to be applied in a different way as the well-being measure was not available. Econometric methods are then used to identify factors that are associated with belonging in each group.

### 3.1 Lifestyle groups

#### 3.1.1 Group building methodology in Denmark, Germany, Italy, and Latvia

We operationalise a sufficiency-oriented lifestyle as a lifestyle with low-carbon footprint in all four activities (electricity, diet, heating and hot water, and transport) and a high score on the well-being index. Since we are mainly interested in individuals with sufficiency-oriented lifestyle, our focus will be on individuals with a lower carbon footprint. Individuals with average and high carbon footprints will be divided into groups and used as comparison groups.

We did not include CO<sub>2eq</sub>-emissions related to aviation in the transport carbon footprint due to the probable bias caused by the COVID-19 pandemic.

Due to an error in the survey, we were not able to calculate the well-being index for respondents from France. This section will thus focus on Denmark, Germany, Italy, and Latvia.

Our methodology for identifying the groups is summarised in Figure 1. For each country:

1. we use the following two criteria to categorise respondents; carbon footprint and well-being
2. we distinguish quartiles of carbon footprint for total carbon footprint and individual activities (heating, electricity, transport, diet)
3. we distinguish above and below median-well being

Based on the previous steps, we create the following five groups:

**Group I - Very Sufficient:** above median well-being and carbon footprint in lowest quartile for all activities.

**Group II - Sufficient:** above median well-being, total carbon footprint in lowest quartile & above second quartile footprint for at least one activity.

**Group III - Low Carbon Footprint, Low Well-Being:** below the median total carbon footprint and below the median well-being.

**Group IV - Average Carbon Footprint:** total carbon footprint between second and third quartile.

**Group V - High Carbon Footprint:** total carbon footprint in the fourth quartile.

32 extreme outliers<sup>54</sup> and individuals who did not provide responses to at least one question on the well-being index (N=245) were also removed.

<sup>52</sup> Standard global warming factors are used to make CO<sub>2</sub> and methane emissions comparable, expressing emissions in terms of CO<sub>2eq</sub>.

<sup>53</sup> See Carbon calculator summary in Deliverable 3.1.

<sup>54</sup> Heating and hot water carbon footprint > 30000kg CO<sub>2eq</sub>-emissions and transport carbon footprint > 20000kg CO<sub>2eq</sub>-emissions, N=32



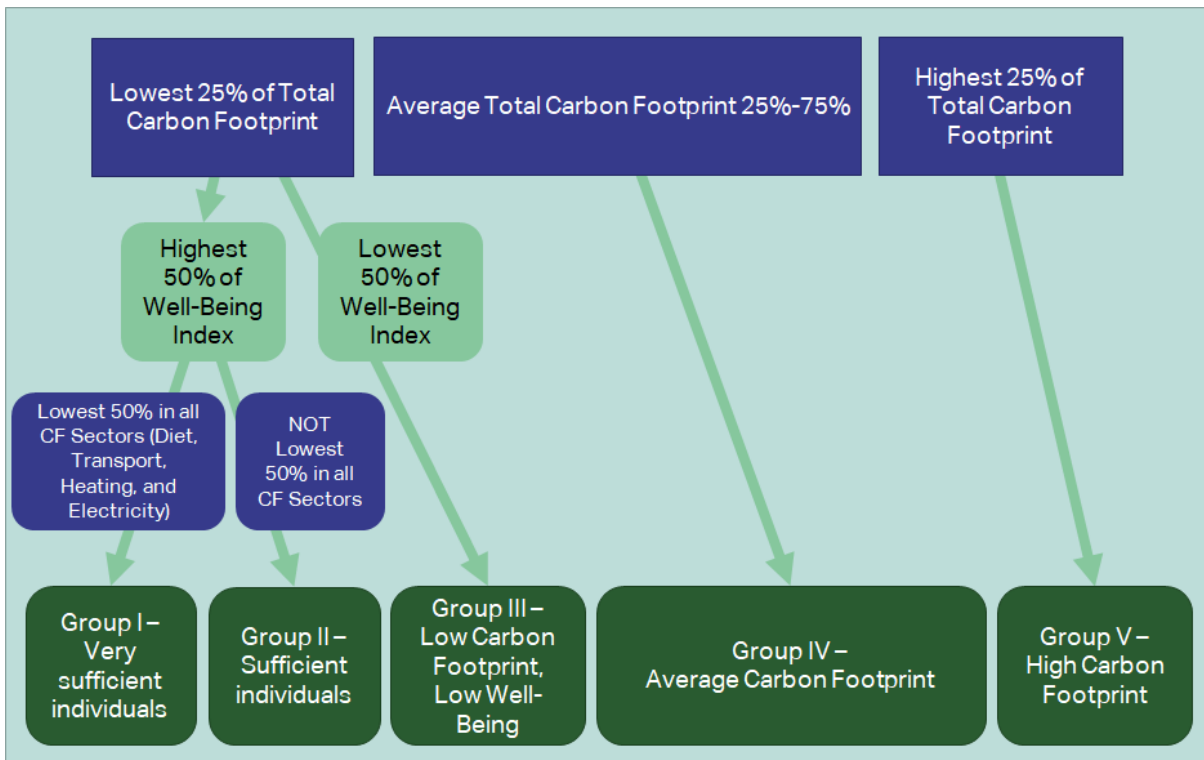


Figure 5. Group identification operationalisation for each country

### 3.1.2 Group building in France

Since the responses from France could not be classified using the well-being index<sup>55</sup>, we classify respondents by distinguishing quartiles of their carbon footprint for total carbon footprint and for individual activities (heating, electricity, transport, diet)

We then create the following four groups:

**Group A - Low Carbon Footprint in all Activities:** carbon footprint in lowest quartile for all activities.

**Group B - Low Carbon Footprint:** total carbon footprint in lowest quartile & above second quartile footprint for at least one activity.

**Group IV - Average Carbon Footprint:** total carbon footprint between second and third quartile.

**Group V - High Carbon Footprint:** total carbon footprint in fourth quartile

### 3.1.3 Econometric analysis methodology

To relate category membership to socio-demographic and additional variables, we estimate multinomial log-linear models via neural networks<sup>56</sup>. Because the coefficients of the models have no intuitive meaning, the results are reported in terms of average marginal effects and - for dichotomous variables - discrete probability effects, i.e. the change in the probability in belonging to a particular group in response to a one unit change in the covariate<sup>57</sup>. Because probabilities must add up to one, the marginal effects add up to zero. The interpretation of all findings implies the *ceteris paribus* condition.

<sup>55</sup> For more information, see T. 3.1.

<sup>56</sup> For more information, see Venables and Ripley 2010

<sup>57</sup> For completeness, we report the coefficients of the multinomial logit model in Appendix 3.



For each country, we calculated a separate model including covariates relating to sufficiency orientation, environmental identity, deprivation, policy orientation, and socio-demographic characteristics.

In order to test our hypotheses related to care work and number of hours spent working, two additional models were calculated for each country. The first consisted of a care model that only included respondents from households in which at least 2 adults live and, in addition to the covariates in the general model, also included covariates related to care work. The second additional model only included respondents who stated that they were employed or self-employed, and included an additional covariate covering the number of hours worked per week. These two additional models did not yield relevant insights and thus have not been included in this deliverable.

### 3.1.4 Respondents' distribution between the groups

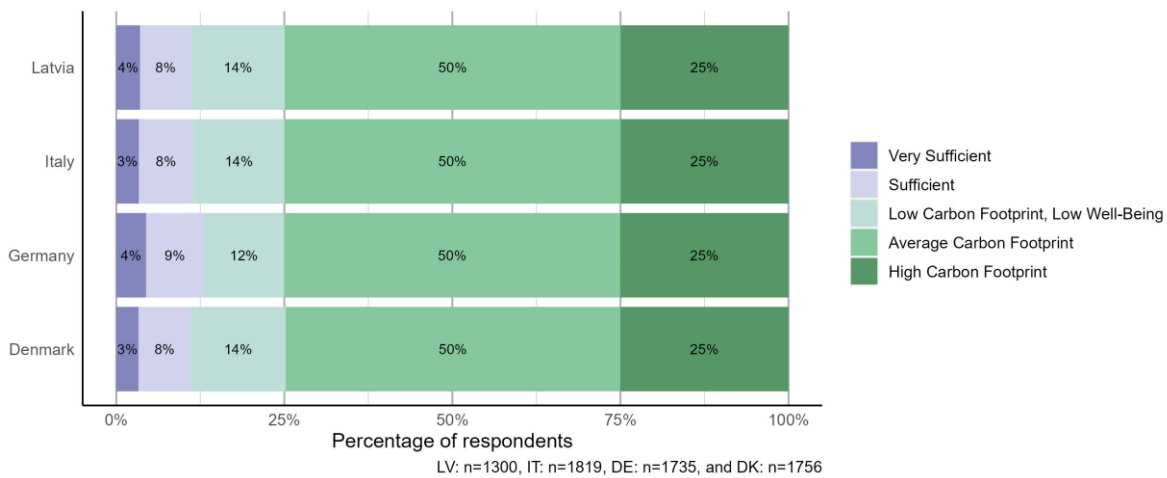


Figure 6. Distribution of participants between groups in Denmark, Germany, Italy, and Latvia

Figure 5 depicts the distribution of survey participants in the groups by country. In line with the categorisation, 50% of individuals in each country are in *Group III - Average Carbon Footprint*, and a quarter are in *Group V - High Carbon Footprint*. The distribution of respondents in the low carbon footprint groups (*Groups I to III*) is similar between countries, with between 3 and 4% of respondents in *Group I - Very Sufficient*, 7 to 8% in *Group II - Sufficient*, and 13-15% in *Group III - Low Carbon Footprint, Low Well-Being*.

Figure 6 depicts the distribution of survey participants in the groups in France. As expected, 50% of individuals are in *Group III - Average Carbon Footprint*, and a quarter are in *Group V - High Carbon Footprint*. Regarding the two low carbon footprint groups, 8% are in *Group A - Low Carbon Footprint in all Activities* and 17% are in *Group B - Low Carbon Footprint*.

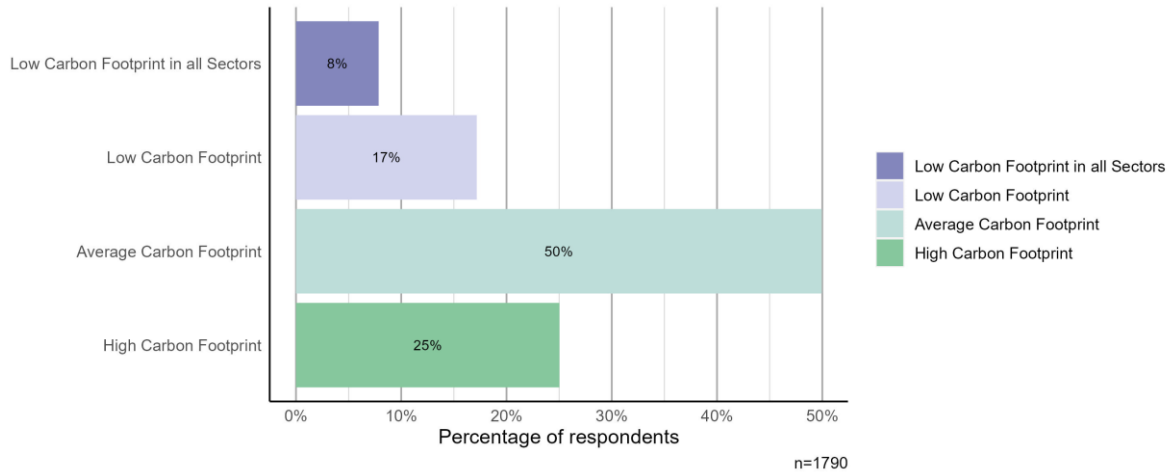


Figure 7. Distribution of participants between groups in France

## 3.2 Results of the econometric analysis

The following section presents the results of the econometric analysis. A complete description of the covariates used in the analysis can be found in Appendix 2. For each country, we display the summary tables of the model and subsequently, we describe the results for each group.

### 3.2.1 Germany

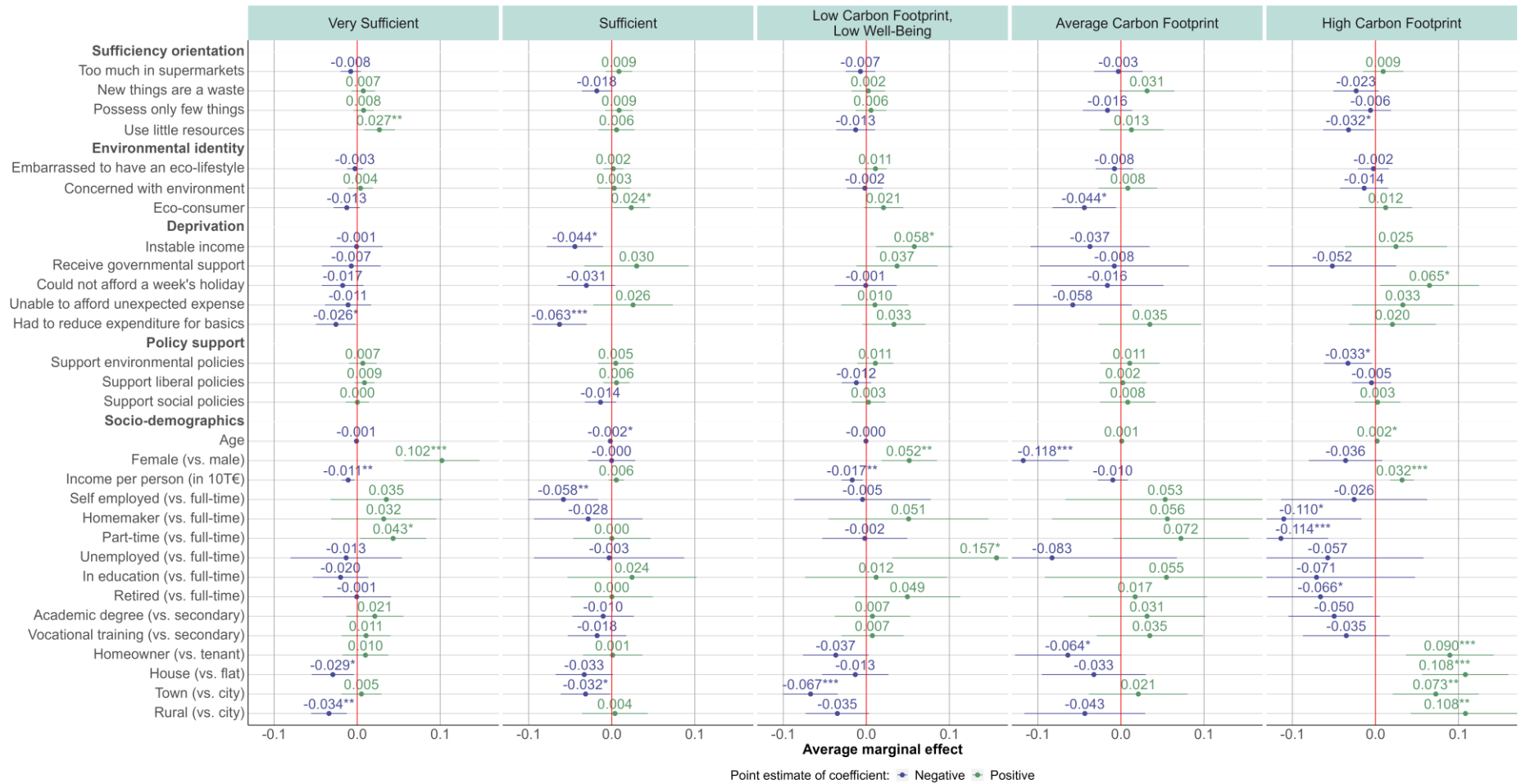


Figure 8. Results of the general model for Germany: Average marginal and discrete probability effects



