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Wellbeing, energy futures and everyday life (WEFEL): Consumer-citizen engagement towards defining the good life in future energy pathways

Planning for the good life - the significance of sufficiency, wellbeing, and collective solutions for sustainable energy futures.

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Zusammenfassung

Die Energiewende und die Klimakrise erfordern ein Umdenken in der Art und Weise, wie wir überall auf der Welt produzieren und konsumieren. Die Schweiz hat sich 2017 zusammen mit 192 anderen Staaten und der EU im Pariser Abkommen verpflichtet, den Ausstoss von Klimagasen zu reduzieren. Mit dem Klima und Innovationsgesetz gibt sich das Land für die Sektoren Gebäude, Verkehr und Industrie klar definierte Absenkpfade. Unter dem Strich soll die Schweiz bis 2050 klimaneutral werden. Wie dieses Ziel erreicht werden kann, zeigen Energieszenarien wie die Energieperspektiven 2050+. Viele dieser Energieszenarien zielen darauf ab, die technischen Möglichkeiten im Energiesystem zu beschreiben, mit denen das Netto-Null-Emissionsziel erreicht werden kann. Wenige integrieren Aenderungen im Lebensstyl und Suffizienzüberlegungen. Zudem fehlen explizite Beschriebe, wie die Menschen im Jahr 2050 leben und konsumieren werden. So istfür die Bürgerinnen und Bürger nicht ersichtlich, wie durch Aenderungen von alltäglichen Praktiken der Energiebedarf gesenkt werden kann. Was für die Menschen wichtig ist, ist nicht die Energie an sich, sondern die Möglichkeit, ein gutes Leben zu führen. Das Hauptziel des Projekts ist es, zu verstehen, wie Energieszenarien mit dem menschlichen Wohlbefinden und dem Alltagsleben in der Schweiz zusammenhängen, um die Verbraucher und Bürger für eine nachhaltigere Energiezukunft zu gewinnen. Ausgehend von verschiedenen Energieszenarien für die Schweiz werden drei Hauptfragen behandelt: 1. Wie können Energiepfade in Alltagssituationen übersetzt werden, die für verschiedene Schweizer Verbraucher und Bürger zugänglich und nachvollziehbar sind? 2. Wie können positive und negative Kompromisse quantifiziert und qualifiziert werden, unter Berücksichtigung von Rebound-Effekten? 3. Wie stellen sich die Schweizer Bürgerinnen und Bürger den Übergang zu einer nachhaltigen Energiezukunft in Bezug auf ihr tägliches Leben und ihr Wohlbefinden vor?

Unser Beitrag ist methodischer und empirischer Natur und für die öffentliche Politik von Interesse. Der Bericht stellt die wichtigsten Ergebnisse der Workshops vor, die 154 Teilnehmer (Bürger, Arbeitnehmer, Energiedienstleister usw.) zusammenbrachten und eingehende Diskussionen über die Energiewende unter dem Gesichtspunkt der Alltagsdynamik und des Wohlbefindens ermöglichten. In diesem Bericht werden drei Arten von Beiträgen aus dem Projekt entwickelt. Erstens der methodische und konzeptionelle Beitrag: Die eingehenden Diskussionen während der Workshops führten dazu, dass die Bürgerinnen und Bürger Debatten über die Energiewende führten und sich fragten, ob sich die Veränderungen im Alltag und die daraus resultierenden Energieeinsparungen lohnen, wenn es um die Befriedigung der menschlichen Bedürfnisse geht. Der Beitrag ist auch empirisch: Die Ergebnisse des Workshops zeigen die kollektiven Veränderungen auf, die heute stattfinden müssen, um eine Energiewende zu unterstützen, die dem menschlichen Wohlbefinden in der Zukunft Rechnung trägt. Nicht alle Bürger müssen ihren Verbrauch in gleicher Weise ändern, und es ist wichtig, das Potenzial für Energieeinsparungen nach Einkommensquintilen zu differenzieren. Auch der politische Beitrag des Projekts wird hervorgehoben: Die Ergebnisse der Workshops zeigen, wie wichtig kollektive und institutionelle Veränderungen sind, die einen Wandel der Alltagspraktiken erleichtern würden. Solche Veränderungen müssen auch Fragen der sozialen Gerechtigkeit berücksichtigen, da nicht alle Menschen heute, je nach Einkommensquintil, auf die gleiche Weise konsumieren und nicht alle Menschen über die gleichen Ressourcen verfügen, um Veränderungen herbeizuführen.

Résumé

La transition énergétique et la crise climatique nous obligent à repenser nos modes de production et de consommation dans le monde entier. En 2017, la Suisse s'est engagée, avec 192 autres pays et l'UE, à réduire les émissions de gaz à effet de serre dans le cadre de l'Accord de Paris. Avec la loi sur le climat et l'innovation, le pays s'est fixé des trajectoires de réduction clairement définies pour les secteurs des bâtiments, des transports et de l'industrie. Au final, la Suisse devrait devenir neutre sur le plan climatique d'ici 2050. Des scénarios énergétiques tels que les Perspectives énergétiques 2050+ montrent comment cet objectif peut être atteint. De nombreux scénarios énergétiques visent à décrire les possibilités techniques du système énergétique permettant d'atteindre l'objectif d'émissions nettes nulles. Peu d'entre eux intègrent les changements de mode de vie et des considérations pour la sobriété. Il n'existe pas non plus de descriptions explicites de la manière dont les gens vivront et consommeront en 2050. Par exemple, les citoyen.ne.s ne voient pas clairement comment la consommation en énergie peut être réduite en changeant les pratiques quotidiennes. Ce qui est important pour les individus, ce n'est pas l'énergie en tant que telle, mais les services qu'elle fournit et la manière dont ces services permettent de mener une bonne vie. L'objectif principal du projet est de comprendre comment les scénarios énergétiques sont liés au bien-être humain et à la vie quotidienne en Suisse, afin d'impliquer les consommateurs.trices et les citoyen.ne.s dans un avenir énergétique plus durable. Sur la base de différents scénarios énergétiques pour la Suisse, trois questions principales seront abordées : 1. Comment les trajectoires énergétiques issus de scénarios peuvent-elles être traduites en situations de la vie quotidienne, accessibles aux divers consommateurs.trices et citoyen.ne.s suisses ? 2. Comment quantifier et qualifier les compromis positifs et négatifs entre les économies d'énergie et le bien-être, tout en tenant compte des effets de rebond ? 3. Comment divers consommateurs.trices et citoyen.ne.s suisses imaginent-iels une transition vers un avenir énergétique durable en relation avec leur vie quotidienne et leur bien-être ?

Notre contribution à ce rapport final est méthodologique, empirique et d'intérêt pour les politiques publiques. Le rapport présente les principaux résultats des ateliers qui ont réuni 154 participant.es (citoyen.nes, travailleur.euses, fournisseurs de services énergétiques, etc.) et ont permis des discussions approfondies sur la transition énergétique du point de vue des dynamiques quotidiennes et du bien-être. Trois types de contributions du projet sont développés dans ce rapport. Tout d'abord, l'apport **méthodologique et conceptuel** : les discussions approfondies menées lors des ateliers ont amené les citoyen.nes à s'engager dans des débats sur la transition énergétique et à se demander si les changements apportés à la vie quotidienne et les économies d'énergie qui en découlent valent la peine, lorsqu'il s'agit de satisfaire les besoins humains. La contribution est également **empirique** : les résultats de l'atelier mettent en évidence les changements collectifs qui doivent avoir lieu aujourd'hui pour soutenir une transition énergétique qui prenne en compte le bien-être humain à l'avenir. Tous les citoyen.ne.s ne doivent pas modifier leur consommation de la même manière et il est pertinent de différencier le potentiel d'économies d'énergie par quintile de revenu. La contribution du projet en lien avec les **politiques publiques** est également soulignée : les résultats des ateliers montrent l'importance des changements collectifs et institutionnels, qui faciliteraient les changements dans les pratiques quotidiennes. Ces changements doivent également prendre en compte les questions de justice sociale, car tout le monde ne consomme pas de la même manière aujourd'hui, en fonction du quintile de revenu, et tout le monde n'a pas les mêmes ressources nécessaires face à la nécessité de changement.

Summary

The energy transition and climate crisis require a new ways of producing and consuming over the world. In 2017, Switzerland, together with 192 other countries and the EU, committed to reducing greenhouse gas emissions in the Paris Agreement. With the Climate and Innovation Act, the country has set itself clearly defined reduction paths for the buildings, transport and industry sectors. The bottom line is that Switzerland should become climate-neutral by 2050. Energy scenarios such as the Energy Perspectives 2050+ (Prognos AG et al., 2020) show how this goal can be achieved. Many energy scenarios aim to describe the technical possibilities in the energy system with which the net-zero emissions target can be achieved. Few integrate lifestyle changes and sufficiency considerations. There are also no explicit descriptions of how people will live and consume in 2050. For example, it is not clear to citizens how energy requirements can be reduced by changing everyday practices. What is important to people is not the energy itself, but the services that energy provides, and how these services create opportunity to lead a good life. The main objective of the project is to understand how energy scenarios relate to human well-being and everyday life in Switzerland in order to engage consumers and citizens in a more sustainable energy future. Based on different energy scenarios for Switzerland, three main questions will be addressed: 1. How can energy pathways be translated into everyday life situations, accessible and relatable to diverse Swiss consumer-citizens? 2. How can positive and negative trade-offs between energy saving and wellbeing be quantified and qualified, while accounting for rebound effects? 3. How do Swiss citizens imagine a transition to sustainable energy futures in relation to everyday lives and wellbeing?

Our contribution is methodological, empirical and of interest to public policy. The report presents the main results of workshops, which brought together 154 participants (citizens, workers, energy service providers, etc.) and enabled in-depth discussions on the energy transition from the point of view of everyday dynamics and well-being. Three types of contribution from the project are developed in this report. Firstly, the **methodological and conceptual** contribution: the in-depth discussions held during the workshops led citizens to engage in debates on the energy transition and to ask themselves whether the changes made to everyday life and the resulting energy savings are worthwhile, when it comes to satisfying human needs. The contribution is also **empirical**: the results of the workshop highlight the collective changes that need to take place today to support an energy transition that takes account of human well-being in the future. Not all citizens need to change their consumption in the same way and it is relevant to differentiate the potential for energy savings by income quintile. The **political** contribution of the project is also highlighted: the results of the workshops show the importance of collective and institutional changes, which would facilitate changes in everyday practices. Such changes must also account for questions of social justice, as not all people consume the same way today, depending on income quintile, and not all people have the same resources necessary for bringing about change.

Key findings

Five key findings highlight the significance of studying the energy transition in relation to human wellbeing and needs satisfaction.

1. **Considering sufficiency and wellbeing for the energy transition:** Combined with energy efficiency measures and renewable energy production, energy sufficiency also has a high potential when it comes to the energy transition in Switzerland. The sufficiency measures studied in the project could translate into a reduction of 35% in the direct energy consumption of households in 2035, compared to 2019. This potential reduction in household energy consumption in 2035 corresponds to approximately 16% of total final energy consumption in 2019, including building, transportation and industry. In comparison, the ZERO-Basis scenario of the Swiss Energy Perspectives 2050+ estimates a total reduction of 17% in total final energy consumption from technical measures, for all sectors over the same time period. The aggregated results were calculated based on changes in practices for an average household, i.e., middle income quintile. The sufficiency measures were discussed as plausible and desirable in the workshops organized as part of the WEFEL project and would also generally lead to human need satisfaction – or the ability for people to satisfy their needs, such as feeling protected in society, or having a voice and participating in society, among others. Therefore, less energy usage could be compatible with high wellbeing, understood as human need satisfaction.

2. **Identifying promising and synergic satisfiers**: The workshops stimulated discussions around examples of practices that are plausible, have a real potential in terms of energy savings for the future, and can satisfy several human needs (e.g. protection, affection, idleness, freedom, etc.) at the same time (i.e., synergic satisfiers). The satisfiers that allow for the satisfaction of several needs at the same time are known as a 'synergic satisfiers', and several synergic satisfiers for the Swiss energy transition were identified through workshop discussions, such as reducing living spaces (meeting needs for participation and affection), or shifting to public transport (meeting needs for subsistence and protection). These can be termed sufficiency-oriented practices, as they lead to reduced energy usage while also meeting human needs. Additional synergic and sufficiency-oriented practices were identified by the workshops participants, which potentials are not easy to measure, such as: sharing spaces and creating local spaces (meeting needs for subsistence, participation, and identity) or working less (meeting needs for leisure and creative expression). Working less also allows people to engage in other sufficiency practices that are time intensive, as detailed in the paragraph below.

3. **Recognizing inequalities in the face of change**: Workshop participants recognized not all Swiss people need to change their practices in the same way: there are clear differences between high- and low-income households when it comes to several consumption domains that use energy, such leisure activities and mobility. Changes in practices of high-income households in select domains would clearly contribute to a greater reduction in overall energy consumption than similar changes among low-income households. Participants also recognized that people do not have access to the same resources, either financial, material (equipment, infrastructures), time availability, or in relation to skills and competencies. As such, more collective approaches to change would be necessary, as is already the case with State support for building renovations and public transportation. Under certain conditions, State support for building renovations would help reduce inequalities rather than profit landlords only. Precarious households are often tenants and spend a higher proportion of their disposable income on heating than wealthier

households.

4. **Addressing the complexity of change and interrelation of practices:** While promising, synergic satisfiers have been identified (point 2 above), our study demonstrates that changes in practices are complex. Practices are inter-related: for example, food provisioning is often linked to mobility, or heating is linked to building infrastructures. One change that could *prefigure* other changes is that of access to free time: having time to invest in changing food consumption or mobility patterns was seen as important by workshop participants. This relates to more structural changes that would need to emerge in the workplace: participants felt (in discourse, if not in practice) that less work time could potentially free up time for engaging in less energy intensive practices and in the collective action necessary to bring about broader changes. Another prefigurative change around reduced living space would be the availability of more shared spaces in residential buildings or neighborhoods, where people can meet their needs (e.g., for working space, guest rooms, recreational spaces, etc.).

5. **Supporting synergic collective changes for a just transition**: The personas exemplify a way of living in 2035 that is made possible because of collective decisions that were taken beforehand. In the discussions with participants, an emphasis was given to collective changes that would be necessary today to support the energy transition. However, what emerged from our workshop was the importance not only of collective forms of change, but also of a more just transition. As not everyone has the same levels of consumption and resources to bring about change, a nuanced approach is necessary – one that accounts for differences in income (as a proxy for energy usage), and differences in access to resources and competencies (including know-how, financial resources, time, cultural capital, etc.). A more just transition implies considering how needs can be met for the most people possible, considering differences between social groups, and through synergic satisfiers that are planned for at the collective level.

Contents

1. Introduction

1.1 Background information

In Switzerland, a new climate and innovation act was voted in June 2023, with the goal of reaching climate neutrality by 2050, in order to ensure climate protection, as well as a reduced dependence on foreign oil and natural gas. This act does not specify any bans on natural resources use, and mostly focuses on incentives around technological changes. Many energy scenarios show possible future energy systems compatible with the net zero emissions target. The majority focus on technological measures to transform the energy system, and some also integrate reductions in energy demand.The latest Swiss Energy Perspectives , designed in 2020 (Prognos AG et al., 2020), aim at describing the mainly technical possibilities with which the net-zero target can be achieved in the Swiss energy system, as a basis for developing transition strategies. The scenario includes information about the technological transformation that has to be implemented, but does not address changes in consumption patterns directly. Even when considering scenarios that do engage with energy demand, most remain abstract in relation to how energy is used. Energy is tied up with everyday lives, from preparing a meal, to keeping warm, or getting around, and how such scenarios relate to everyday life and resulting tradeoffs between human wellbeing and energy savings should be further explored. In Switzerland, in 2020, households were responsible for one third of final energy usage (OFS 2022), 11% for transport and 22% for heating and other uses[1]. However, energy use is more than the direct purchase of fuels and electricity: household consumption domains relate to significant indirect energy use and emissions (Pang et al. 2019). Yet how to engage households in a more sustainable energy transitions is less clear. Recent SNSF NRP71 research has demonstrated that energy in and of itself is not significant to everyday people (Sahakian and Bertho 2018), and that the dual role of people as consumers and citizens can trigger different ways of thinking and acting (Defila et al 2018). Due to recent geo-political events, such as the war in Ukraine, energy might have become more topical in Switzerland, but in general it is less meaningful than the *services* that it provides and the resulting human needs that are satisfied. Researchers are increasingly turning to a practice-theoretical framework for understanding energy services as tied up with everyday life, such as getting around, preparing a meal, or being comfortable at home (Sahakian 2019; Shove and Walker 2014; Wilhite 2016). These routinized and habitual activities, which draw on direct and indirect energy sources, are more meaningful to people than 'energy' in and of itself (Sahakian 2019). In consumption studies, the question of everyday life in relation to energy usage is a growing field of inquiry and action-research (Sahakian et al 2021).

