

Sustainability aspects of housing

*Živa Kristl**

ABSTRACT

Although European environmental and climate policies have helped to improve the state of the environment in recent decades, various reports suggest that Europe is not progressing fast enough and that the prospects for the environment in the coming decade are not good. It is becoming more and more obvious that in order to reduce the impacts of climate change, a rapid transition to a sustainable lifestyle will be necessary, along with the simultaneous adaptation of the organization of society, institutions and infrastructure. Sustainable transformation requires policies that take into account the global consequences of individual lifestyles. This is also the subject of this article, which deals primarily with some trends in the field of user lifestyles related to real estate. With the help of a literature review, three issues are discussed, such as the impact of household consumption, green decisions and the sufficiency approach, and the representation of the sufficiency approach in current climate scenarios. Household consumption has a significant carbon footprint; therefore, it represents a great potential for reducing environmental impacts.

Keywords: real estate, green transition, lifestyle, carbon neutrality, sufficiency

* Nova univerza, Evropska pravna fakulteta, Slovenija, Ljubljana, ziva.kristl@epf.nova-uni.si.

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POVZETEK

Čeprav so evropske okoljske in podnebne politike v zadnjih desetletjih pomagale izboljšati stanje okolja, različna poročila nakazujejo, da Evropa ne napreduje dovolj hitro in da obeti za okolje v prihodnjem desetletju niso dobri. Vse bolj postaja očitno, da bo za zmanjšanje vplivov podnebnih sprememb potreben hiter prehod v trajnosten življenjski slog ob sočasni prilagoditvi organizacije družbe, institucij in infrastrukture. Trajnostna preobrazba zahteva politike, ki upoštevajo globalne posledice posameznih življenjskih slogov. Temu je posvečen tudi ta prispevek, ki obravnava predvsem nekatere trende na področju življenjskega sloga uporabnikov, povezanih z nepremičninami. S pomočjo pregleda literature so obravnavana tri vprašanja, vpliv porabe v gospodinjstvih, zelene odločitve in zadostnostni pristop ter zastopanost zadostnostnega pristopa v trenutnih podnebnih scenarijih. Poraba gospodinjstev ima znaten ogljični odtis, zato predstavlja velik potencial za zmanjšanje vplivov na okolje.

Ključne besede: nepremičnine, zeleni prehod, življenjski slog, ogljična nevtrálnost, zadostnost

1. Introduction

While European environmental and climate policies have helped to improve the state of the environment in recent decades, the report 'European Environment - State and Outlook 2020' (SOER, 2020) suggests that Europe's progress toward carbon neutrality is not fast enough and that the outlook for the environment in the coming decade is not good. Of particular concern is the rate of biodiversity loss, the increasing impacts of climate change and the overexploitation of natural resources. Overall, environmental trends in Europe have not improved since the last EEA State of the Environment Report in 2015 (SOER, 2020). The assessment finds that most of the 2020 targets will not be met, critical are especially the biodiversity targets. The report of the European Environment Agency (SOER, 2020), however, states that with increased public awareness about the need to transition to a sustain-

able future, technological innovations, increasing community initiatives and strengthened EU action, such as the European Green Deal (COM 640 final, 2019) there is still reason for hope. In the industrial field, Europe has made significant progress in the field of efficient use of resources and the circular economy. But recent trends show that the progress is slowing down in areas such as reducing greenhouse gas emissions, industrial emissions, waste generation, improving energy efficiency and the share of renewable energy. Projections show that the current rate of progress will not be sufficient to meet the 2030 and 2050 climate and energy targets (SOER, 2020, p. 12).