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	The respondents who have the following characteristics are <b>more</b> likely to be in this group:	The respondents who have the following characteristics are <b>less</b> likely to be in this group
<b>Group I</b> <b>Very Sufficient</b>	<p>Are female rather than male (10.2%-points).</p> <p>Work part-time rather than full-time (4.3%-points).</p> <p>State that they try to use little resources.</p> <p>Live in a flat rather than a house (2.9%-points).</p> <p>Live in a city rather than in a rural area (3.4%-points).</p>	<p>Had to reduce expenditure for basics (2.6%-points).</p> <p>Have a higher income (1.1%-points for each increase of the respondent's annual income by 10,000€).</p> <p>Live in rural areas rather than in a city (3.4%-points).</p>
<b>Group II</b> <b>Sufficient</b>	<p>Female rather than male (5.2%-points).</p> <p>Consider themselves to be an ecoconsumer.</p>	<p>Have an instable income (4.4%-points).</p> <p>Had to reduce expenditure for basics (6.3%-points).</p> <p>Are older (0.2%-points for each increase of the respondent's age by one year).</p> <p>Are self-employed rather than working full-time (5.8%-points).</p> <p>Live in a town or in suburbs rather than in a city (3.2%-points).</p>
<b>Group III</b> <b>Low Carbon Footprint, Low Well-Being</b>	<p>Have an instable income (5.8%-points).</p> <p>Are unemployed rather than working full-time (15.7%-points).</p>	<p>Have a higher income (1.7%-points for each increase of the respondent's annual income by 10,000€).</p> <p>Live in a town or in suburbs rather than in a city (6.7%-points).</p>
<b>Group IV</b> <b>Average Carbon Footprint</b>	<p>Are male rather than female (11.8%-points).</p>	<p>Are homeowners rather than tenants (6.4%-points).</p> <p>Consider themselves to be an ecoconsumer.</p>
<b>Group V</b> <b>High Carbon Footprint</b>	<p>Have a higher income (3.2%-points for each increase of the respondent's annual income by 10,000€).</p> <p>Are homeowners rather than tenants (9%-points).</p> <p>Live in a house rather than a flat (10.8%-points)</p> <p>Live in a town (7.3%-points) or a rural area (10.8%-points) rather than a city.</p> <p>Could not afford a week's holiday.</p> <p>Are older.</p>	<p>Try to use little resources.</p> <p>Support environmental policies.</p> <p>Are homemakers, work part-time or are retired rather than working full-time.</p>



### 3.2.2 Denmark

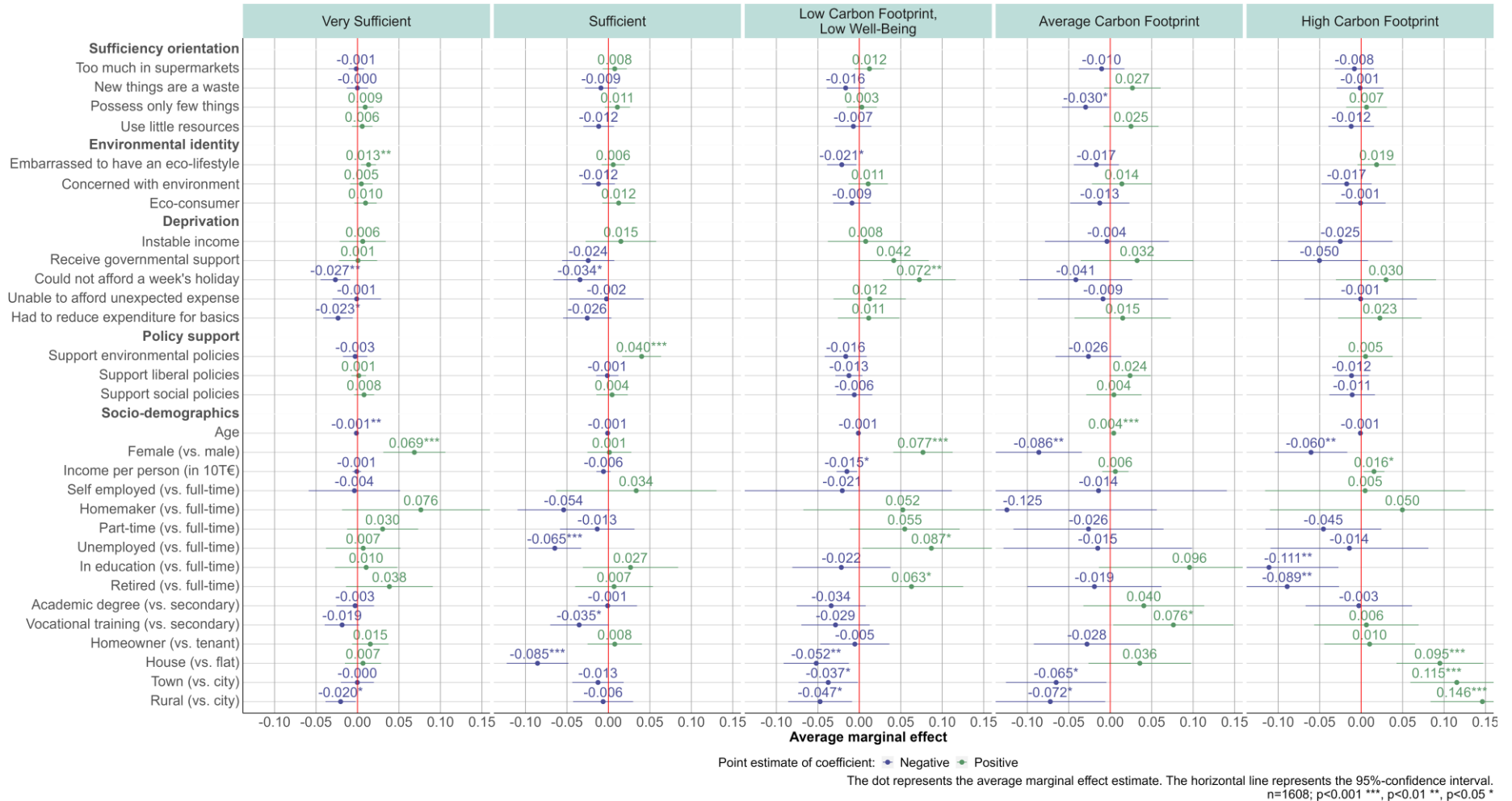


Figure 9. Results of the general model for Denmark: average marginal and discrete probability effects



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	The respondents who have the following characteristics are <b>more</b> likely to be in this group:	The respondents who have the following characteristics are <b>less</b> likely to be in this group
<b>Group I Very Sufficient</b>	<p>Are female rather than male (6.9%-points).</p> <p>Are embarrassed to have an eco-lifestyle.</p>	<p>Had to reduce expenditure for basics (2.3%-points).</p> <p>Could not afford a week's holiday (2.7%-points).</p> <p>Are older (0.1%-points for each increase of the respondent's age by one year).</p> <p>Live in rural areas rather than in a city (2.0%-points).</p>
<b>Group II Sufficient</b>	<p>Support environmental policies (4%-points).</p> <p>Live in a flat rather than in a house (8.5%-points).</p>	<p>Are unemployed rather than working full-time (6.5%-points).</p> <p>Could not afford a week's holiday (3.4%-points).</p> <p>Have a vocational training rather than secondary education-level (3.5%-points).</p>
<b>Group III Low Carbon Footprint, Low Well-Being</b>	<p>Are female rather than male (7.7%-points).</p> <p>Could not afford a week's holiday (7.2%-points).</p> <p>Are unemployed (8.7%-points) or retired (6.3%-points) rather than working full-time.</p> <p>Live in a flat rather than in a house (5.2%-points).</p> <p>Live in a city rather than a town (3.7%-points) or a rural area (4.7%-points).</p> <p>Are embarrassed to have an eco-lifestyle.</p>	<p>Have a higher income (1.5%-points for each increase of the respondent's annual income by 10,000€).</p>
<b>Group IV Average Carbon Footprint</b>	<p>Are male rather than female (8.6%-points).</p> <p>Are older (0.4%-points for each increase of the respondent's age by one year).</p> <p>Live in a city rather than a town (6.5%-points) or a rural area (7.2%-points).</p>	<p>Try to possess only few things.</p>
<b>Group V High Carbon Footprint</b>	<p>Are male rather than female (6%-points).</p> <p>Have a higher income (1.6%-points for each increase of the respondent's annual income by 10,000€).</p>	<p>Are in education rather than working full-time (11.1%-points).</p> <p>Are retired rather than working full-time (8.9%-points).</p>



	<p>Live in a house rather than a flat (9.5%-points).</p> <p>Live in a town or a rural area rather than a city (11.5%-points).</p>	
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### 3.2.3 Italy

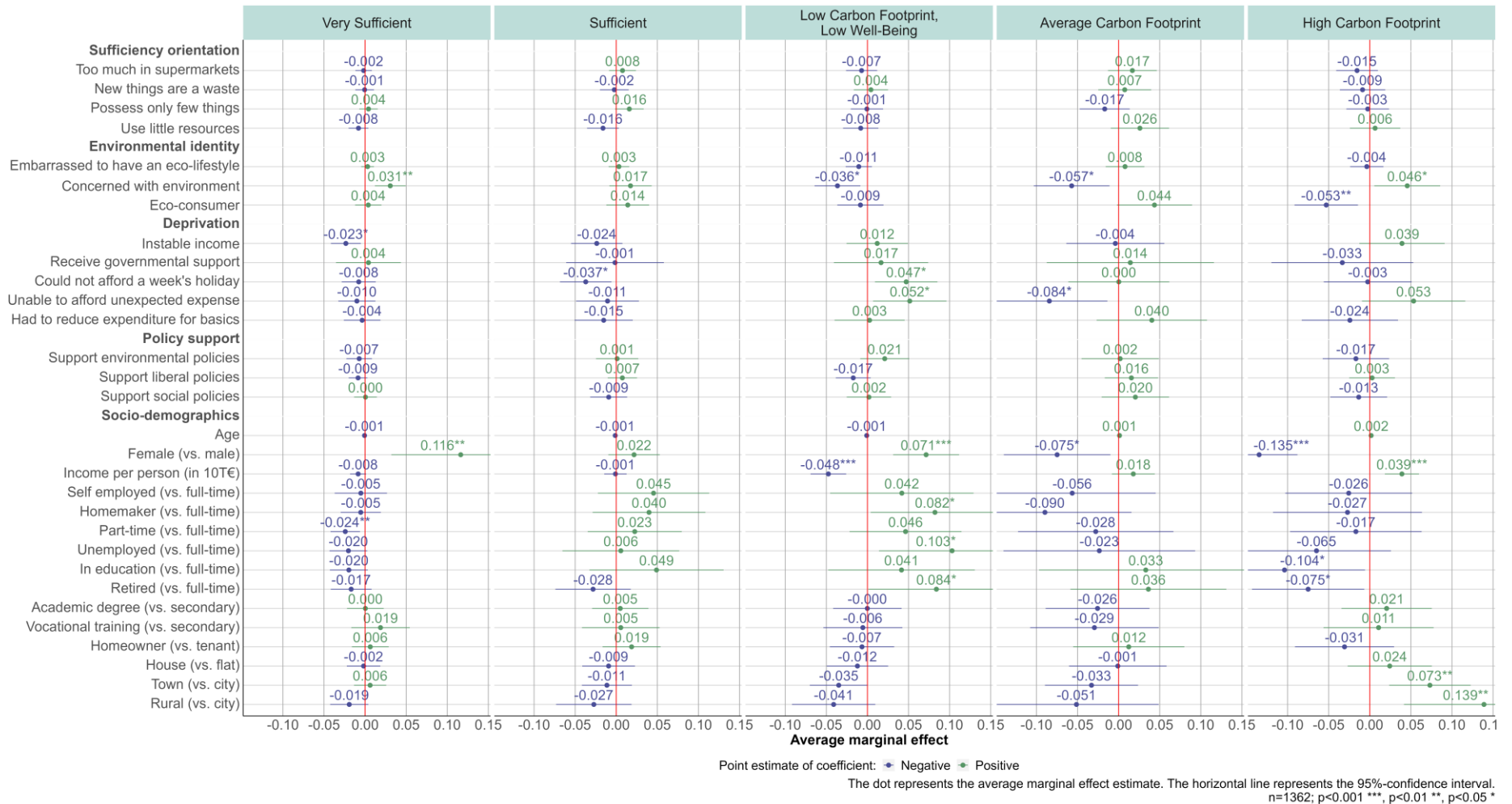


Figure 10. Results of the general model for Italy: average marginal and discrete probability effects



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	The respondents who have the following characteristics are <b>more</b> likely to be in this group:	The respondents who have the following characteristics are <b>less</b> likely to be in this group
<b>Group I Very Sufficient</b>	Are female rather than male (11.6%-points). Are concerned about the environment.	Have unstable income (2.3%-points). Work part-time rather than full-time (2.4%-points).
<b>Group II Sufficient</b>		Could not afford a week's holiday (3.7%-points).
<b>Group III Low Carbon Footprint, Low Well-Being</b>	Are female rather than male (7.1%-points). Could not afford a week's holiday (4.7%-points). Were unable to afford an unexpected expense (5.2%-points). Are a homemaker (8.2%-points), unemployed (10.3%-points), or retired (8.4%-points) rather than working full-time.	Have a higher income (4.8%-points for each increase of the respondent's annual income by 10,000€). Are concerned about the environment.
<b>Group IV Average Carbon Footprint</b>	Are male rather than female (8.4%-points).	Are concerned about the environment. Were unable to afford unexpected expenses (8.4%-points).
<b>Group V High Carbon Footprint</b>	Are male rather than female (13.5%-points). Have a higher income (3.9%-points for each increase of the respondent's annual income by 10,000€). Live in a house rather than a flat (10.8%-points). Are concerned about the environment. Live in a town (7.3%-points) or a rural area (13.9%-points) than in a city.	Consider themselves to be an eco-consumer. Are in education (10.4%-points) or retired (7.4%-points) rather than working full-time.