Environmental impacts in priority areas such as food, mobility, and housing (Tukker et al 2006) have long been the starting point of sustainability studies. In addition, there is increasing recognition that human wellbeing must be a central consideration, particularly the links between energy usage, carbon emissions, and wellbeing (Lamb and Steinberger 2017; Rao and Min 2017; O'Neill et al 2018; Jackson 2017; Steinberger et al 2020). The vast literature on human wellbeing draws from different conceptual approaches, ranging from Nussbaum's capabilities (2003) to Max-Neef's needs (1991). While subjective wellbeing has been studied in relation to energy provisioning in Switzerland (Welsch et al. 2014; Ecoplan project on wellbeing), an objective and eudaimonic approach to wellbeing goes beyond notions of happiness or life satisfaction to reflect on human needs such as participation in society (Doyal and Gough 1991, Di Giulio and Defila 2019). A distinction is made between human needs and the pathways necessary to achieving them, emphasizing the significance of 'satisfiers' for meeting needs,

[1] See Energy accounts (FSO 2023), eurostat methodology based on the GEST data. Final energy use is calculated on the principle of causality and transport of goods is allocated to sectors, and transport of persons to households. Yet this excludes indirect energy from the imports of goods.

which are context dependent (Max-Neef et al. 1991). It becomes all the more relevant to consider whether energy pathways can lead to 'need satisfaction', in two ways: by hypothesizing around trade-offs and co-benefits in relation to the different pathways, and by engaging people towards uncovering how they relate pathways to wellbeing in their lives. For the former, a body of literature points to correlations between certain forms of consumption and energy usage: e.g., household size and location can have an impact on energy usage and emissions (Ottelin et al. 2019, Pang et al. 2019). Whether reduced energy usage can lead to human need satisfaction and sustainable wellbeing remains to be studied in different contexts and settings.

Links between energy pathways, everyday life, tradeoffs and wellbeing can be discussed through participatory methods or trans-disciplinary research, which involve working collaboratively and integrating knowledge across different disciplines and areas of experience/expertise (Defila and Di Giulio 2015). The premise is that such forms of research could lead to more innovative solutions, critical to sustainability research and specifically energy studies (Fahy and Rau 2013). Such approaches have been explored in relation to back-casting in transition studies (Kerkhof and Wieczorek 2005), or in the generation of desirable futures or visioning (Quist and Vergragt 2006; Davies et al. 2012). Personas from the future have also been used to debate transitions towards 2050 sustainable lifestyles (Guillen and Nicolau 2013; Villeneuve et al. 2020). Engaging everyday people in reflecting on energy futures relates to a body of literature on future imaginaries in the field of socio-technical studies (Jasanoff and Kim, 2009; 2015; Braunreiter et al. 2020). There are multiple and competing imaginaries in society, which shed light on how different groups of consumer-citizens understand their role in energy transitions. Pathways to 'sustainable' energy transitions have been developed as part of the SCCR CREST Visions 2050 process and were used in a participatory workshop Charting Pathways for the Swiss Energy Transition (Blumer et al 2019). Social practice theoretical reflections contribute in three ways to this literature: conceptually, in recognizing the future orientation of teleoaffectivities; methodologically, for describing personas engaged in future practices; and towards reflexivity, in how imagining futures might affect social practices today (Sahakian et al 2023).

Starting with the official scenarios towards net zero for Switzerland, the energy perspectives 2050+ (EP2050+), we then reviewed several other scenarios which include varying degrees of changes at the household level. Indeed, the EP2050+ scenario focuses on efficiency gains and the deployment of renewables, albeit with demand side management. However, changes that directly relate to demand-side measures are mostly absent from this scenario, which could include for example changes to food consumption patterns. For our purpose, and in order to evaluate the potential changes in everyday life, we turned to scenarios that include the different consumption domains that are most significant when it comes to household energy usage, involving energy usage both inside the home (heating, cooking, etc.) and outside of the home (mobility). We aimed to consider not only the deployment of efficiency measures and renewable energies, but also what are termed 'sufficiency' measures defined in the 6th Assessment report of the IPCC as "a set of measures and daily practices that avoid demand for energy, materials, land and water while delivering human well-being for all within planetary boundaries" (IPCC, 2022, 31).

The IPCC is clear on the need for efficiency measures as well as the deployment of renewable energy. But for the first time, so-called 'demand-side' measures were given more prominence in the 6th Assessment report, including the reduction or avoidance of demand (termed 'sufficiency'). This is relevant for several reasons. First, at the global level, sufficiency is important in relation to the climate urgency: every emission and every gram of CO2 counts, and it is crucial to try to reach the targets as soon as possible. Then, climate issues are not confined to Switzerland, and meeting the minimum

national targets is not enough: we may have less emissions in the country, but we still need to be more ambitious and consider indirect emissions elsewhere (e.g., the example of reducing sqm for housing is an interesting one: less sqm means less concrete and less embodied energy). Another argument is that at the country level – but more broadly everywhere - the more we reduce how much we consume, the more we can safely ensure energy supply for all – now and in the future. Finally, as the WEFEL personas present alternative futures living in 2035 (on the way to 2050 targets), full technological developments to attain zero emissions have yet to be realized; reducing demand is thus presented as a step towards the 2050 goal.

To represent a future where Switzerland is on the way to net zero emissions, we built on the Swiss EP2050+ , but also engaged with other scenarios that focused on consumption, demand or sufficiency more explicitly. We used the decarbonization scenario from the negaWatt association, which is estimated for Switzerland and other EU countries (Moreau, Principi and Ravalet 2021), including assumptions about sufficiency, efficiency and renewable energy. A global Decent Living Energy (DLE, Millward-Hopkins et al. 2020) scenario evaluates the satisfaction of basic needs for all in a decarbonized world. This does not a priori exclude any household practices such as flying, but scales activities by what is needed to live a decent life (Rao et Min 2017) – understood as related to needs satisfaction and decent living standards. At the European or Swiss scale, this means a reduction in living space (which can be achieved by 2050 for all inhabitants, which will most likely not be the case for efficient buildings and district heating), and fewer and less frequent km traveled by car or plane. We also investigated two additional scenarios, the EU's long-term strategy with emphasis on behavioral change, 1.5LIFE, and the SPREAD, focusing on the unsustainable lifestyle impacts to be overcome by 2050, and proposing two out of four sub scenarios around more collective actions and collaboration. The combination of the assumptions led to the development of personas that represent lifestyles with technical changes in energy generation and use (renewables and efficiency) as well as non-technical changes at the scale of the household (Costa et al. 2021), involving sufficiency measures (e.g., reductions in meat consumption, living or working space, temperatures, km travelled, etc.).

Based on these different scenarios, we translated their underlying assumptions into practices performed by fictive personas living in Switzerland in 2035. We designed 5 personas addressing various domains and dynamics of consumption: food, heating and cooling, mobility, work life, sharing spaces and appliances. The aim of the personas was to have a new visual representation of energy futures, or a new narrative that would be more compelling when it comes to engaging citizens (understood as people who engage with the society in which they live, regardless of nationality) in participatory methods, such as workshop discussions. The personas were meant to represent different profiles in order for the participants to be able to identify to them and their lifestyles. However, and crucially, these daily lives also describe various collective changes that would have to happen beforehand, for these future practices to be performed. Once a first version of the personas was designed, the research team conducted various consultations with user experts and certified experts in various domains (food, energy services, etc.), including citizens, practitioners and academics. A final version of the personas was designed, and calculations were made on the energy savings potentials that these personas' everyday practices represented. The personas and the calculations were then presented to participants in participatory workshops. Seven workshops were conducted between May 2022 and March 2023, gathering more than 150 participants. Recognizing that the overall energy savings of all five personas combined was lacking, these calculations and graphic representations were also added near the end of the project, to be included in the final WEFEL Tool Kit – a guide to conducting the workshops. The discussions were fruitful and resulted in key findings, detailed below (section 3).

1.2 Purpose of the project

The main objective of this research was to uncover how everyday people in Switzerland, in their dual role of consumer-citizens, can be engaged in planning for energy futures that represent 'sustainable wellbeing', understood as human need satisfaction with reduced carbon emissions. We started from the assumption that energy scenarios, perspectives and pathways are often abstract and difficult for people to relate to; we assume that people can engage in discussions and debates around societal wellbeing, and that they can make a clear link between wellbeing and energy provisioning and usage; further, we hypothesized that reduced energy usage could potentially result in high wellbeing and we sought to understand how people relate to this conception in the future.

Objectives

In light of the net zero emission target for Switzerland, this project asks the main question: In what way can energy futures be made relevant to everyday life activities and the wellbeing of consumer-citizens? Leading to three interrelated questions that are presented below. The approach envisioned as well as the way we operationalized the approach to test the hypothesis are also detailed.

WP1: How can illustrative energy pathways be translated into everyday life situations, accessible and relatable to Swiss consumer-citizens?

> ***Assumption***: energy scenarios can be abstract and difficult to relate to, but can be translated into narratives about 'sustainable' pathways that are more relevant to people.
>
> ***Approach***: drawing from advances in the sociology of consumption, engage in a social practice theoretical approach towards identifying everyday practices (e.g., getting around, preparing food, heating homes, etc.) that relate to sustainable energy pathways. As not all income quintiles need to change patterns of energy usage in the same way, account for socio-economic differences.
>
> ***Operationalization****: various energy scenarios have been analyzed and translated into assumptions about everyday practices from the future. Those assumptions have then been related to the various elements of practices that shape them: material arrangements, skills and competencies, norms, etc.*

WP2: How can the positive and negative trade-offs around energy futures be quantified and qualified, including rebound effects?

> ***Assumption:*** energy pathways involve positive and negative trade-offs, in terms of energy savings and human wellbeing, which are not obvious and would benefit from discussions with consumer-citizens.
>
> ***Approach***: simulate the implications of changes in mobility, food, and housing at the household level based on energy pathways, identifying trade-offs, both positive and negative, in satisfying human needs under the constraints set by the EP2050+ (in energy, technical, and economic terms).
>
> ***Operationalization****: calculation of energy savings potential for each persona in relation to their everyday consumption practices, per income quintile. Potential savings are estimated in relation*

to energy consumption reduction per consumption domain, and in relation to percentage of reduction within the overall energy budget.

WP3: How do Swiss citizens imagine a transition to these energy futures in relation to their everyday lives and wellbeing?

Assumption: everyday people can reflect on human needs and trade-offs in relation to wellbeing and energy services, towards charting transitions towards more 'sustainable' energy futures.

Approach: through participative methods and trans-disciplinary research, co-develop new knowledge that challenges assumptions about everyday life and energy futures for ''sustainable wellbeing'.

Operationalization*: conduct of participatory workshops in Switzerland with consumer-citizens to discuss the future imaginaries and personas created, in relation to the good life* and energy savings.

1.3 Conceptual framework

The project relies on an original conceptual framework, which seeks to understand energy usage in relation to everyday social practice, and that links sustainability as a normative aim to that of human wellbeing, understood as human needs satisfaction.

In relation to social practices, we aimed to recognize the ways in which everyday life practices are embedded in broader, collective ways of doing, which involve material arrangements, skills and competencies, but also normative understandings of how things ought or should be. A social practice approach moves away from an over-individualization of consumption, to consider the ways in which consumption is rooted in everyday life dynamics (Shove et al 2012). We used practice theory in various ways, for this project, as detailed in Sahakian et al (2023): first, we describe everyday life in an energy transition as a future social practice. This means that we engage with the descriptive quality of practice theory to describe changes in the future, which are represented by technological changes or changes in infrastructures, but also changes around what is normal, and what skills people have developed in the future. Second, all social practices in the present are future oriented: we contend that engaging people in discussions around the energy transition can build on desires, hopes and aspirations towards the future. This was the aim of the workshops, to discuss the future. Third, we assume that imagining the future can also be performative in the present or can affect social practices in the present. Exploring whether or not the workshops actually led to changes in practices in the present is beyond the remit of this project, however.

When it comes to energy usage, we are inspired by recent developments around the notion of sufficiency, as a "renewed organization of production and consumption that aims at providing enough goods and services, food and energy, etc. instead of maximizing production and consumption" (Barry, 2012: 161). In energy studies, sufficiency is increasingly argued to be crucial to consider together with the need for more efficient technologies and renewable energy sources (Thomas et al, 2015; IPCC 2022). The energy efficiency gains and the development of renewables relate to energy futures that mostly involve technologies. Energy efficiency improvements relate to measures that allow to consume the same while using less energy, are appliances and processes become more efficient and require less energy for the same usage. Renewables energy, in the same vein, are meant to consume the same while using non-

fossil-fuel based energy sources, thus mitigating climate change. Energy sufficiency aims to reduce demand, and thus links well to a social practice approach. In one definition of sufficiency (Saheb 2021) as well as in consumption studies (Fuchs et al 2021), reducing consumption is linked to the question of human wellbeing, which we now turn to.

In early work linking sustainability to wellbeing, Jackson (2005) suggested that it would be necessary to achieve a wellbeing dividend, whereby reduced consumption is compatible with increased wellbeing. Wellbeing is a vast field of research, which can be divided in two approaches: the *hedonic* approach relies on the pleasure principle and sees wellbeing as preference and desire fulfillment, based on potentially infinite (Jackson, 2005: 22) and insatiable individual wants (Guillen-Royo and Wilhite, 2015). The *eudaimonic* approach considers human wellbeing as "derived from 'flourishing' and lies distinct from a state of happiness or pleasure" (Lamb and Steinberger, 2017: 3). Wellbeing is thus considered as the possibility for "humans to reach their highest potential within the context of their society" (Brand-Correa and Steinberger: 44). Different theories based on this approach propose to consider eudaimonic wellbeing through the understanding of needs and their satisfaction (e.g., Doyal and Gough 1991; Max.Neef 1991; Di Giulio and Defila 2020). Human needs are universal, "objective, plural, non-substitutable and satiable" (Gough, 2017: 3). However, the "means employed to satisfy [them] are culturally, socially and temporally flexible" (Brand-Correa and Steinberger, 2017: 46), and defined through the concept of satisfiers (Max Neef, 1991). If society cannot organize for every individual's own happiness, it can organize for the satisfaction of universal needs through the consideration of satisfiers (Di Giulio and Defila 2020).

Work has been done to empirically operationalize consumption reduction in relation to needs actualization (Guillen-Royo 2010), resulting in discussions around alternative ways of satisfying needs that would be more align with the sustainability objectives. Other works argue for the relevance of linking social practice theory to human needs considerations (Sahakian et al., 2020), stating that practices can be considered as satisfiers of needs. Scholars consider the eudaimonic approach to wellbeing as most relevant for sustainability studies, as it promotes needs-based equity and consumption reduction (Lamb and Steinberger, 2017).

2. Procedures and methodology

The details on how we went from the energy scenarios to the personas living in 2035 are described below as well as in the first publication from the WEFEL project (Sahakian et al 2023). The calculations made on the energy savings potentials for each persona and in general are also summarized. A description of the workshop design and how each workshop was conducted is also presented. The next section (3) aims at presenting workshop results and policy implications.

2.1 From energy scenarios to fictive personas from the future

a. Process of translating abstract scenarios into everyday life assumptions

The process of translating abstract scenarios into everyday life assumptions is summarized here. Starting with the official scenarios towards net zero for Switzerland, the energy perspectives 2050+ (EP2050+), we reviewed a number of scenarios that anticipate varying degrees of changes at the household level. Indeed, the EP2050+ relies almost exclusively on efficiency gains and the deployment of renewables, albeit with demand side management. Households would be incentivized to use energy when renewable production is at its highest, for example through price mechanisms. For our purpose, and in order to evaluate the potential changes in everyday life dynamics, we turned to scenarios that also consider sufficiency measures – defined in the 6th Assessment report of the IPCC as "a set of measures and daily practices that avoid demand for energy, materials, land and water while delivering human well-being for all within planetary boundaries" (IPCC, 2022, 31). We started with the decarbonization scenario from the negaWatt association which is estimated for Switzerland (Moreau, Principi and Ravalet 2021*)* and other EU countries, including assumptions about sufficiency, efficiency and renewable energy. A global Decent Living Energy (DLE, Millward-Hopkins et al. 2020) scenario evaluates the satisfaction of basic needs for all in a decarbonized world. This does not a priori exclude any household practices, such as flying, but scales activities by what is needed to live a decent life, or one where human needs are met for all people (i.e., in providing people with the possibilities required for flourishing, such as the provision of physical health and safety, social and political participation in society, among others). At the European or Swiss scale, this means a reduction in living space, and fewer and less frequent miles traveled by car or plane. We also considered two additional scenarios, the EU's long-term strategy with emphasis on behavioral change, 1.5LIFE, and the SPREAD, focusing on the unsustainable lifestyle impacts to be overcome by 2050. The contributions of both technical measures, energy efficiency and the deployment of renewables, and non-technical ones such as reductions in demand for energy services (including food), have recently been evaluated (Costa et al. 2021).

Once the scenarios were selected, we coupled them with changes in household consumption by domain or classification of individual consumption by purpose (COICOP) available in household budget surveys. We considered working and living dynamics to account for choices between work and leisure time. We then described each theme as it might play out in the future, as a social practice. As such, we described food provisioning, getting around, or staying warm at home in relation to (new) material arrangements, (new) skills and competencies, but also (new) meanings. Rather than choose the date of 2050 for the future we describe, we agreed as a team and with input from our advisory committee (made up of scientific experts and practitioners) to represent the personas in 2035. This date is in a not-too-distant future, which people today could relate to. In essence, we wanted people to feel somewhat familiar with the rules of the game in the future. Rather than the more distant horizon of 2050, a closer date also reinforces the sense of urgency, or that more short-term planning and actions are needed in the energy transition.

b. Future personas representative of everyday life in Geneva in 2035

Based on the Swiss household panel data, we engaged in statistical analysis to arrive at sociodemographic characteristics for people living in the Canton of Geneva. Among all the profiles considered in the Swiss household panel (adult individuals from the Canton of Geneva), eight were randomly selected. Small edits were made to the profiles to account for representativity based on the characteristics of the Geneva Canton population, thus creating major groups of individuals related to age, educational background, and household composition. As statistical data does not account for ethnicity, sexual orientations, or disabilities, these aspects were purposefully brought into the personas. Each persona is situated in the Geneva landscape, with information on the neighborhood and the housing type, in order to ensure that they are relatable to citizens living in Geneva.