According to IPCC (2021, p. 12) forecasts, regardless of the emissions scenario, the global surface temperature will continue to rise until at least the middle of the century. Many changes in the climate system become larger in direct relation to increased global warming. For example, due to past and future greenhouse gas emissions, changes are irreversible and will last for centuries or millennia, especially changes in oceans, glaciers and increased level of oceans. We already know that global warming of 1.5°C (UNEP, 2020, p. 26) is most likely to be exceeded in the 21st century, and a temperature increase of at least 2.4°C or even 3°C is expected. This means that, on current trends, the average air temperature in central Slovenia will increase from today's 9°C to approximately 11°C (ARSO, 2018, p. 5) or more. Major climate changes will also cause increasing damages from extreme weather events. In Europe, for example, the percentage of flood damages for the period 1970-2005 represents almost 40%, storms 20% and extreme temperatures 14% of all natural disasters (ARSO, 2010, p. 43). Moreover, economic losses due to climate change are becoming increasingly encumbering (EEA, 2022). Forecasts show that, depending on the level of mitigation of the changes, in the year 2100 the average loss of global annual GDP will be between 1.5% and 3.3% (Aligishiev et al., 2022, p. 24).

UNEP (2020, p. 75) therefore predicts that in order to reduce the impacts of climate change, a rapid transition to a sustainable lifestyle will be necessary, along with the simultaneous adaptation of the organization of society, institutions and infrastructure. It is important to emphasize that household consumption accounts for approximately two-thirds of global greenhouse gas emissions. For example, Ivanova et al. (2016, p. 528) estimate pop-

ulation emissions (lifestyle and consumption) at 65% of all global emissions. Reaching a more sustainable consumption, however, presents a serious challenge due to the existing economic paradigm which is based on constant growth, primarily driven by consumption (Song et al., 2019, p. 1). As consumption is embedded in the economic system and mindsets of the consumers, the central goal of the transition is modification of meaning “progress” and “wealth”, and shift from the accumulation of goods and the use of energy-intensive technologies toward increased wellbeing (Ditmar et al., 2014). Ultimately, achieving a low-carbon lifestyle will require changing deep-rooted socioeconomic systems and cultural conventions. Currently, average CO₂ emissions per capita vary considerably across countries. According to some figures, US per capita emissions are about 17.6 tonnes of CO_{2e}, about 10 times higher than India’s 1.7 tonnes per capita and slightly higher than the European Union and the United Kingdom combined, where the average emissions footprint is about 7.9 tons per capita (Ivanova et al., 2016, p. 62). UNEP (2020, p. 65), on the other hand, estimates that housing, transport and food are the three main areas of influence with the largest CO₂ emissions, but also with great potential for mitigating climate change. As suggested above, sustainable transformation requires policies that take into account the global consequences of individual lifestyles. In this context it is encouraging that the emerging sufficiency trends, especially in the developed western countries support the tendencies toward a more sustainable lifestyle. As Osikominu and Bocken (2020, p. 2) point out, this often includes a decision for a lesser income and a lower consumption in exchange for e.g., more leisure time. Furthermore, Wynes and Nicholas (2017) suggest that the most efficient emission reduction actions are a smaller family, car free life, avoiding flying and plant-based diet. Actions including energy efficient home, reduced consumption and limited waste generation have moderate impacts. In the context of sufficiency and residential space, this combines into a smaller, simpler and energy efficient dwelling, positioned close to local resources.

Nevertheless, research in this field is still limited. For example, Osikominu and Bocken, (2020, p. 2) note that the largest number of studies on voluntary simplicity were conducted in the USA followed by some studies in the UK. The researchers come from various fields like sociology, psychology and marketing. They fur-

ther suggest that attempts by researchers to define the voluntary simplicity in more detail did not generate a consensus within the academic debate yet. Many times, the concept has no common criteria or lacks underpinning data. Often, the term is also used in conjunction with downsizing and simplicity. Moreover, the concept is strongly linked to North American and similar Western societies and does not include other parts of the world. There is currently only a limited number of research on changes in current lifestyles and future trends in the field of built environment, but they do not cover important issues linked to climate induced and sustainable changes in lifestyles. Indeed, much more research is needed on this topic, especially in the area of sufficiency lifestyles linked to dwelling.