### 3.2.4 Latvia



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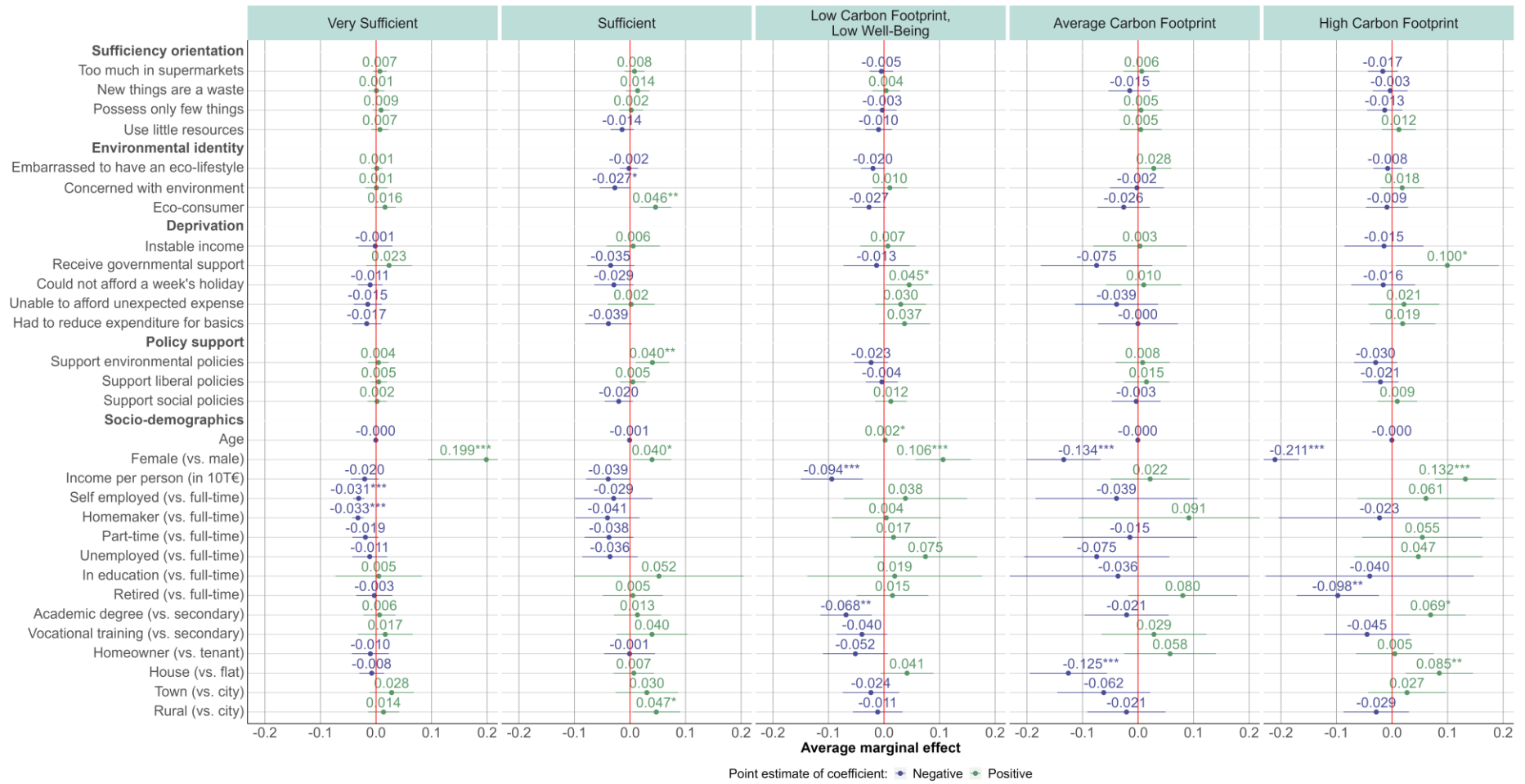


Figure 11. Results of the general model for Latvia: average marginal and discrete probability effects

n=1067; p<0.001 \*\*\*, p<0.01 \*\*, p<0.05 \*



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	The respondents who have the following characteristics are <b>more</b> likely to be in this group:	The respondents who have the following characteristics are <b>less</b> likely to be in this group
<b>Group I</b> <b>Very Sufficient</b>	Are female rather than male (19.9%-points).	Are self-employed (3.1%-points) or a homemaker (3.3%-points) rather than working full-time.
<b>Group II</b> <b>Sufficient</b>	Are female rather than male (4%-points) Are concerned about the environment. Consider themselves to be an eco-consumer. Support environmental policies. Live in a rural area rather than a city (4.7%-points).	
<b>Group III</b> <b>Low Carbon Footprint, Low Well-Being</b>	Are female rather than male (10.6%-points). Could not afford a week's holiday (4.5%-points). Are older (0.2%-points for each increase of the respondent's age by one year).	Have a higher income (9.4%-points for each increase of the respondent's annual income by 10,000€). Have an academic rather than secondary-level education (6.8%-points).
<b>Group IV</b> <b>Average Carbon Footprint</b>	Are male rather than female (13.4%-points). Live in a flat rather than a house (12.5%-points).	
<b>Group V</b> <b>High Carbon Footprint</b>	Are male rather than female (21.1%-points). Have a higher income (13.2%-points for each increase of the respondent's annual income by 10,000€). Receive governmental support (10%-points).	Are retired rather than working full-time (9.8%-points).

### 3.2.5 France



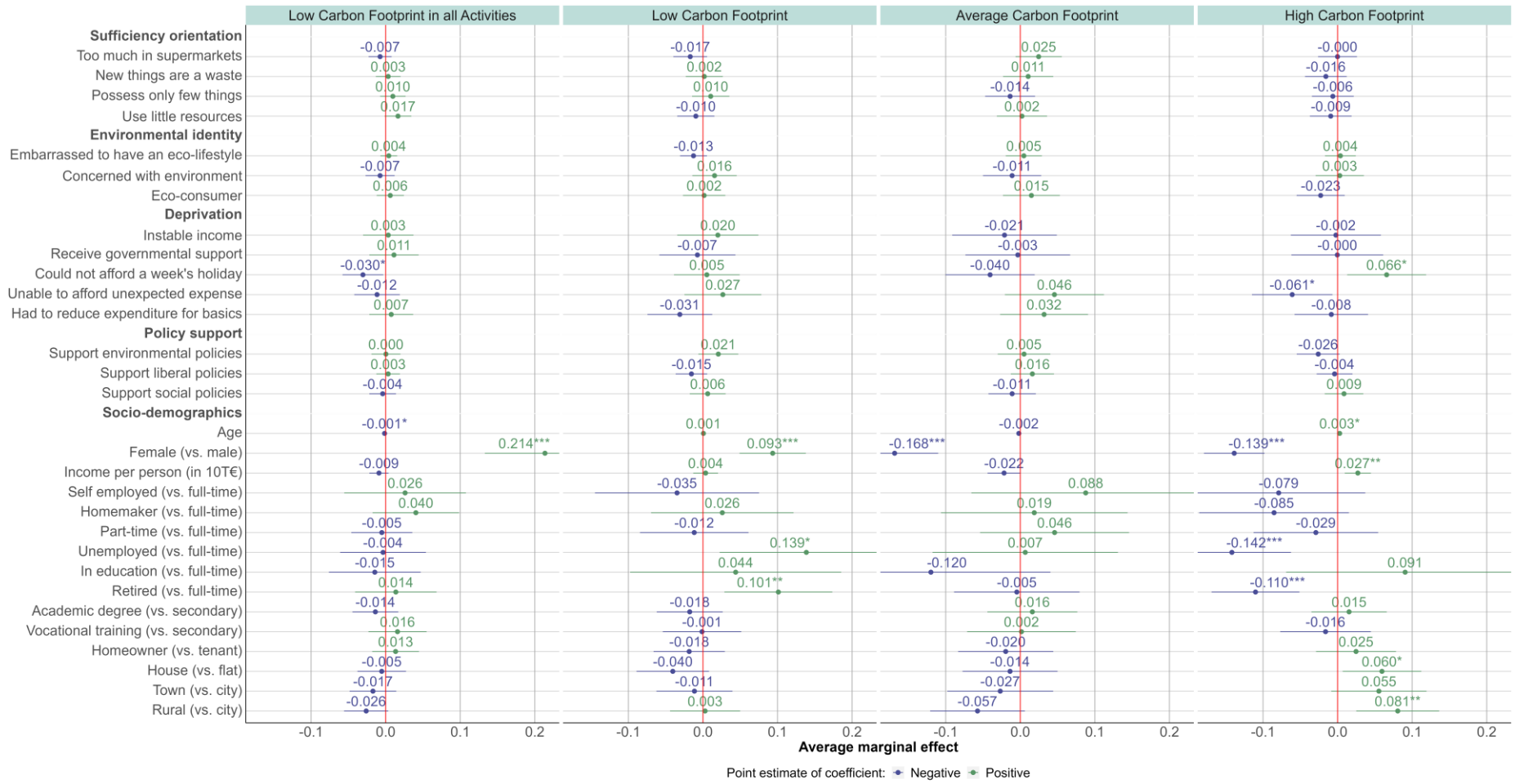


Figure 12. Results of the general model for France: average marginal and discrete probability effects



FULFILL has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101003656.

	The respondents who have the following characteristics are <b>more</b> likely to be in this group:	The respondents who have the following characteristics are <b>less</b> likely to be in this group
<b>Group A</b> <b>Low Carbon Footprint in all Activities</b>	Are female rather than male (21.4%-points).	Could not afford a week's holiday (3%-points). Are older (0.1%-points for each increase of the respondent's age by one year).
<b>Group B</b> <b>Low Carbon Footprint</b>	Are female rather than male (9.3%-points) Are unemployed (13.9%-points) or retired (10.1%-points) rather than working full-time.	
<b>Group C</b> <b>Average Carbon Footprint</b>	Are male rather than female (16.8%-points).	
<b>Group D</b> <b>High Carbon Footprint</b>	Are male rather than female (13.9%-points). Are older (0.3%-points for each increase of the respondent's age by one year). Have a higher income (2.7%-points for each increase of the respondent's annual income by 10,000€). Live in a house rather than in a flat (6%-points). Live in a rural area rather than in a city (8.1%-points). Could not afford a week's holiday (6.6%-points).	Were unable to afford an unexpected expense (6.1%-points less likely). Are unemployed (14.2%-points) or retired (11%-points) rather than working full-time.



### 3.3 Cross-country comparison

The following section compares the results of the multinomial models between the five countries; Germany, Denmark, Italy, Latvia, and France. It compares whether respondents are more likely to be in one sufficiency group than in another using various demographic and socio-economic characteristics. For this analysis, we consider a correlation to be significant when  $p < 0.05$ .

#### 3.3.1 Gender

Gender is an important dimension of sufficiency in all countries. Females are more likely to be in the very sufficient group by 10%-points in Germany, 7%-points in Denmark, 12%-points in Italy, and 20%-points in Latvia. In France, females are more likely to be in the low-carbon footprint in all activities group by 21%-points. They are also more likely to be in the sufficient group in Latvia (4%-points) and in the low-carbon footprint category in France by 9%-points.

However, females are also more likely to be in the Low carbon footprint, Low wellbeing group by 5%-points in Germany, 8%-points in Denmark, 7%-points in Italy, and 11%-points in Latvia. Conversely, in all countries but Germany, males are more likely to be in the high carbon footprint: by 6%-points in Denmark, 14%-points in Italy, 21%-points in Latvia and 14%-points in France.

These results indicate that, overall, females have a lower carbon footprint than males. Which indicates that females either consume less energy or use technologies with fewer emissions than males. These results are not surprising as the mean carbon footprint for nutrition, space heating and hot water, and transport is lower for women than for men in each country. Regarding the electricity carbon footprint, in France, Italy and Latvia the mean is lower for women than men, and lower for men rather than women in Germany and Denmark. Overall, these findings thus support the hypothesis that women consume less energy than men; more specifically, they tend to travel less than men and to eat less meat than men<sup>58</sup>.

#### 3.3.2 Affluence

Affluence, measured through both direct and indirect variables, is the second most important factor in all countries. For each increase of the respondent's income by 10,000€, the probability to be in the High carbon footprint increases by 1.6% in Denmark, 2.7% in France, 3.2% in Germany, 4% in Italy, and 13% in Latvia. One hypothesis that could be formulated to explain the difference in intensity between countries is that it reflects the importance of income inequalities in the different countries. Indeed, the ranking of the countries with regard to the importance of the influence of income on carbon footprints follows the differences in Gini index<sup>59</sup> in those countries (see table below). Statistically, there seem to be a link between the variation of carbon footprints and the variation of incomes, but a sample of five countries is too low to confirm this.

Country	Gini index in 2021
Denmark	27
France	29,3
Germany	30,9
Italy	32,9
Latvia	35,7

Table 5. Gini index in the five countries, 2021 (Source: EUROSTAT)

<sup>58</sup> In addition to this, the calculation of the carbon footprint is influenced by the assumption in the carbon footprint calculator that women consume fewer calories than men. Thus, for the same diet, women are more likely to have a lower nutrition-related carbon footprint.

<sup>59</sup> The Gini Index (or coefficient) is a synthetic indicator that captures the level of inequality for a given variable and population. A higher index indicates greater inequalities (Source: INSEE)



Reversely, lower levels of income are correlated with lower carbon footprints and lower levels of wellbeing in all countries - with the exception of France, where no wellbeing index is available. For each increase of the respondent's income by 10,000€, the probability that the respondent is in the *Low Carbon Footprint, Low Wellbeing* group decreases by 1.7%-points in Germany, 1.5%-points in Denmark, 4.8%-points in Italy and 9.4%-points in Latvia. Germany is the only country where the probability that the respondent is in the *Very Sufficient* group decreases with income. The relationship is not significant (at  $p < 0.05$ ) in the other countries. Direct levels of income are not correlated with lower carbon footprint in France.

Diverse indirect measures of affluence have also been found to have significant coefficient estimates in the models of the five countries. Respondents who could not afford a week's holiday are 4.5%-points more likely to be in the *Low Carbon Footprint, Low Well-Being* group in Latvia, 4.7%-points in Italy, and 7.2%-points in Denmark. However, in Denmark, they are also less likely to be in the *Very Sufficient* group (2.7%-points) and in the *Sufficient* group (3.4%-points), indicating a relationship between this variable and wellbeing. This is also the case in Italy, where respondents who could not afford a week's holiday are 3.7%-points less likely to be in the *Sufficient* group.

More surprisingly, respondents who could not afford a week's holiday are 3%-points less likely to be in the *Low Carbon footprint in all activities* group in France, and 6.6%-point more likely to be in the *High Carbon footprint* group. They are also more likely to be in the *High Carbon footprint* group in Germany. This rather counter-intuitive result may indicate that some people have understood affordability timewise, or that some people with high carbon footprints have high energy expenses that they cannot reduce (for example, high work-related mobility, poorly insulated homes...). They may hence have had to cut off on other expenses, typically holidays. This possible explanation tends to be supported by the fact that in France, respondents who were unable to afford a week's holiday are 6.6%-points more likely to be in the *High Carbon Footprint* group. A similar result appears in Latvia, where respondents who receive governmental support are 10%-points more likely to be in the *High Carbon Footprint* group. This tends to indicate that among the high emitters, there could be a sub-group of relatively poorer respondents who suffer from, rather than choose, high energy use and therefore expenses (e.g., energy inefficient housing leading to higher heating costs).

Other indirect measures of affluence indicate that the economic stress is negatively correlated with being in the sufficiency groups, and positively correlated with being in the *Low carbon footprint, low wellbeing* group. Respondents who had to reduce expenditure for basics are 2.6%-points less likely to be in the *Very sufficient* group in Germany, and by 2.3%-points in Denmark. They are also less likely to be in the *Sufficient* group in Germany (6.3%-points). Respondents who have an instable income are 4.4%-points less likely to be in the *Sufficient* group in Germany, and 2.3%-points less likely to be in the *Very sufficient* group in Italy. Respondents who have an instable income are 5.8%-points more likely to be in the *Low Carbon Footprint, Low Well-Being* group in Germany, and respondents who were unable to afford an unexpected expense are 5.2%-points more likely to be in the *Low Carbon Footprint, Low Well-Being* group in Italy.

### 3.3.3 Age

Age appears as a relevant variable in four out of the five countries. In Germany, Denmark and France, older ages are associated with higher carbon footprints<sup>60</sup>.

In Latvia, on the contrary, as the age of the respondent increases by one year, the probability that the respondent is in the *Low Carbon Footprint, Low Well-Being* group increases by 0.2%-points.