A similar effort was undertaken for Basel in 2022. The personas descriptions and related images were edited and situated within the Basel environment, in order to be relatable to people participating to the group discussions in Basel.

c. Back casting and transdisciplinary methods towards desirable narratives

In describing practices from the future, we recognized that, at first, the personas were being represented in moments of life that were limited to their actions, in relation to mobility, food provisioning, among others. It was important to integrate changes to 'systems of provision' (Fine et al 2018), for the delivery of goods and services, but also institutional changes, or changes to infrastructure, that would have occurred in order to make these moments in life feasible. As such, the narratives of the future were further augmented through visioning and back casting processes. Back casting involved recognizing what changes might have been necessary to arrive at the personas and practices we were describing, such as those living in a car-free city, or in a well-insulated home, with a reduced workweek. Both the visions of the future, around personas and moments in their lives, and the back casting elements, were facilitated through participative methods, based on the consultation of citizens and experts (total n=25). The citizens and experts were presented with a first version of the personas, illustrated by Eva Leon, a student at the University of Geneva at the time, that they could comment and discuss. The diversity of actors that were approached to help build the personas was key to imagining diverse futures, but also gaining buy-in from diverse stakeholders beyond academia, and following Urry's argument that "public bodies and NGOs must be incorporated in the process. Indeed, they have to be key contributors within the processes of anticipating and making futures" (2016:12). When it comes to the energy transition, the research team had a bias towards sufficiency measures. Through interactions with advisory committee members, we were incited to balance our narratives with more examples of renewable energy production as well as technological efficiency, which were lacking from earlier versions of the personas. We involved an expert known for his work on carbon capture valorization, for example, to include ideas that were outside of our range and expertise.

d. Development of narratives from the future through personas

The result of the reflection process was the development of five personas living and working in 2035 in Geneva, based on the normative aim of net zero by 2050, which is the Big Future (Michael 2017) or overarching imaginary we were building towards; each persona represents multiple narratives and Little Futures, of relevance to everyday life dynamics. Thematically, each persona covers a particular set of themes, related to work-life consumption domains: work time reduction and working from home, less travel and slow mobility, energy pro-sumption and renewables, collective actions and community services, heating and cooling in the city, leisure and hobbies, and investment practices. Initially, eight personas were developed. After a last review of the 8 personas in their first version, the research team realized that some of the consumption categories were covered by different personas, and agreed on the 5 personas that would cover all the consumption categories and avoid any replication. This was also a decision linked to methodological concerns, as the personas would be used in workshops with participants; a smaller number of narratives would allow to have deeper and longer discussions on each of the personas, and to overcome time constraints. The personas were illustrated and translated into comics style boards, in order to add visual imaginaries to the stories and make them relatable to people. Those visual representations were used in the citizens' workshops. The cartoons are available in French and English and are situated in Geneva. They are also available in German, situated in the Basel environment.

2.2 Energy savings potential for each personas

As a further step, we wanted to account for the consumption reduction entailed by the personas of the future, especially the sufficiency dimension, that is not often studied and accounted for. We therefore calculated potential energy savings for each personas in relation to the practices that they illustrate. This process is detailed below.

Changes in household practices with a measurable impact on energy use typically take place within one or several of the consumption domains described above. At the national level, the EP2050+ ZERO-Basis scenario calls for a reduction of final energy use of 130 PJ over all sectors, including buildings, transportation, industry and households by 2035, compared to 2019. While this represents a 17% reduction overall, changes for individual energy sources are much more significant with a 49% reduction in oil use and 45% in natural gas use by 2035. Yet, energy related decisions which can deliver such reductions are typically long term, often more than the 12 years to 2035. They must also be adopted by a large share of the population. These decisions are subject to multiple constraints, including the household agency on heating or transport, and might be constrained by non-energy related decisions. Research estimating the energy and emission reduction potential of shifting household consumption has focused on several domains such as transportation, food and electrical or electronic devices (Kanyama et al., 2021; Murray, 2013). A recent review shows that transportation, shifting to smaller or electric vehicles and/or public transit/cycling potentially saves large quantities of fossil fuels and corresponding emissions when adopted broadly (Ivanova et al., 2020).

Changes are often modelled as shifts in the final consumption of products/goods and services, where the constraint is related to disposable income or a monetary budget, not necessarily tied to wellbeing. Nevertheless, this provides a useful approach to test how households perceive compromises and trade-offs when it comes to expenditures with high energy or emissions attached. Moreover, household budget surveys are compiled by income categories and even household types, such that we can evaluate the distributional impacts of trade-offs and how rural or suburban households might differ from urban

inhabitants. Shifting expenditures can affect energy use directly (e.g., buying less gasoline) and indirectly (e.g. buying fewer flight tickets). The monetary savings, whether they are re-spent or invested, will also use energy, such that rebound effects can be estimated as well. The results of the SCCER CREST Swiss Household Energy Demand Survey (SHEDS) can be helpful in reallocating the monetary savings from energy savings to consumption domains, mainly housing, restaurants and leisure (Hediger et al., 2018).

Trade-offs are essentially (budget/time) constraints which require compromises at the individual household level or collectively set limits on energy use or emissions. We consider trade-offs which are a priori closely connected to wellbeing. Travelling fewer km by private motorized transportation might be perceived as infringing upon one's personal freedom to get around. In Switzerland, 71 % of person-kilometer on land in 2019 were travelled by car. Even more so when those km have to be driven in a shared vehicle and that not only motor fuel use decreases but also vehicle ownership. By trade-offs, we also mean diverging results between the changes in practices at the individual level (e.g. taking public transit rather than private cars) and aggregate changes at the economy-wide level (e.g. missing reduction targets in energy use or emission as in the case of transportation in Switzerland). The calculation is based on the energy input output (IO) table for Switzerland (Nathani et al., 2019) and essentially built on the following equation:

$$e = s(I-A)^{-1}y+h$$

Where e is the sum of all energy use, s is a vector of energy carrier intensity per activity, I is the identity matrix and A the matrix of transaction coefficients between activities. In other words, the elements of A, a_{ij}, quantify how much inputs from activity i is necessary for one unit of output from activity j. The model is driven by final consumption y and direct energy use by households h. This direct energy use corresponds to the definition of household energy consumption in the energy accounts (FSO 2023), which we apply here since transportation in included. As explained by Moran et al. (2020), one can integrate changes at different levels using this model. First, we can act on the energy intensity of activities, or vector s. This is what most scenarios such as the Swiss Energy Perspectives 2050+ do, by expecting more energy efficiency, electrification, etc. The s vector can become a matrix of energy intensities per activity in columns and energy carriers in rows to represent a shift away from fossil fuels for example. Second, one can change the final consumption of goods and services from selected activities by adjusting the y vector of household final consumption. y is typically disaggregated into 12 consumption domains or categories (COICOP) so that air travel for leisure and work can be distinguished for example. Changes in y can occur under a budget constraint, i.e., savings in one category are re-spent in another. Hypothetically, changes in energy use can be estimated without re-spending, or with re-spending at some other time in the future, equivalent to savings accounts (Zimmermann & Moreau, 2018). Third, direct purchases of energy h, motor fuels or heating oil and natural gas, can change as households drive fewer km, shift to public transit or purchase an electric vehicle, lower their indoor temperature or equip themselves with a heat pump.

Changes in final consumption y can be adjusted based on the Household Budget Surveys of the Federal Statistical Office (FSO 2022). When changes in final consumption do not sufficiently reduce energy use in one consumption category, how acceptable would reductions in another category be to achieve the targets? This is a key question in the evaluation of trade-offs and how workshop participants perceive each personas illustrating changes in different domains.

Several consumption domains were identified as essential to link energy scenarios and pathways to everyday life, including living at home, preparing meals, getting around and leisure time, listed in the first column of Table 1. They relate to the work-life consumption categories we identified in our analysis of scenarios. Each domain includes different measures households could adopt with potentially large impacts on energy use and wellbeing. Table 1 also shows where a change in household consumption can be allocated to consumption categories in columns (COICOP) and eventually to specific economic activities. Here the potential changes assume an uptake across the population but not necessarily the maximum potential in technical terms (Moran et al., 2020). The consumption categories are then linked to economic activities as in the SFOE's energy input output table.

Table 1: Examples of everyday life changes and their consumption domains (COICOP).

Work-life categories	COICOP / consumption	Food and non-alcoholic beverages	Alcoholic beverages, tobacco, etc.	Clothing and footwear	Housing, water, electricity, gas	Furnishings, household equipment	Health	Transport	Communication	Recreation and culture	Education	Restaurants and hotels	Miscellaneous
Housing	Reduce SRE[1] per person				x								
	Lower indoor temperature in winter				x								
Food	Purchase more local/seasonal	x											
	Lower dairy/meat products	x											
Transport	Travel fewer km by car							x					
	Use less fuel by driving a small car							x					
	Shift to carsharing/pooling							x					
	Shift to public transit							x					
	Shift to cycling / walking							x					
Leisure	Purchase fewer electronic devices					x			x				
	Purchase more clothes			x									
	Buy fewer flight tickets for leisure							x					
	More restaurants and hotel nights											x	

[1] Energy reference area (heated in winter, cooled in summer)

Source: WEFEL, 2023

The strongest assumption here is that we rely on a household budget in monetary terms, or what people spend on different consumption categories. The relationship with wellbeing holds up to a point and there are limits to this approach. In the food category for instance, we are unable to capture food production and distribution outside conventional markets, such as vegetable gardens and food baskets, other than through lower expenditures in retail stores. However, household budgets are available according to socio demographics, by income quintile, and also across different spatial scales, i.e., urban and rural households (see Pang et al., 2019).

2.3 Using the personas with citizens: Participatory workshops

Once the personas were designed, illustrated, and the energy saving potential of their daily life accounted for, participatory workshops were imagined to discuss those materials with citizens, in order to include everyday people in the debates around the energy transition. This section proposes a description of the workshops design and the ethical clearance procedure, before exposing a summary of the different workshops that were conducted, and the analytical process to treat the data gathered from the workshops.

a. Participatory workshops design

The workshops aimed to be consultative, towards including people in a debate around future imaginaries and the trade-offs between wellbeing and energy savings. The objectives were to:

- Give people the tools for discussing the pros and cons of energy futures in relation to tradeoffs between energy savings and wellbeing.
- Allow people to distinguish the aim of achieving 'sustainable wellbeing' (energy savings and human need satisfaction) from the means (satisfiers) and changes to energy usage patterns.

The workshop design is detailed in the WEFEL Tool Kit, which describes how to use the personas in participatory workshops. The workshops include different phases that are summarized below. To find more information on the workshop design, please refer to the tool kit on the website (the Toolkit is available in French **here**, and will be available in English **here** by spring of 2024).

- **Phase 1: discussion around personas and the good life.** Participants could read the personas that were proposed on their tables. Participants were asked to answer a set of questions: *Does X have a good life? Why or why not? What needs are being satisfied? And which ones are not?* The participants were asked to gather their thoughts on posters.

- **Phase 2: discussion around trade-offs between energy savings and the good life**. Participants received boards about energy saving potentials (i.e., calculations detailed in the section above) in relation to the personas they had discussed. Participants were asked to read the boards and answer the following question*: Are X's energy savings worthwhile in relation to the good life?*

- **Phase 3: discussion around how to organize society for the good life and less energy usage**. Based on the discussions conducted in phases 1 and 2, the participants were asked to answer the following questions: What changes should come about, at an individual and collective level, to achieve high levels of wellbeing with the most energy savings possible? (i.e., most promising solutions).

After the three phases of discussion, the participants were invited back in a plenary format to discuss feedback and share concluding remarks. Participants were asked to choose one person per group to present the most crucial point that was discussed during the workshop. Participants were then asked to give their general impressions on their workshop experience. They had the opportunity to pin their feedback on a board, answering the following questions: *What did you think about the relationship between energy transition and the good life?; How did you like the use of the fictive personas to imagine a future in the energy transition?; What are your feelings about this experience?* (To gain a more subjective reading of well-being)**.** The team closed the workshop with some concluding words to thank participants for their time and explain how they will receive the results.

b. Ethical clearance

Before gathering data, we gained ethical clearance from the University of Geneva's ethical commission (*CUREG 2.0*), as the research involves human participants and in order to adhere to the Charter of Ethics and Deontology of the University of Geneva. We detailed what kind of data would be gathered, and how it would be stored and shared. Based on recordings taken during our workshops, we generated text-based selective transcripts and notes that were anonymized and stored long-term; the audio files from workshops were stored until selective transcription is complete. Data also included visual material: pictures representing workshops, with informed consent. The data was analyzed by using different tools and techniques. Content analysis of interviews and workshops went through systematic coding, with the help of NVivo software. In the context of data management, the data is password protected and kept on a University of Geneva computer, as well as on a secured share drive (i.e., Switchdrive).

In terms of ethics and security, all data generated and the way the data is analyzed follows ethical principles of qualitative research. All data is anonymized, and as such, we are in line with the Swiss Federal Act on Data Protection as described on the page of the Swiss Federal Official Responsible for Data Protection and Transparency. The subjects of data collection (persons) were informed (what data we collect, what we do with the data, and who receives it; when they will be deleted) and they gave their written informed consent. They were be also informed about their rights on information, data deletion and data correction. Only members of the research team would have access to data during the research.

c. Conducting the workshops

Between May 2022 and March 2023, seven participatory workshops were conducted, reaching 154 people in total. Two workshops were conducted as part of the *Assises Européennes de la transition énergétique* in late May 2022. One was conducted during the OFF program of the Assise, in Carouge - the recruitment was made through flyers and posters in the city, and Linked In and press ad. One was held during the ON program of the Assises a few days later, for which the recruitment was mainly made through the Assises communication. Another workshop was conducted in Basel, in a slightly different format, in September 2022 - the recruitment was made through flyers distributed in various shops around the workshop premises in the city of Basel a month before the event. A workshop was conducted during an event organized as part of another project in October 2022 (DIALOGUES, H2020, coordinated by Professor Marlyne Sahakian), for which the recruitment was inherent to the other project, that gathered people at specific dates. Three more workshops were conducted since the last interim report: one as part of an event organized by the energy utility company in Geneva, in November 2022, one as part of an energy training in March 2023. A last one was conducted as part of the sustainable development forum

organized by the federal office for territorial development in May 2023. The various workshops allowed us to test slightly different designs based on different lengths. The table below presents a summary of the different workshops conducted in the past two years.

Workshop	**Location**	**Date**	**Participants**	**Occasion**
Workshop 1	Geneva, Carouge	28.05.2022	24 participants (citizens)	*Assises Européennes de la transition énergétique - OFF*
Workshop 2	Geneva, Palexpo	31.05.2022	57 participants (energy experts)	*Assises Européennes de la transition énergétique - ON*
Workshop 3	Downtown Basel	03.09.2022	5 participants (citizens)	*UNIGE and UNIBasel*
Workshop 4	Geneva, Meinier	19.10.2022	32 participants (citizens)	*UNIGE, DIALOGUES project (H2020)*
Workshop 5	SIG headquarters	24.11.2022	18 participants (employees)	*Event organized around sustainability and sufficiency for SIG employees (Geneva utility company)*
Workshop 6	Association of Swiss Electricity Companies AES	02.03.2023	5 participants (energy experts)	*Workshop in the framework of an energy efficiency facilitation training 2022-2023*
Workshop 7	Sustainable development Forum	16.05.2023	13 participants (administrations employees)	*Forum organized by the federal office for territorial development*
Total participants reached			***154 participants, including citizens, employees, and people working with energy***	

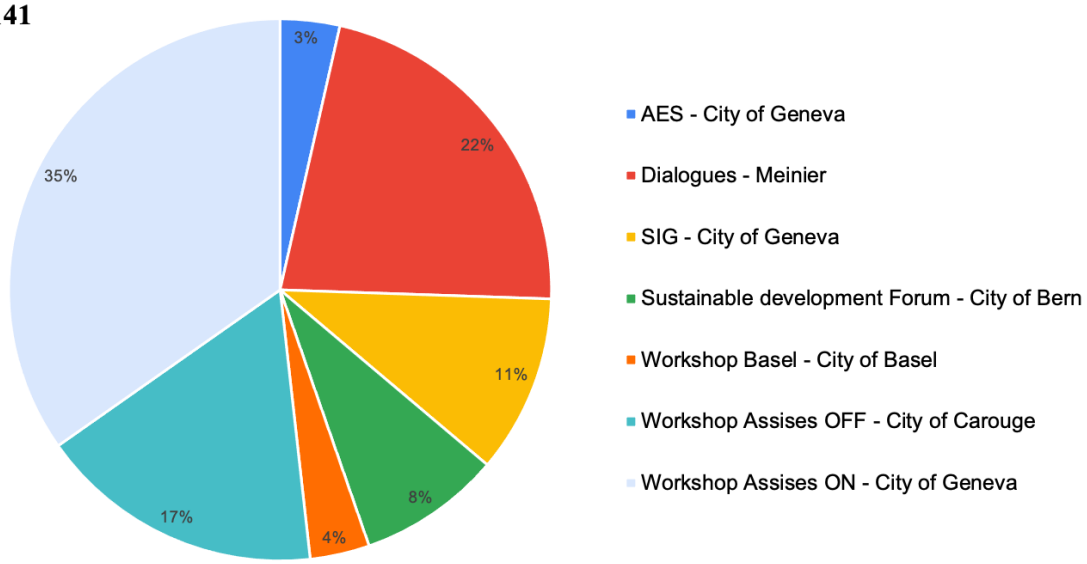
Table 1: list of WEFEL workshops and number/type of participants

The recruitment strategy and operationalization of the different workshops, the detailed process of each workshop and which phases were addressed have been described in the previous report (Interim report 2, November 2022). The main task in this last reporting period was to analyze the workshops conducted as part of the project.

NOTE: While 154 people participated in the workshops, only 78 people agreed to provide full socio-demographic details. Age is available for 108 people, while gender data is available for a total of 141 participants.