In Germany, the probability that the respondent is in the *Sufficient* group decreases with age, which is also the case for the *Very Sufficient* group in Denmark and the *Low Carbon Footprint in*

<sup>60</sup> Despite that the nutrition carbon footprint assumes that as individuals age, they consume fewer calories.





*all Activities* in France. Conversely, as the age of the respondent increases by one year, the probability that the respondent is in the *Average Carbon Footprint* group increases in Denmark, and the probability that the respondent is in the *High Carbon Footprint* group increases in France.

This indicates the existence of intergenerational inequalities regarding the carbon footprint, which could be due to a number of different explanations (increase in leisure travel, different level of comfort, more traditional high meat diets...), except in Latvia where older individuals have lower carbon footprints. This finding confirms other studies about the socio-demographic determinants of carbon footprints in Latvia (e.g. Brizga et al., 2017). It reflects the trends in poverty in the country (Ebbinghaus, 2021), and the tendency for older people to be less mobile (Brizga et al., 2017).

### 3.3.4. Occupational status

Part-time work and/or so-called “inactivity” compared to working full-time seem to be positively correlated with lower carbon footprints in all countries.

However, the relationship with sufficiency and wellbeing is not the same in all countries. In Germany, respondents who work part-time rather than full-time are more likely to be in the *Very Sufficient* group, and respondents who are homemakers, who work part-time and who are retired are less likely to be in the *High Carbon Footprint* group compared to respondents who work full-time. Working part-time rather than full-time is thus associated with both lower carbon footprint, and higher levels of wellbeing. In Latvia, France, Italy and Denmark, respondents who are retired are also less likely to be in the *High Carbon Footprint* group compared to respondents who work full-time, thus indicating a relationship with the carbon footprint, but not with sufficiency.

In Denmark, respondents who are retired are more likely to be in the *Low Carbon Footprint, Low Well-Being* group compared to respondents who work full-time. Respondents who are a homemaker, unemployed or retired are also more likely to be in the *Low Carbon Footprint, Low Well-Being* group in Italy. In these cases, “inactivity” is associated with lower carbon footprint, but also lower wellbeing. Unemployed and retired individuals are also more likely to be in the *Low Carbon Footprint* group compared to individuals working full-time in France.

### 3.3.4 Education

Education does not seem to be an important factor in the five models, with few significant correlations between highest education level and *Sufficiency group*<sup>61</sup>, except for Denmark and Latvia. In Denmark, respondents who have a vocational training are less likely to be in the *Sufficient* group compared to respondents who have a secondary education-level or an academic degree; and respondents who have a vocational training rather than a secondary education-level are more likely to be in the *Average Carbon Footprint*. In Latvia, respondents who have an academic rather than secondary education are less likely to be in the *Low Carbon Footprint, Low Well-Being* group, and more likely to be in the *High Carbon Footprint* group than respondents with a vocational training.

### 3.3.5 Housing type

In Germany, Respondents who live in a house rather than a flat are 2.9%-points less likely to be in the *Very Sufficient* group.

Respondents who live in a house rather than a flat are 10.8%-points more likely to be in the *High Carbon Footprint* group in Germany, 9.5%-points in Denmark, 8.5%-points in Latvia and 6%-points in France. Homeowners are also more likely to be in the *High Carbon Footprint* group in Germany. Living in a flat rather than a house is associated with lower carbon footprints (i.e. with being in the *Sufficient* and *Low Carbon Footprint, Low Well-being* groups) only in Denmark.

<sup>61</sup> Additional analyses were carried out to identify significant correlations between group adherence and having an academic degree rather than vocational training.



Respondents who live in a rural area rather than in a city are more likely to be in the *High Carbon Footprint* group in Germany, Denmark, Italy and France (respectively by 10.8%-points, 14.6%-points, 13.9%-points and 8.1%-points). Respondents who live in a town are also less likely to be in a sufficient or very sufficient group in Germany, and Denmark.

Respondents who live in a city rather than a town or rural area are less likely to be in the *Low Carbon Footprint, Low Well-Being* group in Denmark and contrarily to all other countries, respondents who live in a rural area rather than a city are 4.7%-points more likely to be in the *Sufficient* group in Latvia. This is due to the widespread use of biomass as heating system in Latvian rural areas.

### 3.3.6 Environmental awareness

The relationship between carbon footprint, sufficiency and environmental awareness is particularly strong in Germany and Italy.

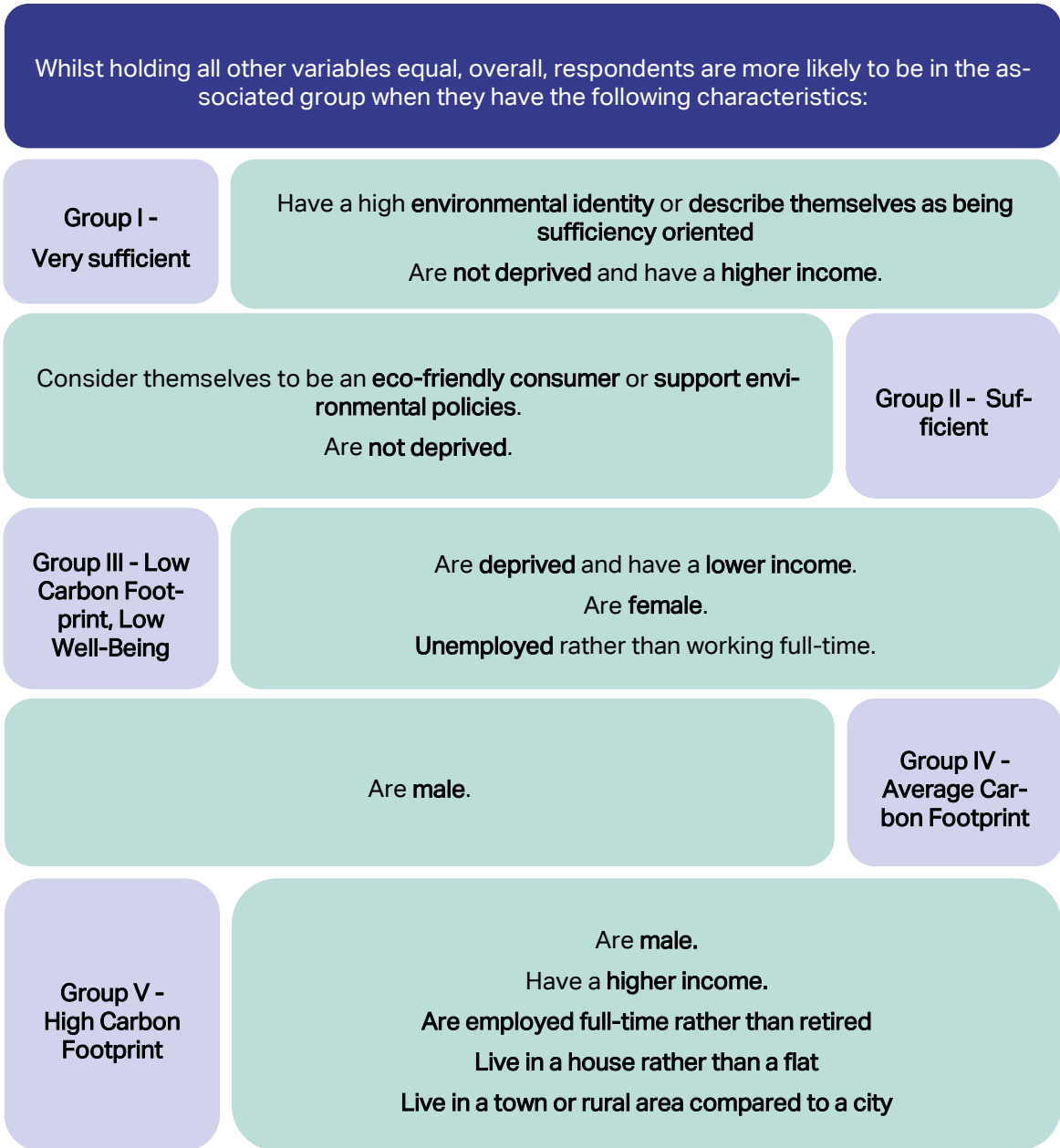
In Germany, respondents who try to use little resources are more likely to be in the *Very Sufficient* group, and less likely to be in the *High Carbon Footprint* group in Germany. Respondents who consider themselves to be an environmentally friendly consumer are less likely to be in the *Average Carbon Footprint* group. Both in Germany and Latvia, respondents who consider themselves to be an eco-consumer are more likely to be in the *Sufficient* group. In Italy, they are less likely to be in the *High Carbon Footprint* group.

In Germany and Denmark, we find a relationship between the carbon footprint and the fact of supporting environmental policies. In Germany, respondents are less likely to be in the high carbon footprint group if they support environmental policies, while in Denmark and Latvia, they are more likely to be in the *Sufficient* group.

In Italy, the concern about the environment appears to be an important variable. Respondents who are concerned about the environment are more likely to be in the *Very Sufficient* group, less likely to be in the *Low Carbon Footprint, Low Well-Being* group and the *Average Carbon Footprint* group. However, respondents who are concerned about the environment are also more likely to be in the *High Carbon Footprint* group, which indicates a non-linear relationship.



### 3.3.7 Main characteristics in all countries



Characteristics were included in this figure if they had a significant correlation in at least three out of the four countries.

Figure 13. Summary of group characteristics for Denmark, Germany, Italy, and Latvia



## 4 Mesosocial determinants of sufficient lifestyles

This part of the deliverable builds on material from D4.2. and D4.3., focused on the meso-level i.e. local initiatives of sufficiency. The aim of these two deliverables was to identify respectively 1) drivers and barriers that enable or prevent the success and outreach of local sufficiency initiatives and their relationship with municipalities and 2) the multiple intended and actual effects of sufficiency initiatives.

The methodology of D4.2 and 4.3 was divided into two parts. The first part was a survey among local sufficiency initiatives that was designed by the Wuppertal Institute with the support of all project partners. Besides collecting key data on the initiatives, the survey focused on two topics: the impacts the initiatives were aiming at and the interaction with municipal governments and administrations. The survey was conducted in 5 EU-countries: Denmark, France, Germany, Italy and Latvia. In order to gain further knowledge about the international context, Indian initiatives also participated in the survey. In total, 64 valid surveys were analysed from the EU participants and 3 from India. The second step of this work package was national workshops with initiatives and municipalities. Based on the preliminary results of the survey, the workshops aimed at analysing the cooperation between initiatives and municipalities as well as the multiple effects of the initiatives. In order not to limit the results and to allow for unexpected outcomes, the planning of the individual workshops was not restricted by guidelines, so that each project partner could design the workshop according to what each partner deemed necessary. The workshops were held in 5 countries by the corresponding project partners: International Network for Sustainable Energy-Europe Inforce (Denmark), Wuppertal Institute for Climate, Environment and Energy (Germany), Association négaWatt (France), Politecnico de Milano (Italy) and Zala Briviba (Latvia). In total 70 representatives of initiatives and municipalities attended the workshops.

### 4.1 Sufficiency initiatives and municipalities: drivers and barriers

The aim of this work package (WP4) was to identify, at the meso-level, drivers and barriers that enable or prevent the success and outreach of local sufficiency initiatives. Both the survey and the workshop showed similar results.

The main barriers for local sufficiency initiatives are a lack of financial and human resources. Initiatives do not necessarily have a problem with finding volunteers, but dealing with municipalities can take up a lot of their (free) time and requires at least some experience in this field. This is a major challenge for voluntary initiatives with no paid staff for administrative tasks. The survey showed that the biggest concern was funding, although funding can be both a barrier and a driver. While most initiatives were positive about funding opportunities of municipalities, they suffered from time consuming and lengthy processes. They also mentioned that funds are often one-time payments, whereas ongoing payments would be more helpful. Lack of time and a high workload are also a major challenge identified by the survey participants. Survey and workshop participants also identified considerable legislative and administrative barriers. A major problem was that administrative competences of municipal departments do not necessarily match the scope of initiatives. This is a barrier for communication and participation. For example, eco-villages or communal supported agriculture initiatives reported difficulties in participating in local zoning or city planning.

The workshops also identified a lack of organisational and administrative know-how which can impede cooperation with municipalities. They also highlighted the lack of information coming from local authorities about the funding processes.

Funding and support from employees at city administrations were not only problematic, but also positive and encouraging experiences had been mentioned. Both the workshops and the survey made it clear that the quality of cooperation depends very much on the particular municipality and the people working there. Another important success factor identified in the survey was the cooperation within the team of the initiative itself, which should be based on motivation and a shared vision.



Overall, initiatives need a supportive and integrating environment. Local sufficiency initiatives want to be part of the community and therefore need to have an acknowledged place in the city structure. For example, with dedicated contact personnel, participation in urban planning processes, (long-term) funding, checklists or meeting rooms. There is also a consensus in the survey and the workshop that networking is crucial for the success of an initiative and that municipalities can also help with this.

First and foremost, the framework and structure provided by municipalities and governments at the meso level is not very welcoming to sufficiency initiatives. Sufficiency initiatives find it difficult to apply for funding, to be included in planning processes or simply to find the right contact person. Although a few initiatives have had good experiences of working with municipalities, most of them struggle to find motivated and supportive employees within city administrations.

Repeatedly, initiatives have indicated a lack of networking opportunities with other initiatives, no matter what field they are working in. Especially during the workshops, there was an interest in each other's initiatives and even an interest in international exchange. Networking events are both opportunities for learning as well as outreach.

## 4.2 Multiple effects of initiatives on sufficiency

Both the survey and workshops show similar tendencies describing the areas of impacts.

In the analyses of the survey and workshops the impacts of sufficiency initiatives are defined in three areas: habits, infrastructures and societal frameworks. Most of the initiatives show evidence in working in a practical way with a bottom-up approach, with the aim of influencing the societal framework, by "explaining and demonstrating the benefits of a more sustainable and sufficient lifestyle to individuals" (D4.3, Annex 1, Question 16). In order to meet this objective, the workshop revealed that initiatives use subordinate goals such as gaining or sharing experiences and having a broad impact, which can be anything from awareness raising to influencing individuals or municipalities. As with experiences, it is important for initiatives not only to share their knowledge with society, but also to have an exchange with other initiatives in order to improve their work. Broad impact depends partly on the professionalism of the initiatives, but some initiatives made it clear that more professional and "bigger" initiatives can also be used to plant ideas on a larger scale.

Initiatives are aware of the fact that societal change cannot depend solely on changes in individual habits, but also changes in infrastructure that support sufficient behavior. Initiatives on housing and mobility are more likely to address infrastructures than those focusing on food or products.

Most initiatives believe that their impact on sufficiency can be supported by evidence. Much of this is qualitative, such as the provision of best practice examples or their visibility in the media. Quantitative measures of sufficiency tend to be provided by more professional initiatives, such as the number of goods repaired or even concrete metrics such as reductions of CO2 emissions.

Most local initiatives face an uphill battle, as small and local initiatives can only share their knowledge and motivate individuals in rather specific wealthy and educated milieus. Many of them are also able to provide some infrastructure to support a sufficient lifestyle. Even if their goal is to change the societal framework, they often lack outreach and remain a niche activity within an altogether unsustainable urban system.



## 5 Micro-level determinants of sufficiency: Diffusion of innovation processes in energy sufficiency

Diffusion of Innovations is a theory that aims to explain how, why, and how fast innovations spread. « Innovation » naturally refers to technologies but also to practices and behaviours, and thereby to lifestyles. The criterion for something to be considered an innovation is that it is perceived as 'new' by an individual or an organisation. Thus, the initiatives adopted by our respondents, whether shared housing, zero waste, or lightweight dwelling are innovations in terms of practice, and in some cases in terms of technology. The theory of the diffusion of innovations applies to the initiatives studied and enables us to improve our understanding on how sufficiency initiatives diffuse among individuals, and how they could be more widely diffused. The other interesting aspect for the project is also to distinguish between categories of adopters in order to be able to refine the scenarios.