Figure 1: Workshops

N = 141



d. Participants

People participating to the workshop had one thing in common: they were interested in giving their time to participating in an event where the good life would be discussed; for some, there was also an interest in environmental issues, although this was secondary to the main workshop aim and question: how to live a good life together in the future.

However, there was a certain degree of diversity in the profiles of those who participated. In terms of age, most people were between 25 and 64 years old, with some participants younger or older than that dominant age range. There were generally more women than men present in the workshops. Most people have high-school and a higher degree education, which corresponds to Swiss averages, but some responds had lower education levels, nonetheless. In relation to work, most people worked full time, but the workshops also gathered participants working part time or unemployed. The income ranges were quite diverse, going from less than 42K per year to more than 270K. Regarding housing, most people lived in apartments, some in houses, and fewer people cooperative buildings or other types of accommodations. Most of the participants were tenants, while others declared to be owners of their accommodations, or cooperative members. When it comes to household composition, the workshops included people in couples with children (35,1%), but also individual household members (23,4%), couples without children (22.1%) single parent families (7,8%), and other types of households.

Figure 2: Age

N = 108

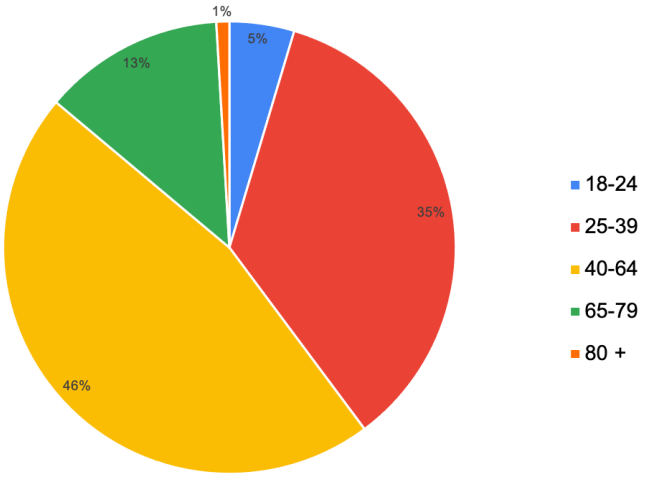


Figure 3: Gender

N = 141

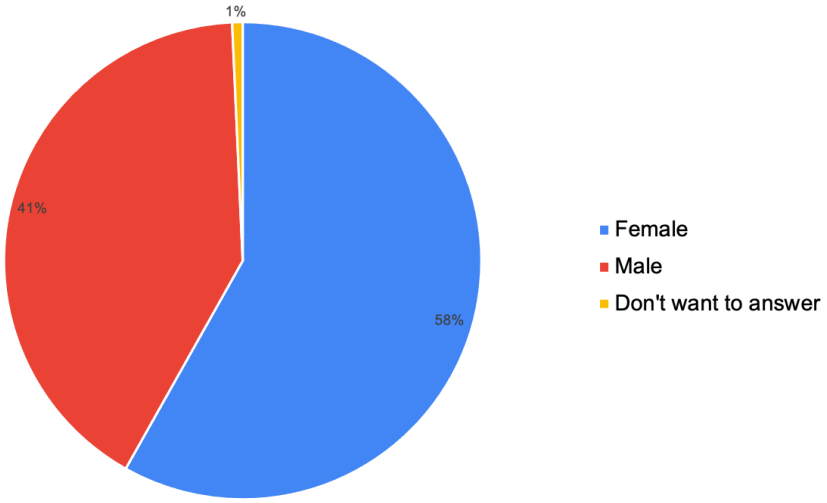


Figure 4: Educational level

N = 83

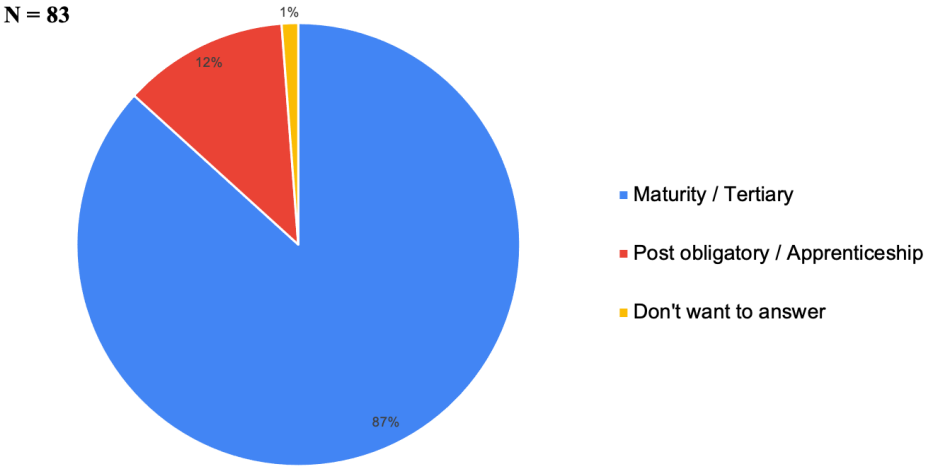


Figure 5: Employment rate

N = 83

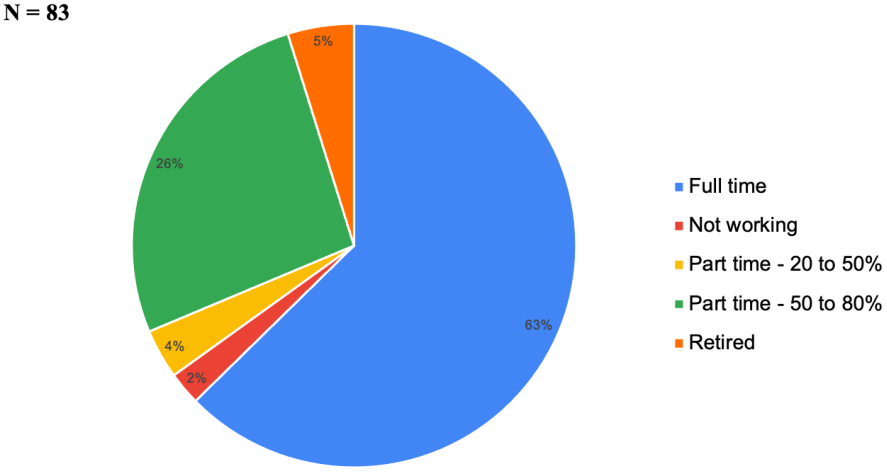


Figure 6: Annual household income bracket

N = 83

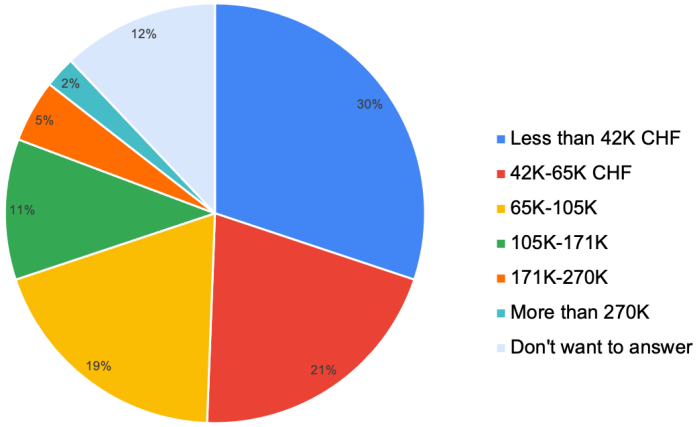


Figure 7: Type of housing

N = 78

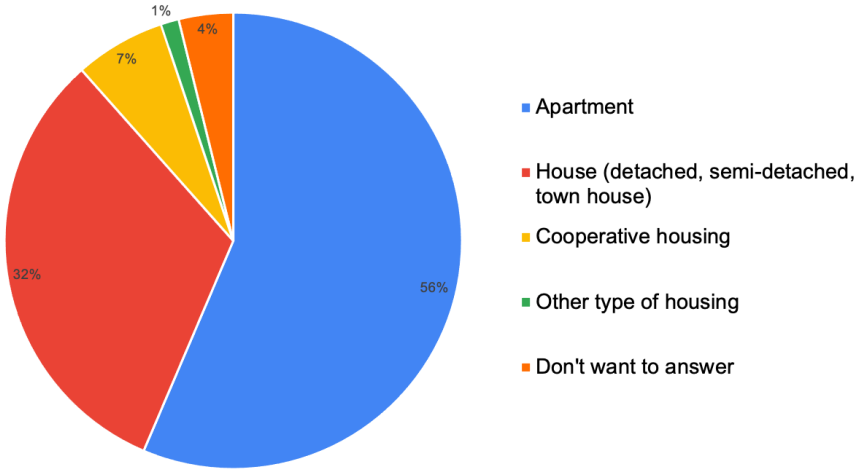


Figure 8: Accomodation status

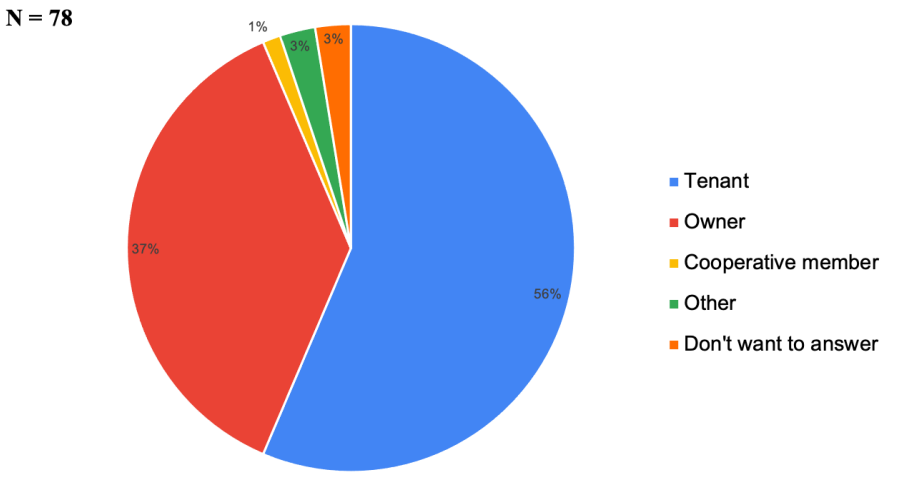
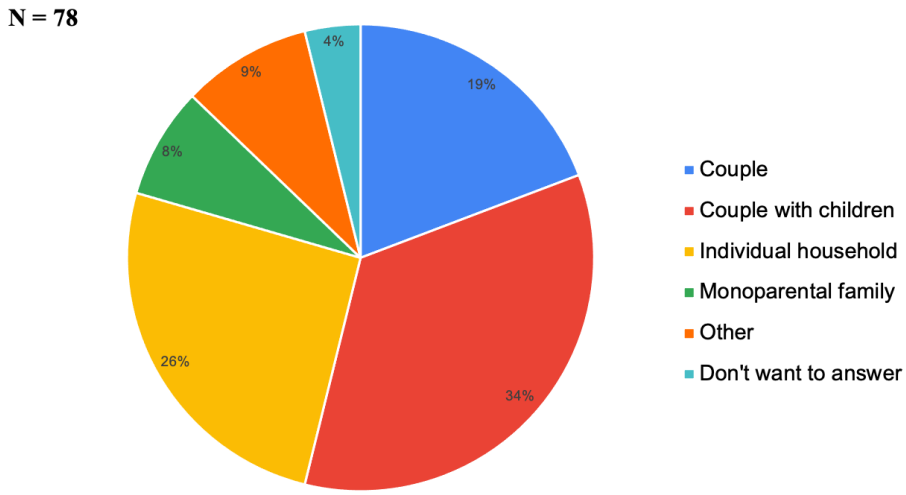


Figure 9: Household type



The following section exposes the analysis process of the very rich data that came out of the discussions with the 154 participants.

e. Methodology for workshop analysis

Data analysis was consistent across all workshops: the workshops recordings were gathered, by workshop and by table, and transcribed. The transcriptions were made by the research team (including the research assistant / intern) as well as by a professional agency. Half of the workshops' discussions were selectively transcribed based on a shared transcription template that related to the project research questions, while the other half was fully transcribed.

Based on the research questions, a codebook was designed to code the data, that was complemented during the analysis. The nodes addressed different elements that we wanted to look for in the data: the broad discussions around the energy transition and the energy mix (efficiency, renewables, sufficiency), the mention of the method of participatory workshop in relation to its structure and how people lived the experience, but also the interactions and dynamics between the participants. The nodes then addressed the personas, how people identify with them, and what people say in relation to the personas format. Broad discussions around the future were considered under a specific node. The mentions around everyday practices were considered, together with the elements that influence practices – considering competences, infrastructures, material thing, norms, social relation and time. Mentions related to reflexivity were considered in relation to disruptions in practices, or how discussing the energy transition and practices for the future made people realize about their own potential of energy consumption reduction in the present. Emotions were accounted for in the analysis, in relation to points of tension, moments of amusement, hesitation, sense of anxiety, sense of fulfillment, etc.

Several nodes allowed for the consideration of the energy savings potentials in the discussions, in relation to the importance the participants gave to them in relation to consumption, the additional value they brought to the discussion, and how people linked energy savings to wellbeing. Wellbeing was directly addressed by nodes: one node helped gather mentions on happiness, while another one focused on needs. In relation to needs, the discussions around protected needs and around fundamental human needs were separated into various nodes. The means of satisfying needs were coded under 'satisfiers' that could be material or immaterial. An important node was focused on changes, divided into collective or individual. Finally, inequalities were accounted for, especially in relation to the energy savings potentials. All the workshops were coded and analyzed through the codebook described above. Big themes came out of the coding phase that were gathered in specific memos during the coding process. Those big themes could then be easily illustrated through the coded elements. A summary of the results based on this analysis is presented below in the section 3 Results and Discussion, below.

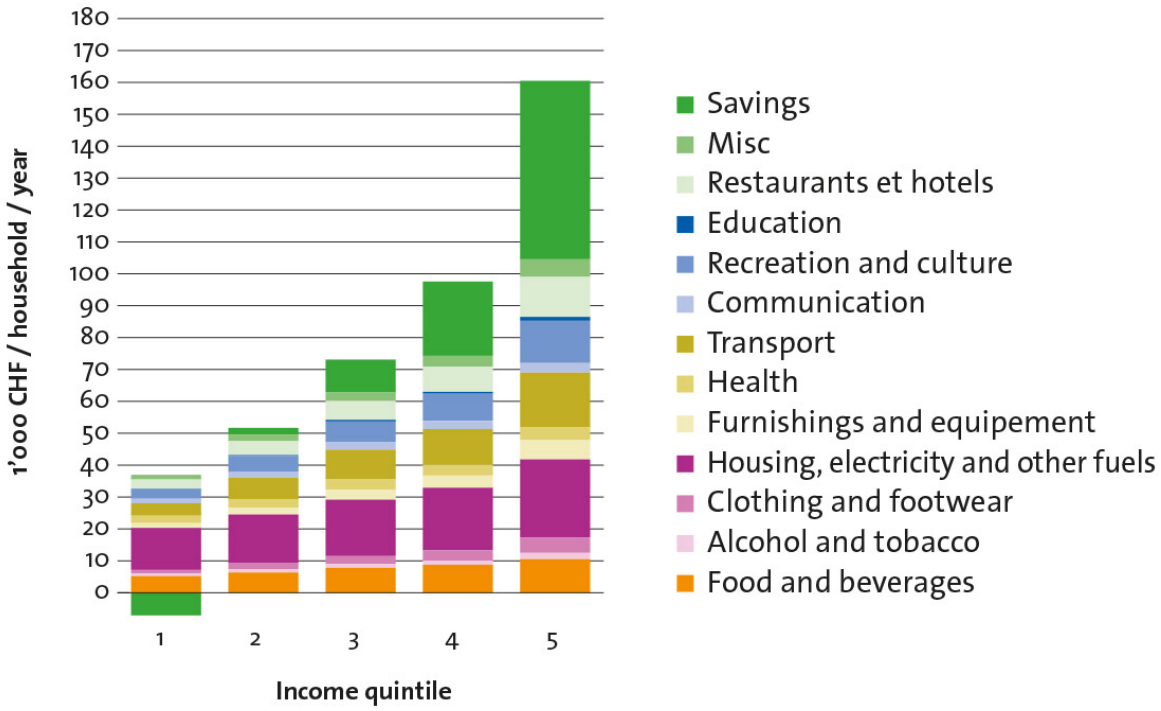
2.4 Aggregated calculations of energy savings for all personas

The potential energy savings at the aggregated level are presented here. They were estimated after the first workshops, based on citizen feedback: having a more comprehensive understanding of all energy savings from the combined lifestyle changes of all personas was requested.

For the workshops, energy savings potentials were calculated for each persona. Participants were presented with the changes in energy use related to the practices representing the specific consumption domains of each persona. The workshops confirmed the relevance of the "energy savings potential" for participants and for a discussion on the future of energy consumption. Indeed, they allowed people to better understand what acts of consumption represent in terms of energy consumption levels and relate this to their own consumption. Also, it brought the discussions towards inequalities in the face of change, and how everyone should not or cannot change their energy usage in the same way.

However, we also realized the limit of the estimated energy savings potential per persona. Participants were critical of calculations that only focused on one domain of consumption and that were strictly limited to energy as opposed to other environmental or resource issues (e.g. biodiversity, water). People were still interested by the energy savings, but also skeptical in relation to the comparatively small contributions from each individual change in practices. Thus, we estimated what would represent the life of *all* these personas together in 2035, considering the combination of all consumption domains: food, heating, mobility, etc. This allowed us to show that the potential of sufficiency measures is not negligible and indeed significant: it represents a reduction of 35% in the direct energy consumption of households in 2035 compared to 2019, based mostly on what we qualify as sufficiency measures (i.e., reductions in demand while meeting human needs). This potential reduction in household energy consumption in 2035 corresponds to approximately 16% of total final energy consumption in 2019, including building, transportation and industry. Household energy consumption includes both housing and transportation as described in section 2.2 and in the energy accounts (FSO 2023). The aggregated results were calculated based on changes in practices for an average household, i.e., middle income quintile. Figure 10 below shows disposable income quintiles of Swiss households per COICOP category. While housing and transport dominate expenditures for almost all income quintiles, savings is the most unequal category and was not directly translated into energy use as it strongly depends on the nature of the savings or investments.

Figure 10: Disposable income per household by income quintile



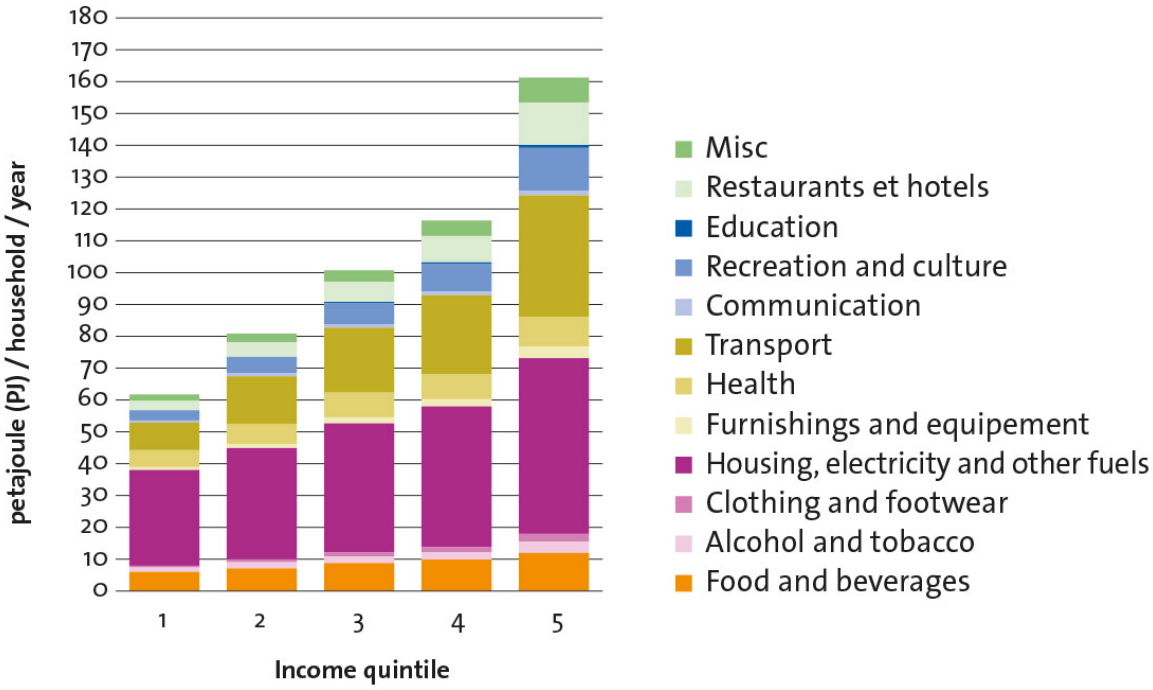
Source: Own calculation based on household budget surveys (FSO 2022) and energy IO table 2014 (Nathani et al. 2019)

As stated above, reallocating these savings to the real economy and direct investment in energy efficiency or renewable energy sources would speed up the transition, and thus avoid significant

cumulative emissions between now and 2050. On the contrary, should the savings be invested in fossil fuel intensive activities then the associated energy use might outweigh direct energy consumption by households themselves. Out of all household consumption categories, savings vary the most between the poorest 20% and the richest 20%.

For all income quintiles, the consumption domains where a change in practice would contribute most to reduce energy use are housing and transport. This is also true for technical improvement such as efficiency gains in heating and transport. Reducing the energy consumption associated with these practices, particularly among affluent households, represents the most important energy savings, while being accessible in the short term.

Figure 11: Final energy use per household quintile



Source: Own calculation based on household budget surveys (FSO 2022) and energy IO table 2014 (Nathani et al. 2019)

Figure 11 shows energy use by household quintile, in relation to the different areas of consumption. This includes domestic energy use, and excludes energy embodied in imports. As the focus is on energy consumption, main consumption categories are mostly related to domestic energy use (e.g. housing and transport). If we consider another example, such as food, the biggest part of the impact is considered in the direct energy use, and the energy embodied in imports is quite negligible.

'Recreation and culture' as well as 'restaurants and hotels' and 'transport', are the areas that show the greatest difference, in energy terms, between high- and low-income households. This also corresponds to the results in monetary terms in figure 10. These are the areas where changes in practices – such as eating out less often, enjoying the lake instead of flying to the sea, adapting heating instead of overheating all rooms – of high-income households would clearly contribute to a greater reduction in

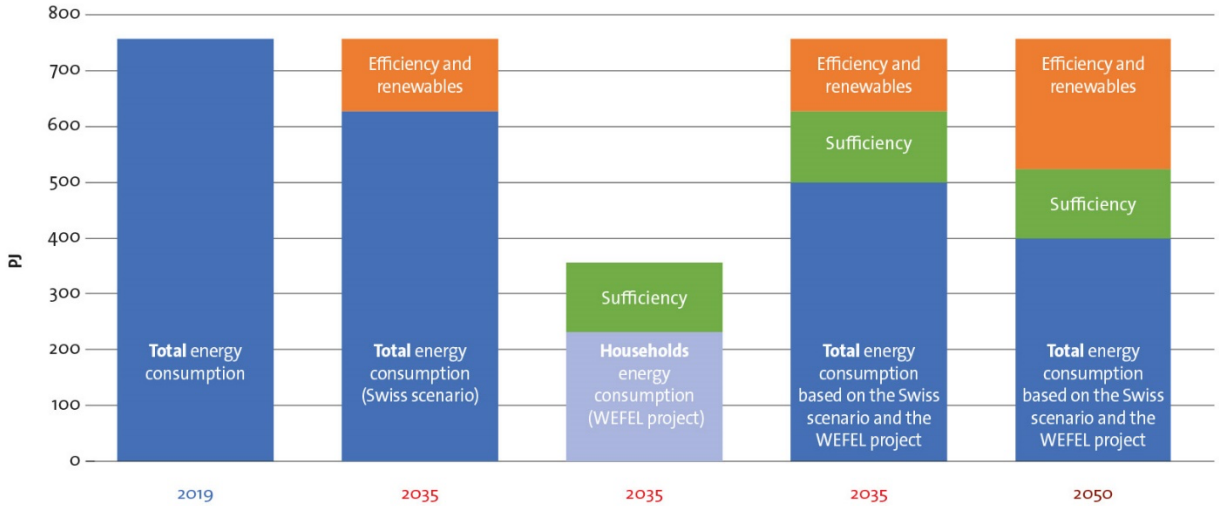
overall energy consumption than similar changes in low-income ones. Conversely, supporting the energy renovation of buildings for tenants would help to reduce inequalities, as the most precarious households spend a higher proportion of their disposable income on heating than wealthier households, as shown in figure 10.

It is important to note that changes in these consumption categories cannot easily be compared to the scenarios of the EP2050+ which split energy use among buildings, transportation and industry differently, i.e. have different sector definitions and boundaries. Some measures to reduce energy consumption are included in both WEFEL estimates and the reference scenarios of the EP2050+. This means that some measures overlap and the potential reductions in energy use do not necessarily add up. For example increase in the use of public transportation is both a sufficiency and an efficiency measure. So is the regulation of indoor temperature which often involves insulation but can also means different temperatures between living and bed rooms. This issue of additionality cannot be estimated easily and in aggregate remains small, within a margin of error.

Figure 12 combines the total final energy use in 2019, the energy use in the ZERO Basis scenario for 2035 and the related potential reductions as described by the EP2050+ (Prognos AG et al., 2020), and the energy use and potential energy reduction we estimated for 2035 illustrated by the personas (Energy use estimated in WEFEL).

The first column represents the final energy use calculated for 2019 in the EP2050+. The second column represents the potential reduction represented by the WEFEL measures, and illustrated by all five personas combined over household energy consumption. The third column represents the savings illustrated by the EP2050+ in 2035. The fourth column shows what the sufficiency measures illustrated in the WEFEL personas, combined with the technical improvements in energy efficiency and the deployment of renewable energy sources can achieve in 2035. The last column illustrates the same combination for 2050. Adding sufficiency measures in 2050 would reduce energy demand and could potentially reduce the need for negative emissions technology and contribute to reducing the cost of the energy system. The results shown for 2050 include the same absolute contribution from sufficiency measures as in 2035, the target year for the WEFEL project. However, further technical improvements in the energy system in 2050 means the potential for sufficiency might be overestimated then.

Figure 12: Potential energy savings from WEFEL measures compared to energy savings based on the ZERO Basis scenario of the EP2050+

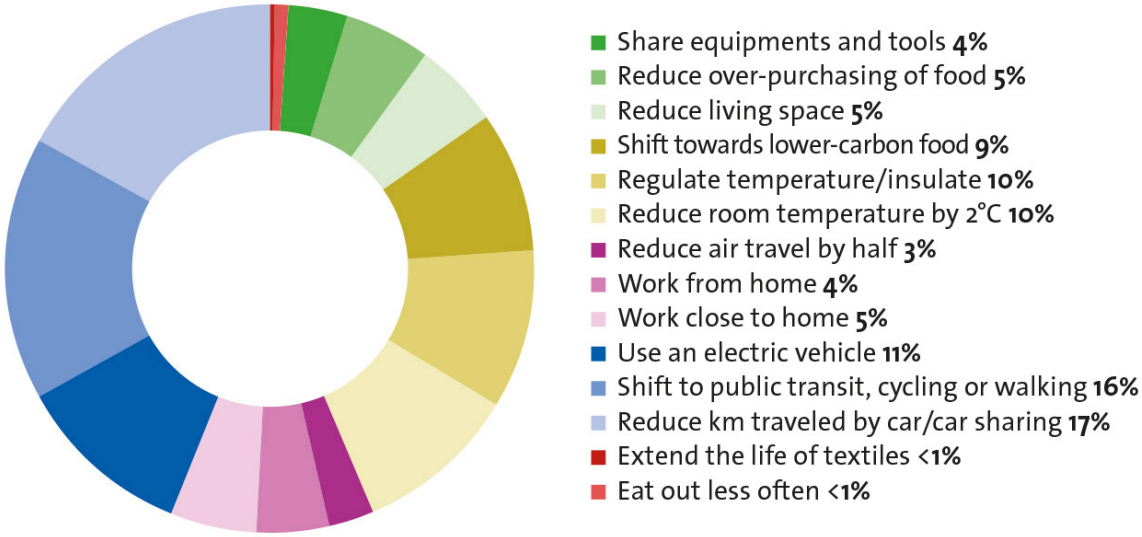


Source: Swiss EP2050+ and own calculations

To show how the reductions in 2035 can be achieved by changes in household practices, the relative contributions of all the changes in practices illustrated by the personas were compiled in the pie chart below. Note that these contributions in 2050 are the same as in 2035. Indeed, the personas represent changes that happen by 2035, on the way towards 2050, and no change was imagined between 2035 and 2050.

Figure 13 represents the distribution of potential final energy savings by changes in practices (WEFEL measures) between 2019 and 2035. As indicated, the main potential lies in housing and transport, in particular the regulation of temperature and the reduction of km travelled.

Figure 13: Potential relative changes in energy use by consumption domain and by 2035



Source: WEFEL, 2023

The potential energy savings from all the changes in housing and transport practices are almost equivalent to the technical changes in each of these sectors in 2035. In other words, consuming less (for transport, heating, etc.) is equivalent to the reductions in final energy use from technical changes over the same period of time. This is achievable in the short to medium term and at a relatively low effort, especially as low-income households are already consuming less. High income households, however, would see their share of energy use reduced the most which may translate into greater trade-offs between energy savings and wellbeing. Indeed, those reduction would have a biggest impact on their consumption that other households, and this might lead to increased consumption in other domains (rebound effect).

3. Results and discussion

This section presents a summary of the data analysis for the WEFEL project, based on the workshops. A preliminary data analysis was presented at the WEFEL Advisory Committee meeting in December 2022. Below, we share some further reflections that have come out of our analysis of the data from the different workshops, in relation to the main research question that we pose in WP3: ***How do Swiss citizens imagine a transition to these energy futures in relation to their everyday lives and wellbeing?***

The findings are presented in relation to tensions around planning for the energy transition towards sustainable wellbeing in the future, in three sections:

3.1 An interesting methodology to discuss the energy transition

a. Stories for imagining the future: fictional characters from 2035

Narratives were relevant as a method to invite citizens to discuss the energy transition and their views on the future. People could relate to the fictive personas and their everyday activities, and engage in discussions around what it means to live a good life in Geneva (and Basel) in the future. Points of tension appeared in the discussions around the personas: people could identify with the personas and their practices, but also found that they could be considered as not representative enough of the future.

- The personas presented **resonated deeply with the participants**, who found it easy to connect them with their own daily lives. Participants readily **associated the personas with their own daily routines** and the corresponding aspects of those routines. As an example, one participant noted, *"It makes me think of something, and Carouge I think is doing it rather well, to vegetate as much as possible so that people are less inclined to use air-conditioning at home and more inclined to go out in a park, on a bench, in the shade*" (*Discussions around Isabelle and Philippe personas).* The personas brought participants to discuss their own experience and projects, in relation to the transition: *"Now to take some concrete examples, what's interesting is that we have a small project, a citizens' collective, and we have access to a plot of land that belongs to a private company, so it's interesting to see that there are private companies that make land they don't use available to citizens..." (Discussion around Quentin and Jasmine personas).*

- The incorporation of energy savings potential calculations proved to be a transformative element, leading participants **to grasp the energy intensity of their daily routines**. This realization stimulated introspection regarding personal consumption habits. A participant aptly summarized the impact of these calculations, stating: *"It's true that it makes you realize things when you see that, well there are things where I say to myself, I'm going to make more of an effort in that area. (Discussion around Audrey and Hussein personas)*

- The personas' **stories were seen as plausible future scenarios**. A participant expressed this sentiment by saying: *"What I noticed is that most of the practices already exist today, (...) I think it's an extension of what exists, I personally expected to see something extraordinary and what I find interesting is to see that most of the practices are already there,(...) which is positive but which also shows that we are not going to have something that will appear in a magical way!"* (*Discussions around Isabelle and Philippe personas).* The personas reflect society and the transition and are seen as the participants as probable.

The participatory workshops delivered a validation of the creative format employed, featuring personas as engaging and effective tools for comprehending and discussing the complexities of the energy transition. The personas successfully bridged the gap between abstract concepts and practical discussions, helping individuals better grasp the nuances around the energy transition and more sustainable futures. This validation underscores the potential of innovative approaches to drive meaningful conversations and actions in pursuit of a more sustainable future.

- The workshop experience revealed that images of the future served as catalysts for encouraging participants to **reflect upon consumption in relation to their own situation and in relation to change. They discussed sufficiency without it being mentioned:** *"S: The impression that they have entered a situation of desirable sufficiency. I mean, they're looking for it…, F: And one that's*

a bit constrained all the same, S: But one that's constrained. In other words, are they happy with their sufficiency?..., C: Yeah, after they've got an income, you're right...hmm..., F: Well, they're positive, S: They have small incomes. Between the bottom and the middle of the scale, JA: I get the impression that they see the glass as half full rather than half empty, but in any case, hmm...., S: Yes, that's it…, JA: ...in the way they describe it, it's..., S: ...they have a positive attitude (Discussion around Jasmine and Quentin personas). Personas also made participants reflect on their **own present society and how it might change in the future**: *"As shown with the repairing clothes example, we will have to start learning ways of living that are less resource intensive and be more mindful about our resource consumption" (Discussion around Audrey and Hussein personas).* Participants do reflect **upon and reinterpret the orientation of future practices**.

The personas and their depiction of future scenarios played a crucial role in fostering reflexivity among participants. They encouraged individuals to contemplate new meanings and perspectives concerning the orientation of future practices, for them and for others. In essence, these personas served as thought-provoking catalysts for reevaluating personal and collective approaches to practices in the future, prompting participants to consider alternative paths towards a more environmentally conscious future. This argument was well illustrated through feedback notes left by the participants at the end of the workshop: *"Reflection on my own consumption and what can be put in place quickly*", *"After today and the discovery of Jasmine, I'm going to eat even less meat", "Energy transition and the good life? It's important for me to find the right balance: how far can I go to live well anyway; possible response: increase the collective aspect in my daily life, to reinforce this conviction to make change happen; invest more in collective action at local level". (Feedback notes, Geneva Carouge).* Understanding the personas and relating them to their own realities made the participants reflect on what they could change in their everyday life*: "We don't have to wait to live like Jasmine and Quentin, we can already buy less, or cook the leftovers and therefore we waste less food, just on our own scale*" (*Discussion around Jasmine and Quentin personas)*. Here, the participant reflects on the personas' everyday practices and highlights that even if it might be difficult to follow the exact same lifestyle, for various reasons, such a story from the future showed that they can shift their practices towards more sustainable habits today.

The use of narratives in the participatory workshops fostered reflections on change, encompassing not only the examination of personal consumption practices in the present but also the recognition of the imperative for collective, future-oriented transformations.