In Diffusion of Innovations (Rogers, 1962), Everett Rogers argues that diffusion is the process by which an innovation is shared over time amongst participants in a social system. While adoption is an individual process detailing the succession of steps experienced by a given person, diffusion refers to a group phenomenon, suggesting how an innovation spreads among a set of people. This theory focuses on innovations that are freely adopted by individuals. The initiatives studied in this paper reflect such a focus.

Diffusion is difficult to quantify because humans and human networks are complex. It is difficult to measure what exactly causes adoption of an innovation (Damanpour and Greenhalgh 2001). Many forces act on an individual and his/her decision to adopt a new behaviour or technology. Diffusion theories can never account for all variables, but models help to identify major trends.

### 5.1 Characteristics of innovations

This theory enables us to detail innovations according to characteristics that can be used to describe their potential for diffusion. These criteria are the basis on which potential adopters assess the innovation and choose to adopt it or not. There are:

- The perceived benefit compared to conventional tools or procedures. Less risky innovations are easier to adopt. Costs can be monetary or not, direct, or indirect. Direct costs are usually related to financial uncertainty and the participant's economic situation. Indirect costs are more challenging to pinpoint. They may be related to impacts with regards to health, time, social image... T3.2. analysis showed that because they rely on a community and/or a group of people, initiatives allow for a mitigation of risk (shared) and a maximisation of benefit (multiplied). T3.2. also highlighted that the multiple benefits of sufficiency practices (enhanced quality of life, enhanced social relationships) are important as drivers for acting on one's carbon footprint.
- The compatibility with pre-existing practices. Innovations that are disruptive to other routine tasks will be less adopted than those that make them easier. This is also confirmed by our results: because they have more trouble fitting in existing rules and norms, the more disruptive sufficiency practices struggle
- The difficulty of appropriation. Barriers to adoption include knowledge requirements or practical difficulties, but the support from previous adopters or other sources can increase the chances for adoption. In D3.2., we explained how the recruitment of rather educated and resourceful individuals in sufficiency initiatives can also be related to the fact that operating a sufficiency initiative in a consumption-oriented society. This hinders a larger adoption of sufficiency-oriented initiatives. We have also noticed that some initiatives are easier to appropriate than others (e.g., community-supported agriculture versus tiny houses).





- The triability. Triability refers to different dimensions: is the practice easily accessible? Do people have the required resources to try them? (e.g., time, money)
- The potential for reinvention (using the tool for unexpected purposes). Processes of social distinction occur through objects and practices. But the possibility to divert, customize and even hijack things also reflect the creativity and crafting needs, in other words cultural dimensions of consumption.

These attributes are interactive and rated as a whole. We can look at the example of shared housing, investigated in T3.2.:

- its relative advantage may relate to cost reductions in comparison with living on one's own, but it also has advantages in terms of social relations.
- its compatibility with the pre-existing system is rather good since it requires little technological input, but it implies legislative adaptations (for group purchasing, or bank loans, for example) and thus changes in the societal frameworks, which could be long to achieve.
- its complexity or difficulty is moderate: it does not require life-changing bifurcations, but the level of social, financial and emotional engagement of living in a collective can be challenging.
- its testability is quite difficult as it is not easy to test living in a shared habitat for a short time, because this is generally a long-term commitment.
- its potential for reinvention and its observed effects are important, as we were told by users, for example regarding the cultural, intergenerational, skills and tools sharing aspects that were not initially anticipated.

The fuzziness of the boundaries of the innovation can impact its adoption (Denis et al., 2002). For example, the zero-waste initiative is not clear about what it exactly is: no waste, very few waste, only recyclable waste? This is likely to impact its potential for diffusion.

## 5.2 Influencing factors and strategies for the adoption of new behaviours

According to the literature and to the data we gathered during fieldwork, some factors influence the diffusion of a new behaviour or innovation. These include:

- communication channels: these enable the transfer of information from a unit to another. For diffusion to occur, communication mediums must at a minimum be established between the parties. For example, with zero waste, repair cafés, or fairs, communication is established through newsletters, street events, posters, social networks, and word of mouth. Many interviewees have also referred to online videos as vectors of communication on some specific environmental issues (such as climate, but also plastic waste), leading them to look for alternatives and join an initiative.
- time: innovations are rarely instantly adopted. According to Ryan and Gross (1950) adoption can take several years, even decades, and the early years are not very visible in terms of impact. In the case of tiny houses, for example, the innovation occurred in the late 1990s with the small house movement, and it is only starting to spread in Europe.
- social system / societal frameworks: it refers to the combination of external influences (mass media, government, and economic authorities, etc.) and internal influences (social relations, distance from opinion leaders). Their combination constitutes the overall influences on a potential adopter. The consumer depends on the infrastructure, the values of the subgroups to which he/she belongs to, and his/her own representation of innovation (Juan and Dobre, 2009). This is consistent with findings from Deliverable 3.2., in which we highlighted the relative social homogeneity of initiative participants.



Rogers (1962) depicts several strategies to support the diffusion of an innovation:

- Its adoption by a highly respected individual within a social network.
- Its injection into a group of individuals who would adopt it easily.
- The provision of benefits to early adopters.

### 5.3 The “5-steps” model of adoption

The adoption of an innovation involves a five-step decision-making process, derived from Prochaska and DiClemente’s theoretical model (1983), as exposed in the figure below. It occurs through a series of communication channels over a time span among members of a similar social system:

- awareness-knowledge: The individual is exposed to an innovation but has not yet been inspired to find out more information about it.
- interest-persuasion: The individual is interested in the innovation and is looking for information.
- evaluation-decision: The individual weighs the advantages/disadvantages and decides whether to adopt or reject the innovation.
- trial-implementation: The individual uses the innovation and may search for further information or step forward.
- adoption-confirmation: The individual finalizes his/her decision to continue, and potentially attempts to sensitise his or her group.

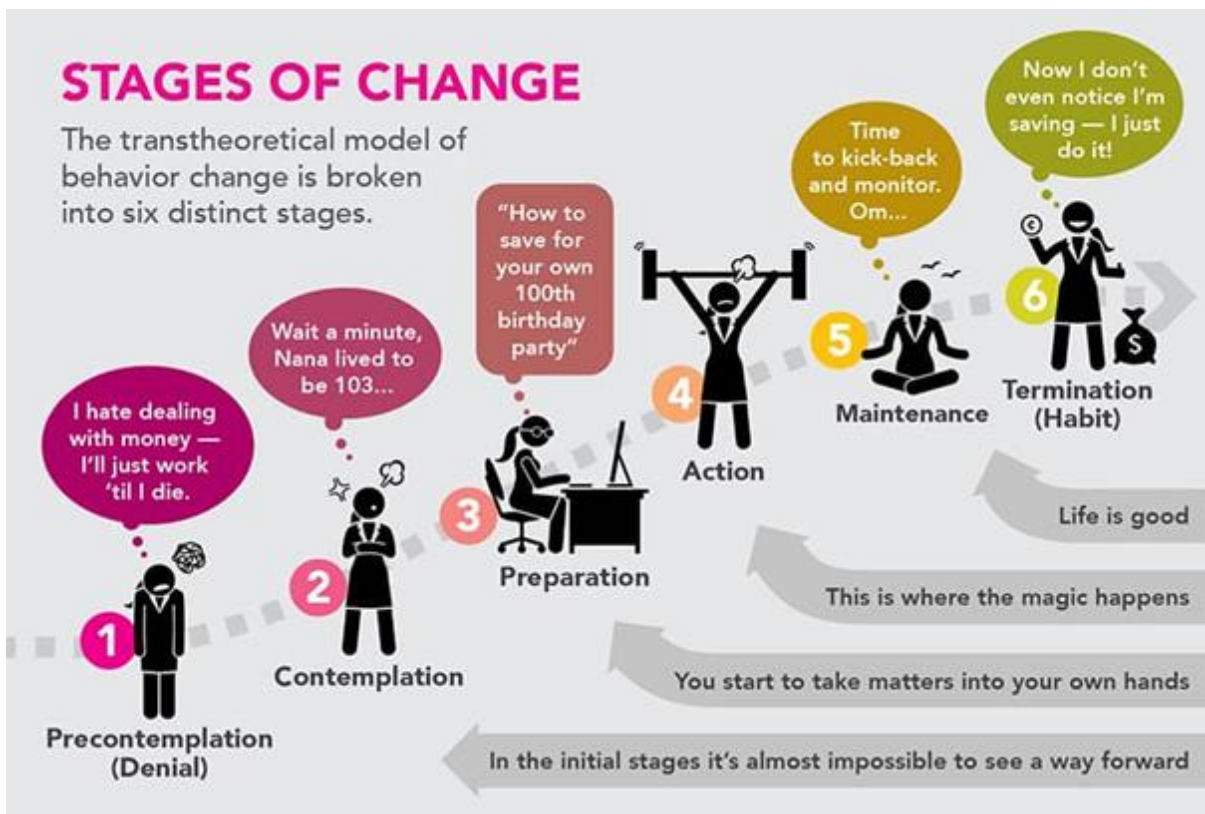


Figure 14. Stages of behaviour change according to Prochaska and DiClemente (1983), repinned by Camerin Ross (source: CamerinRoss.com)

A person might reject an innovation at any time during or after the adoption process (after the confirmation step). Cognitive dissonance can occur when the person realizes the range of possible life choices he or she is not yet disposed to make.

This progression has been observed in our surveys. The adoption process is often gradual rather than sudden. For example, in the case of zero waste, awareness is first raised with an initial gesture. Then the commitment deepens. When it comes to lightweight dwelling, the size of the house is reduced little by little.

*"I had no specific trigger but several factors". Woman, 30-40 years old.*

*"I moved to smaller and smaller flats before living in tiny house". Man, 30-40 years old.*

*"I started with food. It was very gradual". Woman, 30-40 years old.*

The adoption of a sufficient lifestyle can be measured in degrees of commitment or change, which are different for each practice: living in a tiny house is more compelling than participating in a community-supported agriculture initiative.

Each person engaged in a sufficiency-oriented lifestyle will also have different degrees of commitment within each initiative (e.g., community-supported agriculture: just buying or volunteering ; zero waste: no waste at all or fewer waste ; shared housing: which degree of sharing). We can draw those degrees of commitment in each lifestyle dimension through arrows, which are more or less tall according to the depth of the commitment. The figure below gives an example of representation of this diverse degree of commitment for an imaginary person who is very engaged in eating local products but far from being sufficient concerning digital consumption.

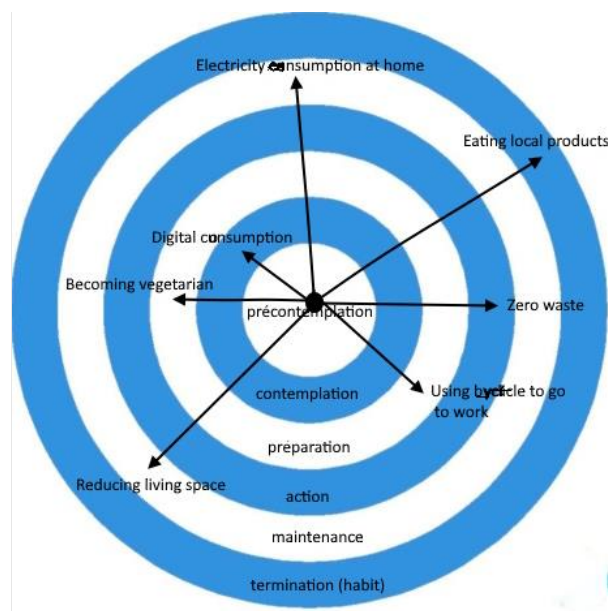


Figure 15. Illustration of the different degrees of commitment of an imaginary person, according to Prochaska and DiClemente (1983) steps. The size of the arrow indicates the degree of commitment.

In all cases, commitment is never definitive. Backtracking is always possible, depending on life and family circumstances.

## 5.4 The “adopter categories” model

### 5.4.1 Roger’s classification

Many individual personality traits have been explored to assess their links with the potential for adoption according to the innovation (Greenhad, 2004). Capacity and motivation have a major impact. Potential adopters who have the power or capacity to initiate change, particularly in organisations, are more likely to adopt an innovation than those who have less power over their life choices. This explains why individuals engaged in sufficiency-oriented initiatives often have highly educated profiles (see D3.2.). Secondly, people who are the most motivated to adopt an innovation are likely to make the required adjustments to adopt it. Motivation can be influenced by the meaning attached to an innovation or its symbolic value (Eveland, 1986). In our fieldwork,

we have noticed that meaning and the desire to make one's lifestyle match with values was indeed central in participants' motivations to join an initiative, though there are not always the first motivation (which can be more practical). The symbolic dimension also relates to the concept of "green distinction" (Grossetête 2019).

Rogers (1962) defines an adopter category as a classification of individuals within a social system based on innovativeness. He suggests a total of five categories of adopters in order to standardize the usage of adopter categories in diffusion research, that he tries to estimate in relative share of the population.

The diffusion of innovation's chart identifies 5 categories of people (according to Rogers, 1962, p282-283):

- **The Innovators/Pioneers** are more receptive to innovation. They represent only 2.5% of the population. They are willing to take risks regarding this innovation and have interactions with other Innovators. Their risk tolerance allows them to adopt technologies or behaviours that may ultimately fail. They don't need to be convinced or advised, they are convinced and find the information by themselves, they have closest contact to scientific sources. They may have a higher social status, and financial liquidity that help absorb their potential failures (e.g., pioneers of solar thermal or low-energy houses in the 1970s).
- **The Early Adopters** enjoy new things, try them out and share their opinions. Statistically, they represent 13.5% of the population. These individuals have the highest degree of opinion leadership. Early adopters have a higher social status, financial liquidity, advanced education and are more socially forward than late adopters. They are more discreet in adoption choices than Innovators. They use judicious choice of adoption to help them maintain a central communication position.
- **The Early Majority.** They are awaiting feedback from the first experiments. This category represents 34% of the population. They adopt an innovation after a varying degree of time that is significantly longer than the innovators and early adopters. Early Majority people have above average social status, contact with early adopters and seldom hold positions of opinion leadership in a system.
- **The Late Majority** waits for the innovation to be used across a large population. They expect to have some evidence of performance. They are strongly influenced by the views of other users. They represent 34% of the population as well. They adopt an innovation after the average participant. These individuals approach an innovation with a high degree of scepticism and adopt it after the majority of the society already has. Late Majority are typically sceptical about an innovation, have below average social status, little financial liquidity, are in contact with others in Late and Early Majority and have limited opinion leadership.
- **The Laggards** are the last to accept an innovation. They will only purchase new items once they have been tested and become mainstream. They represent 16% of the population. These individuals are generally averse to change-agents. Laggards typically tend to be focused on "traditions". They tend to have lower social status, lower financial liquidity, are commonly older, and only have contact with family and close friends.

According to Rogers (1962), the adoption of an innovation follows an S curve (logistic function) when plotted over a length of time, as displayed in the figure below.