Limits: identification VS limits of representativity of the future

The workshops showed some limits of the personas format we proposed. First, the design of the personas as focusing on one consumption domain was mentioned by the participants as a limit, thus only reflecting a part of their life and daily practices: *"(...) it's all based on food, I mean, it's a vital need, we agree, but here it's really very focused on..."; "(...) but if they concentrate on that and don't open up to other things, well for example leisure activities, shows, things like that, there's nothing...", "There's nothing there, but I think there are others in other characters...*" (*Two separate discussions about Jasmine and Quentin personas*). The personas financial status was sometimes critiqued in relation to the transition: *"I'd like to see other characters created - with more precarious situations, less economic means - how will they live in the future? Are they just going to suffer from the impact or could they also be part of the transition" (Feedback notes, Geneva Carouge).*

As the workshops didn't allow the participants to discuss all the personas (due to time constraint, and as following the design the team decided upon), some participants were frustrated that the personas only focus on one specific aspect of consumption. Someone suggested to link the personas *"It would be also interesting to start drawing parallels between the different personas and different consumption domains" (Feedback note, Basel).* For some participants, the personas didn't really reflect nuanced future: "*JA: Do we only have happy stories from 2035? Or are there others that accentuate the frustration more...because I don't think the frustration is very accentuated here. There are a few allusions... here and there, but it's not... it doesn't seem to be...C: Me...I think that...well, the 5 families are the same way. They're half happy, half not happy....To question.." (Discussion around Jasmine and Quentin personas)".* Some participants also mentioned that they would need more context to understand the relationship with needs: *"JA: I find that they don't talk about...the government system. So it's difficult to put an opinion on...." (Discussion around Jasmine and Quentin personas).* These limitations suggest that more time could be given to the workshops in the future, to go through several personas and to spend more time on needs satisfaction.

b. Debating the energy transition collectively: participatory workshops

Creating a space for people to engage in participatory discussion around the energy transition was relevant and useful, as it allowed people to challenge the status quo and imagine possible changes, to exchange with people with different backgrounds but similar will to address and be part of the energy transition debate. Tensions appeared in relation to the deliberation through discussions, and between the various participatory occurrences. Overall, the workshop setting allowed people to challenge each other's points of view, and to come to interesting conclusions that were collectively discussed.

- Participants found a **sense of community**, **shared values, and active participation** in the workshops, satisfying their **need for belonging and engagement**. This was illustrated in the feedback notes gathered at the end of the workshops: *"It makes me optimistic to see that there are initiatives like this, that include civil society in the debate" (Basel); "Realizing that there are many of us who want to move in the same direction optimism » (Carouge); "Feeling of contributing to the energy transition" (Carouge); "Co-constructing tomorrow's world; very stimulating to think together; acceptance of other people's ideas; listening, benevolence and open-mindedness" (Carouge).*

- In relation to the **workshops' interactions and dynamics**, the deliberations moments were not always easy. For most of the groups, one person took the moderator role, but this didn't avoid the fact that some people didn't leave room for others to talk and give their points of view *(Notes from transcriptions).* The views were mainly convergent in all, and participants used to correct each other with nuanced words and ideas, such as not compromise but more a balance *(Notes from transcription, Basel).* However, some examples of disagreements can be highlighted, exposing an additional tension in discussing the energy transition that has been uncovered by the workshops: there was a slight disagreement around the digitalization of everyday life, some arguing that this doesn't result in wellbeing as the human contact is missing and some arguing that it is more sustainable *(Note from transcription, Basel, discussion around Audrey and Hussein personas)*. There was a disagreement between one of the participants of a table against the others about the happiness and wellbeing of the family. This one participant believed that from a purely argumentative point of view, the family was doing well but they were not fulfilled, which the others didn't agree to. (*Note from transcription, Basel, discussion around Jasmine and Quentin personas*). This is an example of disagreement that was identified in the workshops, but it wasn't the only one

as people didn't always converge in relation to the personas and the personas in relation to wellbeing. The personas did create debates and contentious discussions, even if some people found them too appealing and not extreme enough. More debates and tensions could have arisen had the personas presented very extreme modes of living, which was not our intention.

- The group discussions and possible tensions facilitated **moments of self-reflection**, enabling participants to **challenge their own assumptions** about the energy transition, because they could discuss and share arguments with other people, and also because they didn't always agree with one another. The workshops encouraged participants to **confront and question their assumptions regarding the future**, both in their own lives and within the context of the transition. For example, some participants started a discussion around quotas and taxes: there was a disagreement and a discussion on the idea of setting taxes without quotas, some arguing that such measures would lead to reduced energy usage and emissions, while others felt that it would only lead to greater inequalities, with some more able to pay for their pollution than others.

- Workshops **empowered participants to discuss and deliberate around change initiatives** that aligned with real-life constraints and everyday dynamics, ensuring practical and effective transitions. The progressive aspect of the workshop was noted by various participants: *"Interactive exchange. The workshops are very interesting. They enable a structured and progressive exchange (Feedback note, Geneva Carouge).*

The workshops provided a space for reflection, community, and engagement, encouraging participants to challenge assumptions and imagine sustainable change in their lives and society.

- The analysis of the different workshops allowed us to draw some inputs in terms of the **differences between the participatory occurrences and what to learn from the different formats**. In relation to the groups size, some of the workshops welcomed more participants at each table, which had an impact on the discussion dynamics and making it hard to make sense of the transcription as everyone talking at the same time - methodologically, more than 6 people is too much *(Note from transcription, Geneva Carouge)*: *"I really liked that it was a small group, motivated me to speak more as the environment wasn't intimidating" (Feedback note, Basel).* Some groups were more diverse than others, which brought up different dynamics in the groups – some workshops included only citizens, while others also included experts: citizens discussed more examples of collective changes, gave more examples of their own experiences and practices, and were listening to others more than in the workshops where experts were present. In those, people were talking at the same time and cutting each other off (this might be a bias due to the number of people that were more important in the experts' workshops). Different approaches were taken by the different groups, different tables addressed the questions differently. In relation to wellbeing: some approached wellbeing more objectively, in relation to the needs while others were still very much focused on the idea of happiness; In relation to needs: some focused on Max-Neef's list of needs, other focused on Di Giulio and Defila's list of needs, some went through every need and to only discuss if it was satisfied or not, while others spent more time on each need with no time to address them all. The different participatory settings also had an impact on the workshops: when the workshops happened in small rooms and a lot of noise, it was not easy for people to discuss in the groups, and not easy to analyze the results and the dynamics. Also, the location and space where the workshop was conducted sometimes created discussions and debate in relation to the personas and the transition (around the seed exchange bar present in the location where the Basel workshop took place).

Limits in the operationalization of deliberation

The workshops were seen as too short: *"Half a day more would not be a luxury; subjects that can become philosophical questions, can be a 'referee' to stop debates or reframe them"; "The time passed too quickly, which takes away a notion of pleasure in the activity" (Feedback notes, Geneva Carouge).* The phase two and three were seen as harder than the first one: *"The first exercise is simple (referring to phase 1 of the discussions), the other two much less so (referring to phases 2 and 3)"* (*Feedback notes, Geneva Carouge*); *"Phase 2 is less clear in the instructions... And the sheet with the figures was difficult to understand and interpret" (Feedback notes, Geneva Palexpo).* Some of the workshops welcomed too many participants at each table, which had an impact on the discussion dynamics and making it hard to make sense of the transcription as everyone talking at the same time - methodologically, more that 6 people is too much *(Note from a transcription, Geneva Palexpo).* This is validated by people who had the chance to discussed with a small group: *"I really liked that it was a small group, motivated me to speak more as the environment wasn't intimidating" (Feedback note, Basel).*

c. Taking needs into account as an entry point for discussions on alternative futures

Using needs as an entry point for the discussions on the transition proved interesting and brought people to challenge their own assumptions around what it means to live a good life and to live well in the future. Two points of tensions appeared in relation to accounting for the good life in the future: in relation to the operationalization of the concept of needs, and in relation to the divide between an objective and subjective approach to wellbeing.

- Participants **distinguished between needs and desires** while naturally discussing both, reflecting the intertwined nature of these aspects in daily life. In that sense, the workshops highlighted the fact that desires might be related to needs and considered as **needs satisfiers**, such as in the case of teenagers using new clothes to express their identities: "AD: But actually, if we're talking about the...need, it's not a need to change clothes…, *ED: Well, then it's a need for identity. I know that when my son changed schools, the first thing he said to me when he started secondary school was: « I have to see the class photos and look at what the others are wearing, look at the shoes" (Discussion around Audrey and Hussein personas).*

- People are able to discuss **wellbeing in relation to the personas**, considering the needs proposed, and to account for what is really important for themselves and for society. Most discussions are about **personas needs being satisfied**, despite the measures and changes described in the stories: E.g. ***Subsistence****: Personas mindful about their food choices and nutrition and try to follow a balanced diet (about Jasmine and Quentin personas eating less meat and balancing diet);* ***Being part of a community****: satisfied, as "the multigenerational complex they live in forms a kind of society" (Discussion around Jasmine and Quentin personas);* ***Freedom****: "for me the opposite of freedom is when you have no time" (Discussion around Jasmine and Quentin personas who work part time);* ***Identity****: "she lives in a cooperative, in a flat share, this is also part of her identity."(Discussion around Emma persona).* Beyond the need being satisfied for the personas, participants emphasize the fact that the most important thing is that they have the opportunity to satisfy the specific need, they are given the possibility: *"P: Well, broadly their need for leisure*

is...more or less...G: Satisfied P: ...satisfied, aren't they? V: Yeah P: At least they have the opportunity to do so." (Discussion around Isabelle and Philippe personas).

- Participants emphasize on the importance of taking needs into account when **addressing practices and efforts**. The conversations on **energy savings** prompted reflection on necessary changes, acknowledging shifts from past habits and identifying future alterations. People emphasized the fact that the changes presented in the personas would not cost much in terms of quality of life and that their energy-saving benefits were worth it when compared to how it could impact the good life. Eg. "*Giving up meat was a low-cost option, because it fitted in well with his ideas, etc. The advantage is quite enormous in terms of investment, it's simple, but the impact is quite big" (Discussion around Jasmine and Quentin personas)*, but some shifts in practices are compared to others: *"In terms of concessions, it's less complicated to say to yourself, I'm going to eat vegetarian 5 days a week. And 2 days I allow myself to eat meat, what can I say, I have 20 km to go to work. I have to give up my car." (Discussion around Jasmine and Quentin personas)*

Limits in operationalizing the good life

Limits were highlighted by the participants in relation to needs – limits that can be categorized as methodological but also conceptual. In relation to the methodology of operationalizing needs: the **concept of needs** was not easy to understand and it was not always clear for the participants how to treat the needs: *"B: I'd have put leisure. They seem happy...so wait....is it our perception or is it...based on...P: Well, it's our assessment of needs...B: What needs seem to be met...the...after their...their way of life, in other words. V: In fact, that's all we have to go on...". (Discussion around Jasmine and Quentin personas).* The needs scale wasn't easy to apprehend for people: do the needs relate to society, to groups, to individuals, etc. The role of fundamental needs wasn't always clear for people: *"The role of the basic needs discussed in the first two stages should be better explained" (Feedback note, Geneva Palexpo).* Participants did not address all the needs, and they do not address all the needs the same way as some needs are discussed in detail while others are hovered over, which makes the analysis difficult with regards to the relation between personas and needs satisfaction. The fact of proposing two lists of needs was confusing for the participants and had an impact on the discussions: they first discussed Max-Neef's needs for the first personas and then only used Di Giulio and Defila's needs for the second personas. This suggests that time should be spent agreeing on a list of needs, before beginning the discussions. On a more conceptual hand, a tension came out in relation to objectivity and subjectivity. Participants approached needs as subjective more than objective: *"C: To concretize their own idea of everyday life, so their ability to concretize their own idea of everyday life, S: it's quite subjective, we don't know what their idea is, for me we don't know what their idea of everyday life is" (Discussion around Jasmine and Quentin personas)*. In relation to distinguishing wellbeing from happiness, the **significance of the hedonic dimension of wellbeing was emphasized**, or the importance of recognizing the inescapable role of subjectivity. Two levels of understanding of wellbeing appeared, that seem both necessary when discussing the transition: 1) emotions and subjective considerations when focused on the personas; 2) broader reflections around more objective needs. However, we agree with Di Giulio and Defila that - when it comes to organizing society for human wellbeing - a needs-based approach is more relevant, as needs can be planned for and protected, in ways that emotions such as happiness cannot.

d. Conclusion on the method: an original method challenging assumptions

Collaboratively engaging with fictive narratives in relation to notions of the good life provides an opportunity to **challenge teleoaffectivities** (considered as goals, aims and aspirations towards the future) **collectively**, which might not have been possible if the workshops were about the narratives from the future alone. *E.g. "Lovely workshop, thank you! There's a strong link between energy transition and well-being - there can be no change without support, which can come through something that's close to the individual's heart (i.e., well-being); the storytelling is very relevant --> showing, illustrating, makes it easier to project yourself." (Feedback note, Geneva Palexpo).* Bringing together stories from the future and an understanding of wellbeing through fundamental human needs helped participants to go further from the concept of desires and discussed new aspirations for themselves and for society, in relation to what is really important to them. People could reflect on the orientation of future practices for themselves: *"Reflection on my own consumption and what can be put in place quickly", "After today and the discovery of Jasmine, I'm going to eat even less meat", "Energy transition and the good life? It's important for me to find the right balance: how far can I go to live well anyway; possible response: increase the collective aspect in my daily life, to reinforce this conviction to make change happen; invest more in collective action at local level". (Feedback notes, Geneva Carouge).*

Participants engage in discussions that encourage the **questioning of preconceived notions about well-being** and prompt reconsideration of what truly holds significance for individuals and society. These dialogues serve as a platform for reflecting on the distinction between desires and needs, as well as the importance of considering both individual and collective well-being in shaping future aspirations.

The personas proved instrumental in stimulating reflections on the **future landscape**. Participants engaged in dynamic conversations about the potential variations in how things could, should, or shouldn't look and be in 2035. These discussions encompassed a broad spectrum of considerations, including the role of individual consumption choices versus the necessity for overarching structural changes in achieving sustainability objectives.

3.2 Empirical results: promising results and tensions towards imagining the energy transition

The results show promising ways forward as well as important tensions to be taken into account in planning for the future, in relation to the impact of change on well-being, alternative ways of satisfying needs, individual and collective change, and inequalities in the face of change.

a. Tensions between past and future habits

Participant discussions emphasized the **tension between past and future habits**, in relation to changes and constraints. As an example, a group strongly discussed **changes and evolutions** that have been accepted in the past in relation to constraints: "*B: We managed to do it. And then when we closed the banks of the Seine in Paris and everyone went berserk....hmm...well everyone insulted the Mayor of Paris and then today well it's...it's...the banks of the Seine are pedestrianized and then... there are plenty of people who have got used to it and then it's... yeah, there are plenty of people who are still bothered by it but in any case it's finally been accepted and I'd be surprised if the next Mayor of Paris ...decides to reopen the banks of the Seine to car traffic. Well, I don't think there will be as many." (Discussion around Isabelle and Philippe personas).*

The workshops also brought up discussions on the tension between the idea of **chosen or forced lifestyle**: *J "broadly, we can see that materially, well, they have everything they need if they like these activities, the choice of activities at the individual personal level, well, we don't know whether they chose it or were forced into it, and at the collective and community level, well, on the whole, there are...the needs at the community level seem to be met, J: we don't necessarily know whether they like the choices that have been made by several people" (Discussion around Jasmine and Quentin personas).*

In relation to the tension between the forced or chosen lifestyle, participants discussed the **agency of the personas in the transition**: *"S: Exactly! and then power of decision too, maybe, maybe they want to get involved in life... in the choices, do they participate in the choices... to develop as people, J: can they participate? for me, determination means being able to make choices, about the way we live, isn't that it? what's not clear to me is can't they, for example, ask for changes in the community?" (Discussion around Jasmine and Quentin personas).*

The personas daily life linked to the energy savings brought people to discuss the **balance between efforts and quality of life** in relation to change in practices. As an example, a group discussed Isabelle and Philippe personas' choice to move to smaller housing arrangement, no negative impact on wellbeing: "*G: On the other hand, they did make the choice ... to go for this type of housing. So they gave up the single-family home, N: Yes. And that..., G: Because in theory, when you read it, it's a real choice. That they chose to go into a building ... that was going for sufficiency, hmm...., I: Yes, they did make choices, G: They made a choice. They made a choice…Without giving up their comfort..., A: Well, in fact they took the choice they had, I: But that's because I think that this...choice typically doesn't...really have an impact on their well-being..., P: On their quality of life, I: ...and when you look at their other activities...I don't think the fact that they've moved from a house to a flat has had a negative impact on their…".* (*Discussion around Isabelle and Philippe personas).* Participants also discussed the **rebound effect** in relation to practices change: *"I: Yeah well then you see if she gives up her pilates class and then instead she buys a car and then she drives to her ...her pilates class [laughs] in... Because in the end there's..., B: Yes, but...But it's just that she has a pilates class here. You see...at the bottom of her..." (Discussion around Isabelle and Philippe personas).*

b. Distinguishing between needs and satisfiers, and discussions around synergic satisfiers

Participants **distinguished between needs and satisfiers** across various consumption domains, recognizing that satisfiers can serve multiple needs, and they could **explore and discuss alternative satisfiers** for change, e.g. *Gardening as answering several needs**: needs to perform activities that are valuable, leisure, subsistence;** Free spaces for youth, without the need for consumption, with responsible consumption without obligation : **needs for affection, community ;** "It's easier to get a cheaper flat if you have shared things, because it impacts less on family needs": **needs for subsistence, protection, community; "**There are now houses that are changeable, for example, if the parents separate, it can become a flat or a studio, side a bit modular": **needs for subsistence, protection** (Quotes and notes from the various workshops around satisfiers of needs).* The possible positive rebound effect of changes was discussed, wherein changes towards alternative satisfiers in one domain encourage changes in others, fostering sustainable practices. Participants discussed alternative satisfiers in relation to a collective vision of change, for example discussing the fact that people would be willing to accept a constraint and change if there are alternatives that still answer their needs, an offer at the collective level that allows an alternative. In relation to that, alternatives have been discussed as necessarily accessible and affordable for everyone, relating to the notion of equity. Participants discussed alternatives in relation to a notion of exchange, exchange something for something else. Such discussions brough the existing and relevant examples of plastic bags in supermarkets and individual versus collective transportation: *"G: I'm quite sure that people are capable of making the effort as long as the service is there" (Discussion around Isabelle and Philippe personas).*

c. Promising and synergic practices for the future

Participants came to discuss the energy savings of the practices related to sufficiency (alternative satisfiers proposed in the stories) of each persona, thus going further in the consideration of what change means for the future. If some energy savings seemed really high for people (*about Jasmine and Quentin personas in relation to food consumption*), for most of the personas, participants found that the energy saving per personas were not as high as they expected. However, almost all participants agreed that the energy savings were still worth it in the long term. When linking the energy savings potentials to notions of the good life, participants mainly discussed the energy savings as being worthwhile in relation to wellbeing, in terms of tradeoff.

> *" P: Do we think that reducing heating by two degrees has a major impact on the energy transition and doesn't meet the need for well-being?; SA: It doesn't penalize the lifestyle...; P: It doesn't penalize well-being"; MA: It doesn't penalize anything at all; SO: yeah, but in terms of overall energy consumption, it's only a 3.5% reduction; C: that's already a lot; P and MAT: that's not bad at all." (Discussion around Mélanie and Monia personas)*

The sufficiency practices presented and calculated for each persona were thus discussed in relation to wellbeing. This is interesting as it shows how practices that have a relevant potential for energy savings were considered in relation to how they may or may not satisfy needs. Participants related most of those practices to the capacity of satisfying needs.

Some of those practices were discussed as satisfying several needs at the same time, which makes them

even more interesting in relation to change. Those discussions allowed to discuss examples of practices that are plausible, have a real potential in terms of energy savings for the future, and can satisfy several needs at the same time - which allows to understand them as synergic *satisfiers*. Those synergic practices are synergic as they allow for more sustainable everyday dynamics while satisfying several needs. Those practices are for example reducing living spaces in relation to participation and affection , shifting to public transport in relation to subsistence and protection, or shifting work to have the possibility to work from home: for example, participants discussed the shift Audrey and Hussein operated in their professional life, allowing them to work from home, as satisfying several needs: *" I think they have a good life, as there if a balance, they are flexible with their jobs and free time, they are very self-determined"; "Also, for Audrey, feeling that she performs a valuable activity satisfies the need of 'to realize one's own idea of daily life'. (Discussion around Audrey and Hussein personas).*

Other practices and life dynamics related to sufficiency that go further were not calculated in relation to their energy savings potential, sometimes because they are difficult to calculate, were also mentioned by the participants in relation to needs satisfaction, that should draw attention: sharing spaces and creating local spaces in relation to subsistence, participation, identity, thinking about "urban mixing" where everything would be 15 minutes away by walk from the home, participative development through collective intelligence (for the development of a new neighborhood for example), etc. In relation to sharing spaces, community and community living through cooperative, among other example, was discussed as allowing to answer several needs.

> *"C: because it allows us to live well in a smaller home; G: bartering our skills ; B: that's what we do here ; G: it works well here, but how do you deploy it more systematically? G: and then everyone feels integrated into society, it's not because I'm a manual worker and you're an administrative person that I'm less valued, that's how we create links, how we create value for everyone" (Discussion around Audrey and Hussein personas about sharing spaces).*

Working less was also mentioned in relation to leisure and creation for example: *"C: Should part-time work be made available to everyone?!; N: In what sense? C: Well, in fact that... because today there are people who work part-time and would like to work more, but there are also a lot of people who work full-time and would like to find a part-time job but are having trouble finding one.. in some sectors of activity it's very difficult.... if you want a better life balance... and one of the elements is part-time work, well in fact in many sectors of activity it would be complicated!" (Discussion around Audrey and Hussein personas).* Working was also strongly related to other sufficiency practices, as detailed in the paragraph below around the interrelation of practices.

d. Interrelation of sustainable practices for needs satisfaction

While showing that sufficiency practices are relevant in terms of energy savings in the future while being synergic in relation to wellbeing, it is not that easy and nuances were discussed during the workshops within the discussions around sufficiency practices in relation to needs. First, questions of access to resources were taken into account. Then, if some sufficiency practices could be considered as satisfying fundamental needs by themselves, it was discussed that most of them cannot be understood as synergistic if considered alone. In specific situations, the performance of sustainable practices has to be considered in interrelation in order for them to allow for needs satisfaction. In that sense, some practices are interrelated in how they can satisfy needs. For example, when thinking about changing diet or reducing the amount of food purchased, people need more time to shift their practices and still satisfy needs - more time to go to specific shops, to think about specific recipes, etc. This shows how working less can and must be understood in relation to changes in food practices for example. Another instance can be mentioned around the interrelation of reducing living spaces and sharing spaces, as living in smaller accommodations can keep need satisfaction unmodified and even increased if people have access to shared spaces where they can perform practices but also interact with others.

> *"C: There's also the fact that you can reduce the size of an apartment, if in the neighborhood you have a co-working space, you have shared guest rooms, you have a place where you can organize a family meal with lots of people, well it's easier to have a smaller flat if you have shared things because it has less impact on your need to receive your family, to have space, etc. It's true that this aspect is a bit extreme.; G: if you have co-working spaces, then you don't need to work from home because sometimes you don't like working from home; C: and it creates inequalities between those who have space and those who don't" (Discussion around Audrey and Hussein personas).*

This shows how the performance of sustainable practices has to be considered in interrelation, as practices cannot be understood alone towards a just transition that considers needs satisfaction, but have to be considered together as a system.

e. Individual and collective changes

This brings to an important lesson from the workshops, in relation to the **divide between individual and collective changes**. Individual change was discussed in every workshop, mostly in relation to time management, self-improvement and reevaluating happiness perceptions in relation to the transition. However, the debate quickly and always led to discussions around measures that prioritize collective over individual changes. Participants realized that change need to happen at the collective level for people to shift their daily practices to less energy usage. One discussion illustrated well the notion of the scale of change, of collective change: *"Taking time, making time your own", "but it's not about making it your own, when you have a work schedule...I work 90%, I did all that during the Covid and now I don't do it any more... I don't have the time any more, it's a question of how life is organized...and I think this notion is important, but that's a societal question too, the way we're obliged to live (...) the way society obliges us directly or indirectly." (Discussion around what has to change for the transition).* People reflected on the scale of change, realizing that individual change wasn't enough for the transition and that collective changes had to come about at various levels. When discussing about change, one

participant stated: *"I would say that individual efforts are not enough ... I think that we are talking about collective action - there are a lot of things that can only be done by the state or by companies, there is a limit to what can be done at the level of the individual, the family etc.... for example in terms of transport, cars, in my opinion the state should revise taxation, to increase electric cars, and also companies and the state should put electric charging points just about everywhere... and companies should encourage the possibility of working remotely." (Discussion around Audrey and Hussein personas).*

Participants discussed the need for creating **conditions for people to change**, the need for offering a new organization of the conditions necessary for change: *" I: But let's say you want to have a collective impact at some point, there aren't a thousand solutions. I mean, you can't always rely on people taking the initiative. So it's clear that all the right conditions need to be in place for.... But in the sense that you have to create the right conditions to encourage people to do it. So yes... we might as well create a system, okay, well... like you were saying... with... housing, well... create a supply of housing that is adapted to our objectives in this area. So, it's a bit like: "Oh, give up your house, but we don't have a flat to offer you". Well, that's cool, but…, V: Yeah, in housing there's a whole organization that goes with it (Discussion around Isabelle and Philippe personas).*

Resources people have access to as well as norms are discussed as crucial drivers of changes. A discussion illustrates well the idea of shifting norms to support a shift in practices: *Participant 1 : « (..) before someone who smoked was accepted, it was almost cool even to smoke, and now it's no longer accepted and now it's like having a big car, well..."; Participant 2: "…it becomes old-fashioned..."; Participant 1: "... and she (Emma persona) talks about it a bit (...) the fact of taking the plane, I don't know, it's frowned upon, we have to manage to change that, it takes time but..."; Participant 3: "What becomes the norm? it's a bit of a question of what becomes the norm and what doesn't"; Participant 1: "...and it becomes cool to be sufficient", Participant 3: "…and that happens in the community. If there's a change in mentality at a collective level and the norm is reversed, well...". (Discussion around Emma persona).* Participants also discussed the place of individual within collective change processes, as illustrated by a quote around understanding inhabitants' needs before designing urban change*: "There are quite a few new neighborhoods being built in Geneva, but I think we also need to listen to the needs of the people in the neighborhood, because often buildings are built, more or less green spaces are built in the center of the buildings, etc., and in fact this is imposed on people and we don't know if it meets their needs (...).We often build these big blocks of flats, people move in and then we question people's needs, whereas I'd see it more the other way round, let's question people's needs so that we can adapt the buildings to their needs." (Discussion around Emma persona).*

Beyond the individual and collective divide, the analysis brought up a further tension, between two dimensions of collective change: the first dimension is related to **creating a sense of community**, living together, thinking together, inclusion, which can be understood in relation to the **collective as a practice around the notion of commons**, linked to the idea of everyone making an effort to create a collective change. An example of that was illustrated in a discussion about collective active actions that have a collective impact, as one participant argued about voting: "*RE: in collective I'd put stop voting liberal after all, right? (laughs) no, I think so, don't you? it's debatable, GI: that's an individual choice, not a collective one! RE: well, politics is collective ... it's voting for something that will affect the collective." (Discussion around Jasmine and Quentin and Audrey and Hussein personas).* 'The collective' can also be understood as a **level of action** and related to a set of measures, policies, regulations or a sphere of action that exists at the level of buildings, neighborhoods, towns, and cantons".

f. *Synergic collective changes*

Participants expanded beyond personas to envision **synergic collective changes** (satisfying various needs at the same time) **to support synergic practices**, with relevance at the policy level. The collective changes discussions revolved around government-imposed constraints alongside social justice considerations. (Notes from the discussions from various workshops). Several examples have been discussed in different workshops, some of them were recurring objects of discussion.

The idea of going from individualist lifestyle to more **community living** was discussed: "*V: The...yeah, and then maybe it also means...coming back to this concept or rather than having a... very large living space with a huge garden, well, more communal lifestyles where we can share houses for example. With the same comforts as we have. But that means giving up part of...your hyper-individualistic lifestyle to others in fact. I think [laughs]...". (Discussion around Isabelle and Philippe personas)*.

In relation to this idea, participants discussed the **mutualization and sharing of resources** in the form of land, as land is mostly inherited and it needs to be accessible to the public, but also in the form of knowledge, material, production means: *"J: The other point is to mutualize resources..., S "(...) I'm talking about resources, i.e., knowledge, equipment, tools (...) means of production..." (Discussion around Jasmine and Quentin personas).*

Participants discussed the idea that **more effective communication and that more discussion spaces have to be created**, where citizens can participate in decision-making and where they are being consulted, **creating interactive local places and promoting cultural activities around sharing** that could address several needs. Those could be really relevant as answering various needs at the same time: ***Affection*** - meet people; ***Leisure*** - have fun and organize events, sharing cultural activities; ***Understanding***: sharing experiences with local inhabitants; ***Identity*** - being part of something bigger that the self, the household or the family. In relation to participation, participants also discussed the **development of citizens assemblies** and the citizen participation through assemblies as an example of how to challenge pyramid decision-making: *"P: in terms of communication, with more exchange, and... (...) participation, what we're in the process of doing with citizen participation, S: what changes should be put in place so that residents have more decision-making power!, P: yeah! and so that it's less the politicians!, J: so citizens' assemblies, for example!, S: so it would be less pyramidal and more consultation, J: well, in fact you could say make it more fluid...". (Discussion around Jasmine and Quentin personas).*

In relation to the future of mobility, participants discussed the **development of affordable public transports** so anyone can have access to it, answering several needs: ***Subsistence and protection*** - going to work and having money for food; ***Participation*** - to social life; have a voice in society; ***Affection*** - move freely to meet people; ***Freedom*** - feeling free to go from point A to point B without difficulty; ***Identity*** - going to places to be part of specific groups.

Taxes on energy consumption were also discussed as relevant, if developed in addition to **quotas**: "C: I don't think we'll get by as long as we don't have individual quotas, S: That's regulations and limits" *(Discussion around Jasmine and Quentin personas)*. Participants discussed the fact that taxes are not enough as rich people will still be able to pay to consume indefinitely, and it would not take into account the absolute reduction in the constraints. They also discussed the potentials for the redistribution process such measures could bring, thus considering justice into the constraints. In relation to the landscape, the

participant discussed the **re-wilding** *("ré-ensauvagement")* of the city as a measure to allow for more nature in the city: *"C: but in any case the city could be deasphalted (less concrete), the streets, to put back some greenery, some freshness..., S: it's depaving the soil, C: yeah well if you deasphalted you also depave, a priori, well unless you put something other than asphalt which is also paving (laughs)" (Discussions around Jasmine and Quentin personas).*

All of those examples that were discussed in the workshops have been considered in the analysis as synergic, as they pave the way for more sustainable futures while allowing to answer several needs at the same time. More examples of changes and specific applications taken from the various workshops' discussions are detailed in the table below. This table is a summary of the discussions on changes from the different workshops. Not all inputs were discussed in every workshop, but the ideas of creating public, interactive local spaces, and developing affordable public transportation were common to all. The first column exposes a broad idea of what people discussed as important in the future, and the second column exposes more precise changes or paths for change discussed in relation to what is important.

Table 2: Examples of policy recommendations discussed during the workshops

Examples of changes needed	**Examples of application**
Discussions on the value of **time** and the need for more free time in everyday life	Changing the way individual's participation to the economy is organized through employment: eg. flexible work time arrangements, reduced working hours without consequences for pension funds
Issues of **ownership** in relation to mobility and space	Supporting car sharing and developing spaces for sharing (eg. appliances) and cooperative housing.
Collective action towards **children** involvement in the energy transition	Involve children in the energy transition specifically in relation to competences (through education) and access to specific relevant spaces
Greener and more **participative development** of alternatives for **urban planning** (public spaces that consider the users' needs)	Support participatory work prior to the construction of living spaces - cooperative management systems, collective intelligence
Relocalization of production and supporting **local consumption**	Offer agricultural spaces to plant vegetables, trainings for people who start their own gardens, and exchange system in the garden sector
Support of access to **relatable information** and data on consumption for citizens	Support the diffusion of information relevant for the energy transition: eg. on how much reduction has been achieved during a specific period, on the positive consequences of reduction measures

Support of large endeavors in public and private **organizations** - in relation to management or corporate consumption	Support the spread of a 'responsible' label so that companies (of all sizes) consume less and encourage their employees to consume less
Regulation of **advertising** on specific high impact products	Support a better understanding and consideration of the impact of social networks on consumption habits
Support **citizens education** and access to **collective spaces for discussion** and reflection	Support the creation of vibrant, interactive collective local spaces
Support the **social link** that will help the transition - rethink as a whole	Support the promotion of shared cultural activities
Collectively support a shift in what is considered as **normal**	Support a shift to a 'new normal' in relation to relevant domains: e.g., Introduce half a day without internet in the city, half a day without cars, etc.
Collectively support equal access to **sustainable options** in relation to the relevant consumption domains	E.g., Develop affordable public transports so anyone can have access to it

In order for people to change their practices in a just energy transition, changes need to happen at the level of policies to support practices that are sustainable and allow to satisfy fundamental needs and avoid inequalities in the face of change. Sufficiency practices were discussed in relation to change and what changes are shown in the personas or what else could and should happen at the community and policy level to support them further. Just as sustainable practices need to be interrelated for their performance to still satisfy needs in the future (as shown in section d), support of such practices need to happen at the collective level for them to still satisfy need, especially in relation to inequality. A discussion on Audrey and Hussein personas shifting professional life towards jobs that make sense to them and allow them flexibility in their daily life shows how state support is needed to ensure that needs satisfaction is not hindered:

> *"N: Helping others yes, it's they who protect others I would say by their choice...; G: they were also helped in their retraining; C: you don't get the impression that they lack security; S: but they have that because they created it; C: I find that with the history of employment and the help with retraining, it's a way of... it's something that's lacking today... I'm a bit biased because I'm in the field... but I find that today people who want to retrain to be green don't have enough support" (Discussion around Audrey and Hussein personas shifting jobs and Audrey creating her own company).*

These discussions make the concept of *synergic satisfier* even more relevant in relation to the energy transition as they elicit examples of synergic practices - that have a great potential in relation to energy

savings, allow to satisfy several needs at the same time - that can be supported at the collective level through synergic changes, allowing to discuss what can be done to support the development of such practices now and in the future. Considering synergic collective changes supporting interesting synergic future practices is also really relevant in relation to the notions of a just transition, as they allow to discuss a broader access to the opportunity for change in practices.

g. Inequalities and the unequal distribution of effort in relation to change

The personas played a pivotal role in sparking discussions about **inequalities and the unequal distribution of effort in relation to change.** Participants contemplated the disparities in the face of transformation. These conversations shed light on the choices individuals make in the context of their unique circumstances and resources. Discussions further delved into the complexities surrounding accessibility and privilege, highlighting how factors such as location and resources can impact the ability to adopt sustainable practices. A lot of conversations focused on addressing inequalities in adopting changes, recognizing that not everyone can change in the same way. Discussions highlight societal inequalities in the face of change, emphasizing the need for equal access to alternative options: *"In the Geneva countryside, it's difficult to get around by bus. In the city center, it works very well, but in the Geneva countryside, it's complicated. The reality is that I need to arrive on time, I don't have much time, etc.", "It's the responsibility of politicians to say that we're going to create a strategy for a public transport network that's also connected to the Geneva countryside, so that people have an alternative." (Discussion around inequalities of access to public transportation).*

The analysis of such discussions on the unequal effort required to change brought up a divide between **two dimensions of inequalities in relation to change** that are crucial to take into account when imagining the transition. First, inequalities in relation to who has to change*:* we cannot ask everyone to change the same way, and the privileged class needs to take responsibility and act. Then, the inequalities in relation to the opportunities and the need for making sure at the collective level that alternatives are available to anyone, and that the transition is not exacerbating already existing inequalities. Those two dimensions allow to consider the importance of a *"just transition: shared and fair efforts, balance between effort and wellbeing" (Poster around Isabelle and Philippe personas).*

3.3 Policy implications: organizing desirable, collective futures

When thinking about the practical application of such results and what lessons to take from the conduction of the workshops, several methodological and conceptual results can be highlighted, in relation to the methodology used and the approaches proposed, but also empirical inputs that are important in relation to policy relevance.