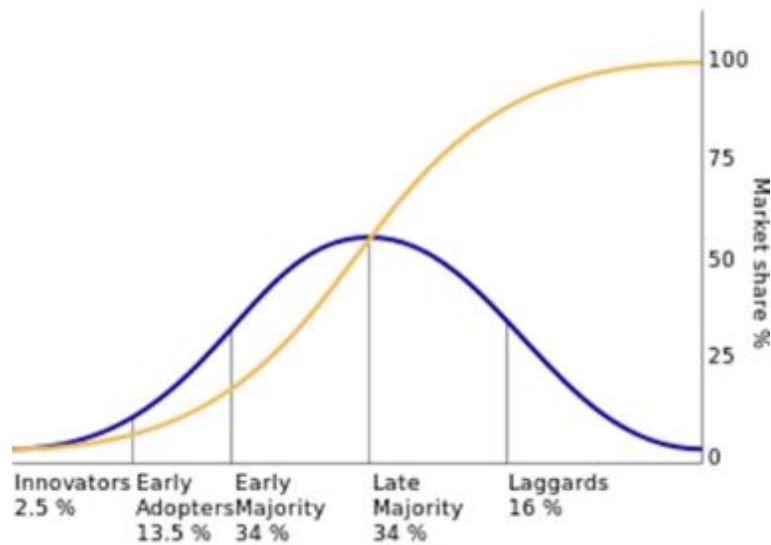


Figure 16. The diffusion of innovation curves, according to Rogers (1962<sup>62</sup>).

However, there are other possible models. Multi-agent models provide rules (algorithms) to model diffusion of ideas and innovations. Complex network models can also be used to investigate the spread of innovations among individuals connected to each other by a network of peer-to-peer influences, such as in a physical community or neighbourhood.

This model can be applied to all the initiatives under study. For example, in the case of lightweight dwelling, this type of practice has so far met with a very limited audience of "pioneers", usually building their own housing. "Early adopters" are only starting to show interest in this concept. But enough so that "manufacturers" of tiny houses and other types of lightweight housing are developing and offering a variety of formats tailored to less committed populations.

In sufficiency scenarios, it is of great importance to make a clear distinction between pioneers and early adopters. Pioneers are those at the origin of initiatives, being involved in the operation (for instance by volunteering in an association or setting up an initiative). They are the engine of the initiative, and are highly committed to their cause. Early adopters attend an affiliated social place (such as repair cafés or zero-waste workshops, or a shared accommodation that they did not create). They are the public of participants in the initiative. The early majority relies to a certain degree of dissemination, when the initiative has proven its effectiveness. It is often the public the initiative tries to appeal to.

## 5.4.2 Characteristics of pioneers and early adopters in sufficiency-oriented initiatives

According to our fieldwork research, the main distinction between pioneers and early adopters is access to information and aptitude for change. Access to information is mainly provided by networks and word to mouth, which is why meeting someone involved in an initiative is often key in the adoption process. The most frequently emphasised needs are social interaction and the "do it yourself" capability, which is also reflected in time affluence (time needed to experiment and learn new things).

We found no family predisposition to adopting a sufficient lifestyle; for example, within the same family, there are highly different profiles (siblings with very distinct lifestyles choices).

However, for those with a sufficient lifestyle, grandparents are often referred to as a source of inspiration. They lived during or after the war and coped with little. They might have been in close contact with nature, by being farmers or by living in a more autonomous way (vegetable garden,

<sup>62</sup> The yellow curve represents the percentage of adoption in the overall population, and the blue curve represents the number of adoptants per category.



henhouse, etc.). Grandparents from working class and/or from immigrant backgrounds also did not have access to mass consumption.

People with a basic need for autonomy and meaningful living are more likely to be part of such initiatives. As noted in D3.2., for these individuals, the quest for “plenitude” (Schor and Thompson 2014), a “good life” (Soper 2007), and self-realization seems to surpass the lure of accumulation.

Individuals with previous experiences in which they have been able to practice a sufficient lifestyle are also more represented (backpacking / communities gathering): the experimentation phase often happens while on vacation. It is easier to be opened to new experiences outside of the daily routines and without the time pressure of work.

*“It started when I spent a year on a sailing boat. You get used to living off few things.”*  
(Man, 38, France).

As noted earlier, relationships and encounters also play a major role in the adoption process, such as knowing someone in a community-supported agriculture initiative, or in a material library, etc.

A dynamic geographical area where initiatives are numerous, and accessible, is also a strong driving force. It is not unusual that sufficiency-oriented communities develop in networks in specific geographical areas, where people purposely come in order to find driving communities. This builds a momentum that reaches more people locally and then spreads to nearby territories.

Yet, globally, the main common point identified is a fairly high levels of education. Income does not necessarily constitute a criterion, as sufficiency can lead to the decision to earn little. In fact, this is often mentioned in the qualitative interviews we conducted with participants in sufficiency-oriented initiatives (see D.3.2.). Nonetheless, participants often have savings which allow them to shift to a less earning profession.

*“I was working part-time. Having time made it possible for me to make the transition. One of the levers was that I have been able to do free woofing while receiving RSA. Otherwise, I would have done this less longer because I don’t have much money aside, and I couldn’t volunteer as much on relevant projects today.”*(Female, 50-60 years-old, Germany).

What characterises the pioneers as opposed to early adopters is that they are quite autonomous, all the more so with regard to the theme of sufficiency, as autonomy-freedom appears to be one of the main needs they try to fulfill.

Meanwhile, those who would like to disseminate face difficulties in doing so. They are perceived as sanctimonious or extreme. They end up surrounding themselves with similar people, which implies that the diffusion is limited their own category of “like-minded people”, a term many of our interviewees have used to refer to their social networks.

Within the family, diffusion is not an easy task either; spouses may find it difficult to cope with their partner’s excessive commitment to a demanding lifestyle. Children, especially teenagers, can show reluctance about certain measures (for example, digital consumption and food). As they reach adulthood, children make good disseminators, but this takes time, as a respondent explained:

*“My parents used to own an organic store. It was one of the first ones. So growing up, I had a moment when I rejected this lifestyle. But I’m coming back to it since I have had children.”*  
(Woman, 30-40 years old, France)

### 5.4.3 From sufficiency practices to sufficient lifestyles

- Adopting a sufficient practice often leads to other sufficient lifestyle choices.

Our fieldwork data reveals that the respondents may be pioneers in a particular initiative (related to a specific practice) or a sector without necessarily being pioneers in another one. On the other hand, participating to an initiative often have important spillover effects on other aspects of the





lifestyle (for details, see D3.2.). Generally, commitment to one focus provides the opportunity to address other aspects through the diffusion processes (meetings, etc.) as outlined in each sector.

The person's commitment can be viewed as a plurality of sufficient approaches, with varying degrees of commitment, and each approach stimulating the other. Being highly committed to one approach makes commitment to other approaches more accessible. Once a person feels that he/she has covered all the aspects of an initiative, he/she often wants to go further and therefore to engage in other sufficient life choices. The experience gained (overcoming obstacles) provides impetus even for other sectors.

From this we conclude that encouraging individuals to jump into one initiative (which they find beneficial, straightforward, easier, more accessible to them, etc.) is a sound strategy to enable horizontal diffusion to other initiatives. Investing in an initiative creates spillover effects.

- The mass threshold

Innovation requires widespread in order to be self-sustaining. The adoption rate reaches a point where an innovation meets a critical mass, i.e., a sufficient number of adopters of a new idea, technology, or innovation within a social system, so that rate of adoption becomes self-sustaining and requires infrastructural change.

In 1991, Geoffrey Moore (Moore, 1999) introduced the term 'chasm' in his book "Crossing the Chasm", to refer to a gap between early adopters and early majority. This crossing is critical as it is the point where an innovation drops out of its niche market and enters a mass market. On the adoption curve, at a certain point, the innovation reaches a critical mass. This is the point where the number of individual adopters ensures that the innovation is self-sustaining. The market-oriented vision of Moore assumes that an innovation will fail if its market does not reach the critical mass. This is less true of sufficiency-oriented initiatives, who do not seek to "expand their markets". However, the ability to reach the critical mass still is important because this is what gives initiatives leverage and legitimacy to act on societal frameworks (e.g., legislative and normative environments). Hence, this is often a goal for initiatives, and what they refer to as "up-scaling".

Moore's major insight is that the first two categories before the chasm (Innovators and early Adopters) seek radical change, while the others want improvement. The latter group wants a finished product, while the former embrace imperfections and possess the technical skills to immediately recognize the benefits. Social norms are more important to these later groups, they are more likely to adopt if others do.

The rate of adoption is defined as the relative pace at which participants adopt an innovation. It is usually quantified by the time required for a certain percentage of members of a social system to adopt an innovation. Rates of adoption for innovations are determined by the individual's category of adopter. In general, first-time adopters of an innovation require a shorter adoption process than late adopters.

## 5.5 Communication channels

Rogers (1962) defines homophily as "the degree to which pairs of individuals who interact are similar in certain attributes, such as beliefs, education, social status, and the like". When given the choice, many individuals usually choose to interact with someone similar to themselves. Homophilous individuals engage in more effective communication because their similarities lead to greater knowledge gain as well as attitude or behaviour change. As a result, homophilous people tend to promote diffusion among each other (McPherson et al., 2001). However, diffusion requires a certain degree of heterophily to introduce new ideas into a relationship; if two individuals are identical, no diffusion occurs because there is no new information to exchange. In addition, homophily is a barrier to the social diffusion of initiatives, who struggle to reach a wider audience and may suffer from stereotypes and be accused of ostracism if too socially homogeneous. Therefore, an ideal situation would involve potential adopters with a balance of homophily and heterophily.



Promotion of healthy behaviour provides an example of the balance required of homophily and heterophily. People tend to be close to others of similar health status. As a result, people with unhealthy behaviours like smoking are less likely to encounter information and behaviours that encourage good health. This presents a critical challenge for health communications, as ties between heterophilous people are relatively weaker, harder to create, and harder to maintain. Developing heterophilous ties can increase the effectiveness of the diffusion of behaviours. As an example, people frequenting hypermarkets are less likely to meet people who practice zero waste and attend bulk shops or local producers. Thus, this practice does not spread easily between communities.

Not all individuals exert the same influence on others. Accordingly, opinion leaders have an influence on the diffusion of either positive or negative information about an innovation. Rogers relies on the ideas of Katz & Lazarsfeld (1970) and the two-step flow theory in developing his ideas on the influence of opinion leaders.

Opinion leaders have the most influence during the evaluation stage of the innovation-decision process and on late adopters (Rogers, 1962, p219). In addition, opinion leaders typically have greater exposure to the mass media, more cosmopolitan, greater contact with change agents, more social experience and exposure, higher socioeconomic status, and are more innovative than others. Radford et al. (2011) found that both direct word of mouth and example were far more influential than advertising, which was only effective if it reinforced direct influences. This led to the conclusion that advertising was best targeted, if possible, towards the next adopters, not towards those remaining unreached by the chain of influence.

Recent research by Wear (2008) shows that particularly in rural areas, significantly more innovation takes place in communities which have stronger inter-personal networks (see D3.3).

## 5.6 Levers and barriers to the diffusion of sufficient lifestyles

As explained above, the adoption of a sufficient lifestyle can be measured in degrees of commitment. Encouraging individuals to jump into one initiative (which they find beneficial, straightforward, etc.) is a sound strategy to enable horizontal diffusion to other initiatives.

Our fieldwork data has also shown that innovations are not necessarily chosen for their sufficient dimension but end up inducing it. For example, shared housing is often driven primarily by financial considerations, but it ultimately leads to more sufficient behaviours. Solidarity grocery shops, places where people involved in social issues can meet, help to spread a concern for local products and bulk food. People are not going to these grocery shops for reasons of sufficiency, but the range of products available does induce it. Similarly, financial or health constraints may be the reason for shared housing (dependency) or vegetarian food. It is therefore possible to appeal to an audience which is not particularly interested in sufficiency through multifaceted initiatives.

Many interviewees mention an initial realization regarding food (selecting products, making meals), in terms of quality, health, ecology, meaning and territory. Responsible food takes on social aspects (territories, farmers, supporting local sectors or employment), which may be more attractive than its eco-friendly aspect for some profiles. Food serves as a good entry point to each other audiences.

We focused on innovations adopted by choice, but it emerges from the surveys that constraint (either financial or legal) is not necessarily seen negatively. The respondents mention the difficulty they face in self-imposing a change, however willingly. Although they are amongst the most motivated since they are pioneers, they believe that constraint stimulates an energy that is sometimes too difficult to find on one's own. *"I often go skiing even though I wish I could gather enough energy to refrain myself from doing so. It should be banned!"* says a 31 years-old male from France. The same is mentioned about speeding on motorways, air travel, packages, ... Yet, people also want to keep freedom of choice. Thus, the constraint on sufficiency targets (prohibitions, obligations, etc.) helps to adopt sufficiency behaviors, but for it to be well accepted, it seems helpful to let people decide how to achieve them or put them into practice. For example,





broad guidelines (e.g., CO2 quotas) could impose objectives but let the choice of how to reach them, provided an equal access to alternatives.



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## Conclusion and discussion

This task aimed at analysing the data collected in WP3 and in WP4 through a macro level perspective to identify and understand the structural drivers and social determinants that are at play in the diffusion processes of sufficient lifestyles and in the transformation of social norms and values in society. Based on the findings of WP2, WP3 and WP4, we investigate how micro, meso and macro determinants of sufficiency interact in a cross-country perspective.

Results show that institutional contexts and national policies vary greatly across the six countries under study. These broad social frameworks create path dependency and are likely to impact how citizens reflect on sufficiency practices and sufficiency-oriented policies. In Latvia and to a lesser extent in Germany, the Soviet legacy and neoliberal restructuring of the economy in the 1990s that instilled an individualistic spirit, hindering initiatives that invoke a broader sharing of resources such as co-ownership or cohabitation. While some Eastern Germans have referred to it as an important part of their lifestyle, it does not seem to be the case in Latvia. “West” European countries display a common history regarding the oil crisis and the energy saving campaigns of the 1970s, revived by the context of rising energy prices. This has resulted in a significant increase in public interest in energy efficiency and local renewable energy solutions; though sufficiency has been approached only marginally as a potential solution for dealing with the energy crisis. The type of policies deployed in all European countries is similar and rely on price mitigation through direct or indirect subsidies, though their specificities depend principally on the energy mix of each country and on cultural and climatic factors. Despite not being concerned with the current energy crisis catalyzed by the Ukraine war, India seems to be the only country where some energy policies could be associated with sufficiency, within its context of deeply inequitable energy use across social classes and public efforts to mitigate them. For example, India is the only country where progressive tariffs for electricity and quotas for municipal water have been put in place in some urban areas. In France, sufficiency as a concept has been implemented as a rationale to face the 2022-2023 winter crisis, but its implementation is limited to cutting energy waste and promoting energy savings, not addressing issues of energy justice. More broadly, sufficiency as a concept remains widely unknown by respondents in all countries but France, where the word *sobriété* has been used for a long-time by environmental social movements and NGOs to refer to the opposite of over-consumption.

Regarding macrosocial determinants of sufficient lifestyles, the econometric analysis performed in section 2 shows, on the contrary, relatively consistent results across countries (except for India, for which the data was not yet available). In all countries, gender, affluence, values, degree of urbanisation and housing type (i.e., flat or a house) appear to be the main discriminant variables to compare whether respondents are more likely to be in one sufficiency group than another. These results indicate gender inequalities in energy consumption, that appear in all countries with females, *ceteris paribus*, having a lower carbon footprint than males. The impact of income is also quite consistent across countries. Higher levels of income tend to decrease the probability of being in the categories *Low Carbon Footprint*, *Low Wellbeing* group and to increase the probability to be in the *High Carbon Footprint* group. Germany is the only country where the probability that the respondent is in the *Very Sufficient* group decreases with income while no relationship between a highly sufficient lifestyle and sufficiency is found in the other countries. Other indirect measures of affluence indicate that the economic stress is negatively correlated with being in the sufficiency groups. The rural/urban divide is also consistent in all countries except for Latvia, where respondents who live in a rural area are more likely to be in the *Sufficient* group, due to the wide use of biomass for heating in rural areas. The relationship between carbon footprint, sufficiency, and environmental awareness is particularly strong in Germany and Italy, but does not appear as a prime determinant of lifestyles.

The mesosocial determinants of sufficient lifestyles tend to confirm the drivers and barriers found at the individual level in T3.2. The main barriers for local sufficiency initiatives are a lack of financial and human resources, which are even more important because of the complexity of dealing with municipalities that are not organized, nor trained to support sufficiency-oriented initiatives. The municipal administrative system and governance often does not match the scope of initiatives or fail to meet their needs. Organisational and administrative know-hows are



thus crucial, which explains the “administrative burden” many participants in sufficiency-oriented initiatives have mentioned in D3.2. A more welcoming framework and infrastructure for sufficiency-oriented initiatives at the local level would thus help both the dissemination of initiatives and the willingness for individuals to engage in such practices, by lowering the need for volunteering and time-consuming commitments. This is also confirmed by the results of the study on their impact. Small and local initiatives can only share their knowledge and motivate individuals in rather specific wealthy and educated milieus. Even though they are aware of the fact that societal change cannot depend solely on changes in individual habits and wish to address infrastructural changes, they seem to lack opportunities to do so.

The results of the research on the microlevel also points to the degree of commitment that is necessary to adopt a sufficiency-oriented lifestyle, and that necessitates a step-by-step approach to change practices gradually and not “switch lifestyles” overnight. However, an important lever for engaging in this kind of initiative is the existence of multiple cobenefits that are likely to attract other types of publics than those who are interested in sufficiency *per se*. Our fieldwork data has shown that initiatives are not necessarily chosen for their sufficient dimension but end up inducing it. For example, shared housing is often driven primarily by financial considerations, but it ultimately leads to more sufficient behaviours. Solidarity grocery shops can help to spread a concern for local products and bulk food while meeting the needs of the economically vulnerable. It is therefore possible to appeal to an audience which is not particularly interested in sufficiency through multifaceted initiatives and through strengthening the bonds between the social work sector and pro-environmental initiatives. Indeed, as shown in D3.2., despite its inclusive dimension sufficiency as a concept has been driven mainly by the pro-environmental sector that has insisted more on its “ceiling” aspect than on its “floor” aspects, thus failing to answer the issues of energy and climate justice. That said, the biggest issue at stake for meeting the targets of the Paris Agreement is to disseminate sufficiency among more affluent categories of the population, who have larger footprints and larger agency to reduce them. In this respect, it is worth noting that more affluent categories of the population tend to adopt a wait-and-see approach and do not change their lifestyles unless constrained to do so.

Early adopters cannot spread good practices to other segments of the population if they are not supported by an ambitious regulatory and infrastructure framework. Local communities and should also enable them to spread more widely by supporting existing initiatives.



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## Appendix 1. Trends of energy consumption in Denmark, Germany, France, Italy, and Latvia

	Solid fossil fuels	Natural gas	Oil and petroleum products	Renewables and biofuels	Electricity	Heat
EU	4.2	38.0	15.6	26.8	5.2	10.2
Denmark	:	17.2	3.2	38.0	3.9	37.7
Germany	0.8	43.8	28.0	16.8	1.7	9.0
France	0.1	35.7	13.6	34.1	12.6	3.9
Italy	:	59.9	6.9	28.9	0.4	3.8
Latvia	0.2	8.0	3.3	52.3	0.9	35.3

Table 6. Share of fuels in the final energy consumption of the residential sector for space heating, per country, 2020 (source: EUROSTAT)

	Solid fossil fuels	Natural gas	Oil and petroleum products	Renewables and biofuels	Electricity	Heat
EU	0.5	31.7	13.2	3.6	50.9	0.0
Denmark	:	2.6	:	:	97.4	:
Germany	:	2.9	:	:	97.1	:
France	0.0	31.7	19.6	:	48.7	0.0
Italy	:	68.7	10.1	5.1	16.2	0.0
Latvia	0.0	39.8	16.2	28.3	15.8	0.0

Table 7. Share of fuels in the final energy consumption of the residential sector for cooking, 2020 (Source : EUROSTAT)

	Number of passenger-cars per thousand inhabitants, 2021
EU	567
Denmark	475
Germany	583
France	571
Italy	675



Latvia	404
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Table 8. Motorisation rate, 2021 (source: EUROSTAT)



## Appendix 2. Overview of covariates

	Variable	Description or question asked to respondents	Coding
Sufficiency orientation	<i>Like low resource use</i>	<i>How strongly do you agree with the following statements? Through my lifestyle I want to use as little resources as possible (e.g. water, energy, wood)</i>	5-point Likert scale: 1: Strongly disagree 5: Strongly agree
	<i>Like to possess less</i>	<i>I find it desirable to possess only few things.</i>	5-point Likert scale: 1: Strongly disagree 5: Strongly agree
	<i>New things considered waste</i>	<i>All the new things that are sold all the time are a big waste of resources to me.</i>	5-point Likert scale: 1: Strongly disagree 5: Strongly agree
	<i>Dislike product variety in supermarkets</i>	<i>I think it is unnecessary to have this affluence of different products in our supermarkets.</i>	5-point Likert scale: 1: Strongly disagree 5: Strongly agree
Environmental identity	<i>Eco-consumer.</i>	<i>I think of myself as an environmentally friendly consumer.</i>	5-point Likert scale: 1: Strongly disagree 5: Strongly agree
	<i>Concerned with environment</i>	<i>I think of myself as someone who is very concerned with environmental issues.</i>	5-point Likert scale: 1: Strongly disagree 5: Strongly agree
	<i>Embarrassed to have an eco-lifestyle</i>	<i>I would be embarrassed to be seen as having an environmentally friendly lifestyle.</i>	5-point Likert scale: 1: Strongly disagree 5: Strongly agree
Care work	<i>Share cleaning</i>	<i>In your household, who mostly does the following things? Cleaning the house</i>	0: me; other household member 1: equally shared
	<i>Share shopping</i>	<i>In your household, who mostly does the following things? Buying / shopping for groceries and other household goods</i>	0: me; other household member 1: equally shared
	<i>Share washing</i>	<i>In your household, who mostly does the following things? Doing the laundry</i>	0: me; other household member 1: equally shared
General Deprivation	<i>Reduced expenditure</i>	<i>How often did you reduce your expenses for what you consider to be basic household necessities?</i>	0: never 1: at least once
	<i>Cannot afford unexpected expense</i>	<i>How often were you unable to afford an unexpected required expense and pay through your own resources?</i>	0: never 1: at least once
	<i>Cannot afford a holiday</i>	<i>I couldn't afford spending a week's vacation away from home although you wanted to go?</i>	0: no 1: yes
	<i>Receive gov. support</i>	<i>Do you or your family receive any form of financial support from the government on a monthly basis?</i>	0: no 1: yes
	<i>Instable income</i>	<i>My monthly income situation is mostly stable.</i>	0: yes 1: no
Policy support	<i>Support environmental policies.</i>	<i>I identify with environmentally oriented policies.</i>	5-point Likert scale: 1: Strongly disagree



			5: Strongly agree
	<i>Support liberal policies.</i>	<i>I identify with liberally oriented policies.</i>	5-point Likert scale: 1: Strongly disagree 5: Strongly agree
	<i>Support social policies.</i>	<i>I identify with socially oriented policies.</i>	5-point Likert scale: 1: Strongly disagree 5: Strongly agree
Control variables	<i>Age</i>		18-90
	<i>Female</i>		0 Male 1 Female
	<i>Income</i>	Net annual income of respondents household divided by household size using OECD weights <sup>63</sup>	In 10,000€
	<i>Employment status</i>	<i>Which of the following categories describes your current situation best?</i>	Full-time employed Part-time employed Self-employed In training / education House wife / house husband Looking for work / currently unemployed Retired
	<i>Education</i>	Highest level of education of respondent	Academic: Academic degree (Bachelor and Master degree or PhD) Vocational training: Vocational/technical training or education Primary or Secondary: No school completed/ Primary education/Secondary education (college, high school, middle school)
	<i>Homeowner</i>	<i>Did you rent or own your dwelling you lived in 2021?</i>	0: My household rents the dwelling in which I mainly lived. 1: My household is the owner of the dwelling in which I have mainly lived.

<sup>63</sup> That is, a value of 1 to the household head, of 0.5 to each additional adult member and of 0.3 to each child (cf. <https://www.oecd.org/els/soc/OECD-Note-EquivalenceScales.pdf>).



## Appendix 3. Model results

The following tables display the coefficients of the models in log odds. The base outcome is the *Very Sufficient* group.

Table 9. Results of the general model for Germany in log odds

	Sufficient	Low Carbon Footprint, Low Well-Being	Average Carbon Footprint	High Carbon Footprint
<b>Use little resources</b>	-0.582** (0.277)	-0.781*** (0.268)	-0.645*** (0.244)	-0.828*** (0.254)
<b>Possess only few things</b>	-0.082 (0.190)	-0.139 (0.184)	-0.232 (0.163)	-0.232 (0.172)
<b>New things are a waste</b>	-0.410* (0.220)	-0.152 (0.215)	-0.121 (0.193)	-0.294 (0.203)
<b>Too much in supermarkets</b>	0.301 (0.188)	0.120 (0.182)	0.189 (0.163)	0.242 (0.172)
<b>Eco-consumer</b>	0.591** (0.252)	0.495** (0.239)	0.208 (0.212)	0.352 (0.225)
<b>Concerned with environment</b>	-0.066 (0.233)	-0.120 (0.224)	-0.090 (0.201)	-0.171 (0.212)
<b>Embarrassed to have an eco-lifestyle</b>	0.083 (0.147)	0.169 (0.142)	0.044 (0.128)	0.047 (0.135)
<b>Had to reduce expenditure for basics</b>	-0.214 (0.398)	0.965*** (0.370)	0.731** (0.327)	0.762** (0.349)
<b>Unable to afford unexpected expense</b>	0.580 (0.484)	0.370 (0.447)	0.163 (0.413)	0.432 (0.435)
<b>Could not afford a week's holiday</b>	0.065 (0.473)	0.477 (0.422)	0.479 (0.391)	0.804* (0.413)
<b>Receive governmental support</b>	0.470 (0.610)	0.475 (0.546)	0.118 (0.524)	-0.128 (0.569)
<b>Instable income</b>	-0.681 (0.547)	0.522 (0.448)	-0.046 (0.425)	0.126 (0.446)
<b>Support social policies</b>	-0.171 (0.218)	0.026 (0.210)	0.018 (0.189)	0.013 (0.199)
<b>Support liberal policies</b>	-0.141 (0.186)	-0.334* (0.181)	-0.214 (0.161)	-0.241 (0.170)
<b>Support environmental policies</b>	-0.122 (0.257)	-0.070 (0.244)	-0.168 (0.222)	-0.347 (0.231)
<b>Age</b>	0.001 (0.016)	0.018 (0.016)	0.025* (0.014)	0.033** (0.015)
<b>Female (vs. male)</b>	-2.338*** (0.529)	-1.813*** (0.523)	-2.631*** (0.496)	-2.612*** (0.507)



Income per person (in 10T€)	0.350***	0.105	0.266**	0.441***
	(0.119)	(0.123)	(0.106)	(0.111)
Vocational training (vs. secondary)	-0.492	-0.186	-0.200	-0.437
	(0.441)	(0.416)	(0.382)	(0.400)
Academic degree (vs. secondary)	-0.639	-0.420	-0.452	-0.761*
	(0.467)	(0.457)	(0.409)	(0.430)
Rural (vs. city)	1.214**	0.775	1.099**	1.656***
	(0.578)	(0.567)	(0.528)	(0.544)
Town (vs. city)	-0.477	-0.798**	-0.015	0.279
	(0.373)	(0.367)	(0.315)	(0.336)
House (vs. flat)	0.371	0.647	0.742**	1.304***
	(0.417)	(0.407)	(0.359)	(0.377)
Homeowner (vs. tenant)	-0.173	-0.580	-0.315	0.210
	(0.405)	(0.404)	(0.348)	(0.367)
Retired (vs. full-time)	-0.031	0.432	-0.006	-0.369
	(0.630)	(0.609)	(0.553)	(0.574)
In education (vs. full-time)	0.825	0.677	0.658	0.190
	(0.747)	(0.748)	(0.671)	(0.768)
Unemployed (vs. full-time)	0.251	1.345	0.109	-0.032
	(1.310)	(1.197)	(1.175)	(1.218)
Part-time (vs. full-time)	-0.885*	-0.888**	-0.777**	-1.546***
	(0.463)	(0.444)	(0.371)	(0.413)
Homemaker (vs. full-time)	-1.098	-0.221	-0.584	-1.340**
	(0.813)	(0.666)	(0.585)	(0.668)
Self employed (vs. full-time)	-1.810*	-0.694	-0.565	-0.802
	(0.924)	(0.724)	(0.597)	(0.631)
Constant	6.894***	5.853***	8.668***	8.119***
	(1.777)	(1.741)	(1.608)	(1.665)
N	1511			
Akaike Inf. Crit.	3,632.048			

Standard error in brackets

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01



Table 10. Results of the general model for Denmark in log odds

	Sufficient	Low Carbon Footprint, Low Well-Being	Average Carbon Footprint	High Carbon Footprint
Use little resources	-0.352 (0.266)	-0.257 (0.254)	-0.143 (0.240)	-0.243 (0.245)
Possess only few things	-0.195 (0.215)	-0.320 (0.206)	-0.416** (0.193)	-0.330* (0.199)
New things are a waste	-0.107 (0.277)	-0.127 (0.266)	0.079 (0.250)	0.024 (0.256)
Too much in supermarkets	0.148 (0.202)	0.150 (0.196)	0.016 (0.183)	-0.003 (0.189)
Eco-consumer	-0.185 (0.286)	-0.434 (0.273)	-0.391 (0.258)	-0.370 (0.264)
Concerned with environment	-0.323 (0.292)	-0.069 (0.280)	-0.139 (0.264)	-0.244 (0.270)
Embarrassed to have an eco-lifestyle	-0.398** (0.189)	-0.666*** (0.185)	-0.516*** (0.170)	-0.397** (0.176)
Had to reduce expenditure for basics	0.543 (0.435)	1.009** (0.412)	0.973** (0.389)	1.046*** (0.401)
Unable to afford unexpected expense	-0.001 (0.648)	0.136 (0.593)	0.010 (0.579)	0.023 (0.594)
Could not afford a week's holiday	0.660 (0.586)	1.739*** (0.538)	1.110** (0.525)	1.315** (0.536)
Receive governmental support	-0.357 (0.490)	0.327 (0.461)	0.036 (0.442)	-0.257 (0.461)
Instable income	-0.029 (0.529)	-0.159 (0.504)	-0.249 (0.479)	-0.361 (0.498)
Support social policies	-0.221 (0.263)	-0.337 (0.249)	-0.283 (0.234)	-0.339 (0.240)
Support liberal policies	-0.063 (0.193)	-0.155 (0.184)	0.004 (0.173)	-0.093 (0.178)
Support environmental policies	0.621* (0.324)	-0.065 (0.306)	0.019 (0.289)	0.090 (0.295)
Age	0.035** (0.018)	0.039** (0.017)	0.059*** (0.016)	0.047*** (0.016)
Female (vs. male)	-2.252*** (0.585)	-1.617*** (0.580)	-2.560*** (0.557)	-2.669*** (0.564)
Income per person (in 10T€)	-0.045	-0.093	0.060	0.120