The workshops showed that the original methodology used in the form of personas, linked to wellbeing through the concept of needs, was relevant to discuss the energy transition. Indeed, it proved to be a good way to **make the abstract comprehensible** (the abstract energy transition and what it means in relation to everyday life*)*, facilitated the discussion on the future of practices and the possible changes that would and should come about. The methodology allowed for an **entry point into discussing** a just transition, linking present life and consumption to the future, exposing the energy impact of our daily routines, while creating a **sense of community around everyday future challenges**. The workshops also showed that the methodology proposed was relevant in order to **challenge assumptions around the future and the transition**, and creating **self-reflection in relation to the present**. People discussed **alternative future orientation of practices for the good life**, and were empowered to imagine the local future landscape they will live in. The methodology and approaches used must not be taken as the only solution to discuss the future of energy consumption, and methodological and conceptual issues that were faced are also important results, notably in relation to the personas as representation of (an) uncertain future(s), and the importance of subjectivity when imagining what the good life could look like.

The workshops allowed for interesting input that could be taken into account in the discussions around what life should look like in the future, and how to best support such imaginaries. The participants discussed **alternative satisfiers** at the collective level, which were seen as crucial in order for a shift in how practices are performed today towards how they could and should be in the future. In relation to alternative satisfiers, participants discussed the promising sufficiency practices presented in the personas as satisfying several needs, and some several needs at the same time. In relation to those promising synergic practices, participants discussed that in specific situations, the performance of sustainable practices has to be considered in interrelation in order for them to allow for needs satisfaction. Conclusions were made on the idea that the performance of sustainable practices has to be considered in interrelation, as practices cannot be understood alone towards a just transition that considers needs satisfaction, but have to be considered together as a system. Those discussions allowed to discuss examples of **interrelated promising synergic practices**: as they are plausible, have a real potential in terms of energy savings for the future, and can satisfy several needs at the same time if understood together. Going away from an individual dimension of the transition, the workshops led people to discuss **synergic collective changes** in relation to synergic practices- transformations that could simultaneously satisfy multiple needs and contribute to more sustainable futures. The fact that these changes could satisfy several needs at the same time was claimed by the participants in a few instances, and interpreted in the analysis based on existing knowledge: for example, community living has been argued in other work to be a synergic satisfier (Guillen Royo 2010). These changes weren't just theoretical; participants explored concrete applications, particularly at the local level. Those synergic changes can be imagined at the collective level in order to support synergic sustainable practices – that can be considered as satisfiers of needs. The participants came out with specific examples of synergic changes imagined at the collective level. The workshop analysis demonstrates the practical applications of synergic changes discussed that can satisfy a range of needs while paving the way for a more sustainable future, not only at the local level but beyond. Those change should be considered as

interesting synergic satisfiers as they were deliberated and discussed in participatory settings, thus giving a voice to the practitioners (users of the space, of the alternatives) while they are relevant for a future were changes support more sustainable practices and ensures the satisfaction of wellbeing for all. The analysis of the discussions around synergic satisfiers also emphasized an important distinction when it comes to collective change: collective can be understood in relation to being a community, living together, thinking together, inclusion, representing the '**collective' as a practice around the notion of doing things in common**, linked to the idea of everyone making an effort to create collective change together. '**The collective' can also be understood in relation to the level of action**, as a set of measures, policies, regulations or a sphere of action that exists at the level of buildings, neighborhoods, towns, and cantons. This distinction is relevant in relation to the imagination of synergic measures that could support synergic practices: **we need collective measures to support collective *doings***. Inequalities in the face of change were also a recurring object of discussion in the workshops, which is interesting as well as reassuring given the importance of aiming for a just transition. The analysis highlighted **a distinction when it comes to considering inequalities in relation to change: inequalities in relation to who has to change** – in relation to who has the more impact and the more room for improvement, and **inequalities in relation to the opportunities to change and the need for alternatives** supported at the collective level. This distinction is also crucial when discussing the transition – and in relation to the notion of synergic collective changes – as it allows us to reflect on how to **best act to make change happen where it needs to, while ensuring that inequalities are not exacerbated in the process.**

4. Conclusion

The participatory workshops introduced an **innovative methodology** centered on **fictive personas** from the year 2035. These personas served as narratives to collectively envision alternative futures in the context of the energy transition. The workshops provided a platform for participants to engage in **collective discussions** about the energy transition, employing personas as a means of fostering dialogue and understanding. Central to these discussions was everyday life in the future, in an energy transition. The discussions were around tradeoffs between the good life and energy savings, as well as how to organize collectively to bring about sustainable wellbeing in the future. The methodology allowed to: respond to fundamental needs, challenge established notions such as teleoaffectivities, wellbeing considerations, and perspectives on change. The discussions on the personas considered in relation to wellbeing also proved relevant towards the designing of changes that take into account the realities of the users. The methodology of personas and workshops can be translated to other contexts, countries, regions or cities and a ***WEFEL Tool Kit*** that is available for free to facilitate the use of personas in participatory settings. This toolkit can be used in various contexts, including workshops involving citizens, municipalities, public actors, associations, companies, organizations, schools, and more. People interested in such a methodology are welcome to download this toolkit on the project website. The toolkit and related material will be made available in **French** and **English** (German version can be made available upon request).

Another significant aspect of the workshops was around **collective planning for the energy transition**. Participants engaged in discussions aimed at imagining and discussing alternative satisfiers in the form of promising interrelated synergic practices and considering synergic collective changes. These discussions led to valuable proposed solutions that can lead to reflections in the context of policy development. A ***policy brief*** will be made available in 2024.

5. Evaluation of results to date

As detailed above, the project has achieved the results it set out to : 1) We have piloted the design of personas from the future that represent what living in an energy transition might look like in 2035, with input from multiple actors, including scientists and citizens; 2) We have quantified and qualified energy savings when it comes to what the energy transition might bring by 2035, and have done so in relation to income quintiles; 3) We have co-designed workshops, between scientists and a community energy association Terragir, that were relevant to the project interests; 4) We have conducted participatory workshops gathering 154 people in Switzerland (mostly Geneva), allowing us to discuss the personas and the future of energy consumption in relation to specific considerations of wellbeing with citizens. Finally, the energy saving potential account have been updated to come to aggregate calculations, and workshops have been analyzed through specific angles, in order to answer the project research questions.

As such, we have finished the main tasks of the project: 1) Going from scenarios to everyday practices from the future, 2) quantifying and qualifying different energy savings when it comes to what the energy transition might bring by 2050, and 3) designing and conducting the workshops with citizens, discussing the wellbeing dividend, or whether it is possible to imagine an energy transition where human wellbeing – at the collective and individual level – is not compromised, 4) analyzing the data and making sense of them. We've then finalized what represents the fifth task of the project, namely the deliverables, that are detailed below.

Deliverables

Following the conduction of the workshops and the analysis of the data, several deliverables have been shared with the SFOE and been made available - for some of them.

- **Interim reports (not public)**: two interim reports have been submitted before this final advancement reports, to account for each project's year achievements and the next step.

- **Results reports (not public):** other reports were meant at describing the project actual processes and results, in the number of three, detailed below.
    - **First report (D2, August 2021)**: ***Scenario evaluation and trade-offs estimation towards designing narratives of the future.*** This report proposed an introduction to the conceptual framework used for the project, and a description of the translation of energy scenarios into everyday practices. It also presented the method for calculating energy savings potentials based on those everyday practices.
    - **Second report (D1, March 2022)**: ***Personas narrative development process and application.*** This report summarized the personal development process from the scenarios to everyday practices, and to the narrative in the form of personas from the future. It then proposed a description of each persona. It explained the energy savings potential calculated in relation to each persona, and how we planned to use the narratives with citizens.

- **Present final report (public):** ***Planning for the good life - the significance of sufficiency, wellbeing, and collective solutions for sustainable energy futures.*** This present report proposes a description of the project and its objectives, an exposition of the procedures conducted, a discussion around the results of the project and the policy implications, a presentation of the deliverables, and a reflection around further research in relation to the project.

- **A Tool Kit (public):** ***A WEFEL Tool Kit for conducting discussion and planning workshops on the energy transition***

In relation to using narratives in the form of personas in participatory settings, the workshops results allowed the research team to design a tool kit for planning and conducting workshops on the energy transition. The tool kit is a versatile resource designed for a wide range of settings, whether it's in schools (starting from secondary level), businesses, public institutions, or even within local communities. It serves as a guide through every phase of the workshop, from introducing the personas and the wellbeing approach to managing discussions. The tool kit will be shared with various audiences, as a listing has been completed during the project of people who were interested by the personas and their use to discuss the energy transition. This goes from municipalities in Switzerland (e.g., City of Geneva, City of Nyon, etc.) to associations and foundations (e.g., Terragir, Sanus durabilitas), canton level administrations (e.g., Environmental, Education departments, etc.). ***At the time of the report (July 2024), the Toolkit is available in French, and will be made available in English by mid 2024.***

- **Academic papers (public)**
    - A first paper has been published in *FUTURES* on the process of going from energy scenarios to personas from the future living in Switzerland.

    Sahakian, M., Moynat, O., Senn, W., & Moreau, V. (2023). How social practices inform the future as method: Describing personas in an energy transition while engaging with teleoaffectivities. *Futures*, 148, 103133. https://doi.org/https://doi.org/10.1016/j.futures.2023.103133

    - An academic paper has been written and submitted thate focuses on the workshops results focused on needs and how the participatory workshops helped to strengthen a discussion around energy transition in relation to wellbeing.

    - Another academic paper is underway focused on the energy saving potential calculations and how they were discussed in the workshops. This paper will address the importance of such calculation in relation to inequalities in the face of change, and how people discussed them, especially in relation to collective changes.

More details on the academic papers are presented below in the *Communications and publications* section.

6. Outlook and next steps

Reflections will be conducted in the following months on the project results around energy potentials in relation to wellbeing and around energy potentials in relation to inequalities in the face of change. Those reflections will be presented in two different papers that are developed below in the communication and publication section (8).

Further, and based on the results of the project, Orlane Moynat (PhD student and researcher on the WEFEL project) will develop some further reflections in the introduction and conclusion of her thesis manuscript:

- Reflections around what discussing alternative narratives in participatory workshops in relation to needs teaches on the wellbeing approach in relation to the transition. This would be done in the form of a critical reflection around eudemonic approaches to wellbeing, or

the importance of considering hedonic approaches to wellbeing when discussing the energy transition.
- Reflections of policy relevance in relation to the concept of synergic practices and synergic changes, and how to conceptualize the translation of small-scale workshops discussions into policy relevant reflections.

The project and results showed the relevance of using stories from the future to collectively discuss the energy transition, the importance of considering wellbeing in the discussions, and the challenges around it especially in relation to the concept of a just transition. In that sense, the team hopes to be able to largely diffuse the methodology and tackle the interest of various public, and the reflections around the policy relevance of the workshops inputs.

7. National and international cooperation

To date, we have benefited from various forms of cooperation in order to reach the project's objectives.

- A complementary grant from the ASSH allowed us to host two workshops, in order to gain feedback on the personas. A partnership with Helvetas and their Global Happiness Exhibition also helped us to conduct one of those workshops.

- A complementary grant from the City of Geneva allowed us to translate the personas in a quality comic style format, for the 5 personas we designed, and two comic boards per persona.
- A partnership with the City of Carouge allowed us to conduct a very successful workshop in Carouge on May 28, 2022 (workshop 1 detailed in section 3) – this collaboration represented a crucial help in the recruitment strategy and the organization of the workshop (also detailed in section 3).
- Exchanges were made with a research group working on cartoons at the University of Cambridge. We met during the SCORAI-ERSCP conference in Wageningen in July 2023, and again at the ESA RN12 in Trento in September 2023. These exchanges following our respective presentations allowed the WEFEL team to present the personas and get feedback from researchers actually working on personas, and to imagine further scientific collaborations.

8. Communications and Publications

We had the opportunity to share the ideas of the project and our reflections. The communications and publications that have been conducted this year as part of the project are presented below in chronological order.

- First, the WEFEL project benefits from a dedicated **web page** on the University of Geneva's website, allowing the team to share information and to keep in touch with the community of citizens and other actors that have been involved throughout the project thus far. This page has been updated and developed in the past year.
- The workshops results have been presented to date at a series of academic conferences:

Scientific Conferences	**Network**	**Location**	**Dates**
Energy and Climate Transformations: 3rd	Energy Research & Social Science,	Manchester (UK)	20-23.06.2022

International Conference on Energy Research & Social Science			
International Forum for Well Being 2022 *(Forum International pour le Bien Vivre 2022, Tenir ensemble le cap d'une société juste et soutenable*)	Cap Bien-vivre *Conference gathering academics, civil society, and citizens*	Grenoble (France)	29.06-01.07.2022
EASST 2022 - The politics of technoscientific futures	European Association for the Study of Science and Technology	Madrid (Spain)	06-09.07.2022
Sociology of consumption 2022 Midterm meeting - Consumption, justice and futures: where do we go from here?	ESA; RN05 - Sociology of Consumption network	Oslo (Norway)	30.08-02.09.2022
Transitioning to Systems of Sustainable Consumption and Production: From Knowledge to Action	Future Earth Network Conference	Online	14.11.2022
Transforming Consumption-Production Systems Toward Just and Sustainable Futures	SCORAI-ERSCP-WUR	Wageningen (Netherlands)	05-08.07.2023
Energy, Environment and Societies in Crises	ESA RN12 mid-term and Energy and society Network 6th international joint conference	Trento (Italy)	06-08.09.2023
Frictions Urbaines	Urban Hub Genève and ERC GANGS project	Geneva (Switzerland)	04-06.10.2023
Déjeuners sociologiques	Department of Sociology	Geneva (Switzerland)	02.10.2023

- In addition, we have had the opportunity to present the personas design process and some workshops results in the following instances:

Other Presentations	**Audience**	**Location**	**Dates**

Utopia – les mondes imaginaires de la littérature mondiale	Students in a literature course at the University of Geneva	Geneva	29.11.2021
Imaginer la sociologie	Sociologists, University of Geneva	Vaud	16.06.2022
La Ville du Futur	Parti socialiste, Ville de Genève	Vaud	12.11.2022
Moins c'est mieux	University and public	Lausanne	30.05.2023
GROUPE E	Executive board members	Lavey-les-Bains	31.08.2023

- An academic paper has been published as part of a special issue on net zero transitions in the prestigious FUTURES journal. The paper was submitted in April 2022, then again after double-blind peer review in October 2022, and published in April 2023.

How social practices inform the future as method: Describing personas in an energy transition while engaging with teleoaffectivities.

Reference*: Sahakian, M., Moynat, O., Senn, W., & Moreau, V. (2023). How social practices inform the future as method: Describing personas in an energy transition while engaging with teleoaffectivities. Futures, 148, 103133. https://doi.org/10.1016/j.futures.2023.103133*

In the sociology of expectations, the future is seen as performative in the present: how energy futures are imagined has consequences for how the energy transition might be enacted today. This contribution discusses the conceptual and methodological work undertaken to develop personas from the future, on their way to the policy aim of so-called 'net zero' carbon emissions by 2050 in Switzerland. Social practice theoretical reflections contribute in three ways: conceptually, in recognizing the future orientation of teleoaffectivities; methodologically, for describing personas engaged in future practices; and towards reflexivity, in how imagining futures might affect social practices today. Moving from policy-relevant to practice-oriented energy scenarios is described as an iterative process that involves different stages of consultation. The process is not without tensions, calling into question how change is understood, and revealing the strengths and limits of trans- and inter-disciplinary approaches. A social practice-based approach provided a method for rich descriptions of futures, moving beyond changes to technologies that are ubiquitous in energy scenarios, to also include changes in meanings and competencies, as well as broader sociocultural dynamics. The treatment of the social energy futures in cartoon form and through storytelling also allowed for a more compelling and engaging representation of the future, which might affect teleoaffectivities in the present.

- Another academic paper is underway, led by Orlane Moynat, on the workshop results that were presented twice this year as part of international conferences. The paper will focus on the results

in relation to the following research question: *how did the personas discussed in participatory workshops helped strengthen the links between the energy transition and wellbeing?*

- One further paper is planned, led by Vincent Moreau, on the energy savings potential calculation and what it brought in relation to the energy transition, especially discussing inequalities in relation to change for the transition.
- Further reflections will be led in relation to what discussing alternative narratives in participatory workshops in relation to needs teaches on the wellbeing approach in relation to the transition, and how to conceptualize the relation between participatory discussions to policy relevant reflections. This is planned as part of Orlane Moynat's thesis manuscript conclusion but might become a scientific paper.

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