	(0.116)	(0.116)	(0.103)	(0.105)
<b>Vocational training (vs. secondary)</b>	0.262	0.532	0.965*	0.855
	(0.569)	(0.529)	(0.507)	(0.520)
<b>Academic degree (vs. secondary)</b>	0.102	-0.184	0.213	0.125
	(0.491)	(0.470)	(0.444)	(0.461)
<b>Rural (vs. city)</b>	0.794	0.450	0.791	1.533***
	(0.579)	(0.552)	(0.523)	(0.534)
<b>Town (vs. city)</b>	-0.164	-0.328	-0.085	0.539
	(0.443)	(0.418)	(0.388)	(0.402)
<b>House (vs. flat)</b>	-1.252***	-0.588	-0.056	0.319
	(0.463)	(0.439)	(0.415)	(0.432)
<b>Homeowner (vs. tenant)</b>	-0.461	-0.618	-0.640	-0.540
	(0.479)	(0.465)	(0.437)	(0.451)
<b>Retired (vs. full-time)</b>	-0.985	-0.572	-1.217*	-1.607**
	(0.706)	(0.677)	(0.635)	(0.648)
<b>In education (vs. full-time)</b>	-0.0003	-0.531	-0.178	-0.971
	(0.655)	(0.653)	(0.608)	(0.670)
<b>Unemployed (vs. full-time)</b>	-1.717*	0.399	-0.256	-0.290
	(1.038)	(0.780)	(0.754)	(0.777)
<b>Part-time (vs. full-time)</b>	-1.029*	-0.425	-0.945*	-1.114**
	(0.618)	(0.567)	(0.526)	(0.544)
<b>Homemaker (vs. full-time)</b>	-2.642**	-1.126	-1.854**	-1.367*
	(1.225)	(0.802)	(0.750)	(0.762)
<b>Self employed (vs. full-time)</b>	0.513	-0.067	0.094	0.140
	(1.250)	(1.369)	(1.182)	(1.204)
<b>Constant</b>	7.683***	9.984***	9.645***	9.570***
	(2.218)	(2.121)	(2.014)	(2.054)
<b>N</b>	1608			
<b>Akaike Inf. Crit.</b>	3,743.464			

Standard error in brackets  
 \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Table 11. Results of the general model for Italy in log odds

	Sufficient	Low Carbon Footprint, Low Well-Being	Average Carbon Footprint	High Carbon Footprint
Use little resources	0.092 (0.251)	0.232 (0.246)	0.365 (0.229)	0.344 (0.237)
Possess only few things	0.044 (0.237)	-0.171 (0.231)	-0.202 (0.215)	-0.181 (0.221)
New things are a waste	-0.011 (0.238)	0.060 (0.235)	0.035 (0.217)	-0.017 (0.224)
Too much in supermarkets	0.154 (0.214)	-0.008 (0.208)	0.089 (0.193)	-0.009 (0.199)
Eco-consumer	0.029 (0.342)	-0.232 (0.330)	-0.075 (0.308)	-0.384 (0.316)
Concerned with environment	-0.833** (0.361)	-1.423*** (0.350)	-1.203*** (0.329)	-0.899*** (0.337)
Embarrassed to have an eco-lifestyle	-0.066 (0.164)	-0.208 (0.164)	-0.096 (0.148)	-0.126 (0.153)
Had to reduce expenditure for basics	-0.063 (0.487)	0.166 (0.474)	0.222 (0.437)	0.042 (0.453)
Unable to afford unexpected expense	0.231 (0.535)	0.827 (0.514)	0.208 (0.483)	0.587 (0.497)
Could not afford a week's holiday	-0.213 (0.471)	0.726 (0.445)	0.308 (0.419)	0.295 (0.432)
Receive governmental support	-0.161 (0.772)	0.002 (0.714)	-0.122 (0.688)	-0.300 (0.716)
Instable income	0.629 (0.473)	1.065** (0.457)	0.968** (0.432)	1.140*** (0.442)
Support social policies	-0.128 (0.291)	0.008 (0.289)	0.031 (0.265)	-0.066 (0.273)
Support liberal policies	0.393 (0.239)	0.144 (0.234)	0.338 (0.216)	0.322 (0.223)
Support environmental policies	0.257 (0.329)	0.444 (0.324)	0.252 (0.297)	0.176 (0.307)
Age	0.008 (0.018)	0.017 (0.018)	0.028* (0.016)	0.033** (0.017)
Female (vs. male)	-3.147*** (1.058)	-2.837*** (1.056)	-3.752*** (1.039)	-4.206*** (1.043)
Income per person (in 10T€)	0.299	-0.120	0.365*	0.500***



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	(0.204)	(0.213)	(0.188)	(0.192)
<b>Vocational training (vs. secondary)</b>	-0.488	-0.625	-0.638	-0.536
	(0.564)	(0.540)	(0.499)	(0.514)
<b>Academic degree (vs. secondary)</b>	0.046	-0.018	-0.067	0.069
	(0.468)	(0.462)	(0.426)	(0.438)
<b>Rural (vs. city)</b>	0.571	0.563	0.916	1.519*
	(0.936)	(0.905)	(0.861)	(0.870)
<b>Town (vs. city)</b>	-0.335	-0.519	-0.250	0.123
	(0.414)	(0.405)	(0.375)	(0.388)
<b>House (vs. flat)</b>	-0.043	-0.034	0.084	0.188
	(0.440)	(0.430)	(0.397)	(0.408)
<b>Homeowner (vs. tenant)</b>	0.004	-0.319	-0.242	-0.393
	(0.538)	(0.506)	(0.482)	(0.495)
<b>Retired (vs. full-time)</b>	0.337	1.430*	0.829	0.412
	(0.850)	(0.819)	(0.764)	(0.779)
<b>In education (vs. full-time)</b>	1.404	1.250	0.960	0.360
	(0.904)	(0.912)	(0.860)	(0.914)
<b>Unemployed (vs. full-time)</b>	1.029	1.725*	0.918	0.654
	(0.963)	(0.904)	(0.877)	(0.904)
<b>Part-time (vs. full-time)</b>	1.457*	1.595**	1.153	1.134
	(0.763)	(0.754)	(0.712)	(0.730)
<b>Homemaker (vs. full-time)</b>	0.581	0.780	-0.055	0.007
	(0.593)	(0.571)	(0.519)	(0.551)
<b>Self employed (vs. full-time)</b>	0.625	0.486	0.011	0.008
	(0.743)	(0.770)	(0.696)	(0.711)
<b>Constant</b>	6.249**	9.055***	9.175***	9.718***
	-2.730	-2.700	-2.602	-2.635
<b>N</b>	1362			
<b>Akaike Inf. Crit.</b>	3,305.195			

Standard error in brackets  
 \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

Table 12. Results of the general model for Latvia in log odds

	Sufficient	Low Carbon Footprint, Low Well-Being	Average Carbon Footprint	High Carbon Footprint
Use little resources	-0.420 (0.316)	-0.322 (0.309)	-0.215 (0.292)	-0.165 (0.301)
Possess only few things	-0.291 (0.318)	-0.358 (0.310)	-0.328 (0.290)	-0.401 (0.299)
New things are a waste	0.144 (0.306)	-0.008 (0.296)	-0.081 (0.278)	-0.071 (0.286)
Too much in supermarkets	-0.141 (0.262)	-0.299 (0.254)	-0.254 (0.239)	-0.345 (0.247)
Eco-consumer	-0.002 (0.399)	-0.875** (0.385)	-0.708* (0.363)	-0.707* (0.373)
Concerned with environment	-0.359 (0.413)	0.098 (0.403)	0.016 (0.382)	0.105 (0.392)
Embarrassed to have an eco-lifestyle	-0.075 (0.215)	-0.226 (0.213)	0.012 (0.191)	-0.074 (0.200)
Had to reduce expenditure for basics	0.102 (0.512)	0.949* (0.507)	0.632 (0.459)	0.723 (0.479)
Unable to afford unexpected expense	0.570 (0.589)	0.819 (0.560)	0.482 (0.532)	0.650 (0.551)
Could not afford a week's holiday	0.005 (0.517)	0.807 (0.491)	0.432 (0.463)	0.338 (0.482)
Receive governmental support	-1.176* (0.677)	-0.760 (0.610)	-0.755 (0.553)	-0.195 (0.577)
Instable income	0.116 (0.665)	0.103 (0.630)	0.041 (0.603)	-0.035 (0.627)
Support social policies	-0.320 (0.362)	0.059 (0.350)	-0.050 (0.330)	-0.0001 (0.340)
Support liberal policies	-0.105 (0.320)	-0.213 (0.313)	-0.157 (0.288)	-0.283 (0.296)
Support environmental policies	0.344 (0.407)	-0.407 (0.386)	-0.205 (0.364)	-0.359 (0.374)
Age	0.005 (0.019)	0.034* (0.019)	0.015 (0.017)	0.014 (0.018)
Female (vs. male)	-4.535*** (0.894)	-4.293*** (0.886)	-5.934*** (0.869)	-6.761*** (0.874)
Income per person (in 10T€)	0.248	-0.028	0.955**	1.556***





	(0.542)	(0.551)	(0.487)	(0.503)
<b>Vocational training (vs. secondary)</b>	-0.078	-0.944	-0.528	-0.801
	(0.768)	(0.734)	(0.709)	(0.739)
<b>Academic degree (vs. secondary)</b>	-0.041	-0.816	-0.229	0.141
	(0.628)	(0.596)	(0.572)	(0.593)
<b>Rural (vs. city)</b>	0.103	-0.624	-0.593	-0.694
	(0.541)	(0.522)	(0.486)	(0.506)
<b>Town (vs. city)</b>	-0.461	-1.082*	-1.001*	-0.767
	(0.604)	(0.583)	(0.533)	(0.553)
<b>House (vs. flat)</b>	0.369	0.628	0.034	0.643
	(0.515)	(0.508)	(0.475)	(0.491)
<b>Homeowner (vs. tenant)</b>	0.315	-0.072	0.487	0.410
	(0.608)	(0.580)	(0.547)	(0.571)
<b>Retired (vs. full-time)</b>	0.154	0.225	0.210	-0.440
	(0.720)	(0.697)	(0.653)	(0.688)
<b>In education (vs. full-time)</b>	0.328	-0.071	-0.353	-0.494
	(1.449)	(1.431)	(1.334)	(1.419)
<b>Unemployed (vs. full-time)</b>	-0.099	1.071	0.369	0.717
	(0.975)	(0.885)	(0.846)	(0.875)
<b>Part-time (vs. full-time)</b>	0.314	1.126	0.987	1.256
	(0.938)	(0.894)	(0.844)	(0.869)
<b>Homemaker (vs. full-time)</b>	4.940***	5.745***	5.900***	5.647***
	(0.588)	(0.420)	(0.327)	(0.461)
<b>Self employed (vs. full-time)</b>	3.704***	4.523***	4.168***	4.506***
	(0.581)	(0.407)	(0.289)	(0.323)
<b>Constant</b>	13.060***	16.140***	18.830***	19.370***
	-1.104	(0.905)	(0.644)	(0.748)
<b>N</b>	1067			
<b>Akaike Inf. Crit.</b>	2,537.512			

Standard error in brackets  
\*p<0.1; \*\*p<0.05; \*\*\*p<0.01



Table 13. Results of the general model for France in log odds

	High Carbon Footprint	Low Carbon Footprint	Low Carbon Footprint in all Activities
<b>Use little resources</b>	-0.050	-0.058	0.248
	(0.088)	(0.102)	(0.153)
<b>Possess only few things</b>	-0.006	0.099	0.181
	(0.088)	(0.102)	(0.147)
<b>New things are a waste</b>	-0.092	-0.006	0.038
	(0.088)	(0.102)	(0.143)
<b>Too much in supermarkets</b>	-0.044	-0.162*	-0.171
	(0.083)	(0.093)	(0.134)
<b>Eco-consumer</b>	-0.133	-0.014	0.075
	(0.102)	(0.116)	(0.157)
<b>Concerned with environment</b>	0.035	0.118	-0.087
	(0.102)	(0.121)	(0.167)
<b>Embarrassed to have an eco-life-style</b>	0.007	-0.090	0.047
	(0.065)	(0.074)	(0.098)
<b>Had to reduce expenditure for basics</b>	-0.099	-0.259	0.041
	(0.155)	(0.179)	(0.254)
<b>Unable to afford unexpected expense</b>	-0.373**	0.080	-0.236
	(0.183)	(0.199)	(0.275)
<b>Could not afford a week's holiday</b>	0.375**	0.094	-0.433*
	(0.160)	(0.182)	(0.258)
<b>Receive governmental support</b>	0.002	-0.037	0.170
	(0.193)	(0.211)	(0.271)
<b>Instable income</b>	0.028	0.168	0.105
	(0.191)	(0.211)	(0.285)
<b>Support social policies</b>	0.061	0.059	-0.040
	(0.081)	(0.098)	(0.153)
<b>Support liberal policies</b>	-0.049	-0.130	0.013
	(0.076)	(0.087)	(0.136)
<b>Support environmental policies</b>	-0.128	0.126	0.015
	(0.091)	(0.109)	(0.167)
<b>Age</b>	0.017**	0.007	-0.019*
	(0.007)	(0.008)	(0.011)
<b>Female (vs. male)</b>	-0.376***	1.150***	3.531***
	(0.144)	(0.170)	(0.597)
<b>Income per person (in 10T€)</b>	0.167***	0.059	-0.103
	(0.056)	(0.068)	(0.110)
<b>Vocational training (vs. secondary)</b>	-0.082	-0.002	0.232
	(0.197)	(0.216)	(0.301)
<b>Academic degree (vs. secondary)</b>	0.043	-0.155	-0.260
	(0.158)	(0.183)	(0.270)
<b>Rural (vs. city)</b>	0.465***	0.112	-0.336



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	(0.166)	(0.193)	(0.283)
<b>Town (vs. city)</b>	0.294	-0.035	-0.251
	(0.187)	(0.217)	(0.305)
<b>House (vs. flat)</b>	0.305*	-0.236	-0.093
	(0.171)	(0.190)	(0.275)
<b>Homeowner (vs. tenant)</b>	0.147	-0.076	0.226
	(0.171)	(0.191)	(0.272)
<b>Retired (vs. full-time)</b>	-0.541**	0.632**	0.315
	(0.213)	(0.258)	(0.430)
<b>In education (vs. full-time)</b>	0.621	0.507	0.009
	(0.438)	(0.505)	(0.640)
<b>Unemployed (vs. full-time)</b>	-0.893**	0.686**	0.050
	(0.423)	(0.330)	(0.514)
<b>Part-time (vs. full-time)</b>	-0.220	-0.164	-0.163
	(0.278)	(0.309)	(0.368)
<b>Homemaker (vs. full-time)</b>	-0.500	0.150	0.531
	(0.408)	(0.354)	(0.380)
<b>Self employed (vs. full-time)</b>	-0.577	-0.385	0.204
	(0.458)	(0.521)	(0.558)
<b>Constant</b>	-0.327	-3.357***	-8.157***
	(0.623)	(0.746)	(1.501)
<b>N</b>	1508		
<b>Akaike Inf. Crit.</b>	3,378.962		

Standard error in brackets  
 \*p<0.1; \*\*p<0.05; \*\*\*p<0.01





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