The aim of the paper is a literature review, through which the emerging trends in the field of user lifestyles related to dwelling are identified. More in detail, three issues are addressed: the impact of household consumption, green decisions linked to sufficiency lifestyle, and the representation of the sufficiency approach in current policies.

Due to the small volume of literature on the topic, a literature review in the first step was performed with the help of databases such as ScienceDirect, World of Science and Emerald. The keywords: real estate, green transition, lifestyle, carbon neutrality, sufficiency was used, which were combined with each other in different ways in order to obtain as many resources as possible. In the next step, the search was expanded with the additional keywords: voluntary simplicity and downsizing. The search yielded many titles, but after a detailed review, only about 20 studies were included in the shortlist of the searched literature. These were included in the review. The studies were processed on the basis of topics that will be processed in more detail, namely the impact of household consumption and the concept of sufficiency linked to green decisions, and the representation of the sufficiency approach in current climate scenarios.

The literature review is intended to show which areas are underrepresented in the research and can serve as a guideline for further research. In addition, for professionals it can show current trends and indicates directions for the future practices and business opportunities. For policymakers, this research may show the main impacts of household consumption in various fields and can

indicate pathways to mitigate them through legislative measures and other policy approaches.

2. Household emissions

Household consumption is a significant contributor to greenhouse gas emissions. Globally, the share of the household carbon footprint – greenhouse gas emissions directly generated and indirectly caused by household consumption – caused approximately 60% of global greenhouse gas emissions in 2007 (UNEP, 2020, p. 532). About 20% of global greenhouse gas emissions in 2007 came directly from household consumption (mostly fuel for heating, cooling, cooking and the use of personal vehicles) (Ivanova et al., 2016, p. 530).

Household carbon footprint is, though, closely related with economic development level (Yu et. al., 2022, p 1). Discussions to date regarding the reduction of greenhouse gas emissions in households mainly focus on lower energy consumption and obstacles to the implementation of existing building renovation measures, especially of buildings constructed after 1960 (Antonič Kogoj and Kristl, 2022, p. 81). Some authors, however, note that the need for energy renovation is equally urgent for older buildings, even if they have already been renovated, as they need further interventions due to stricter legislation and the transition to a carbon-neutral society (Johansson et al., 2016). Measures for energy renovation of buildings are also important in wider context, e.g., for decarbonization of cities (Caro et al., 2021).

Household carbon emissions need to be placed in a broader context. Understanding how the consumption of certain goods and services contributes to global greenhouse gas emissions has an important impact on defining consumer strategies to mitigate climate change. Due to global trade, emissions caused by household consumption can also occur abroad. Let's take households in the EU and the US as an example. Europeans have one of the most unsustainable lifestyles in the world (Ivanova et al., 2016, 2017). On average, European households emit up to 20 t of CO₂ per inhabitant annually (Ivanova et al., 2017, p. 3). Only 20% of these emissions are related to household fuels, while the majority of emissions are embedded in consumer products and services (Ivanova et al., 2016, 2017). In addition, Europe is a net importer

of carbon resources and emissions, with around half of its carbon footprint occurring abroad (Tukker et al., 2016).

Song et al. (2019, p. 1) note that US household consumption is a key driver of the global economy, but also has a significant carbon footprint. They find that the annual carbon footprint of US households is increasing. It averaged between 17.7 tCO_{2eq} per person in 1998 and 20.6 tCO_{2eq} per person in 2009. Overall, US household expenditure on transportation (29.8%) and housing (33.6%) contributed more than 60% of the total domestic carbon footprint in 2009. Expenditure on services, food and clothing contributed 19.3%, 16.7% and 0.1% respectively. The utility subcategories (electricity and natural gas) and fuel consumption (mostly gasoline and diesel) together contributed almost 50% to the total domestic carbon footprint. In contrast, transportation expenditure per US household contributed only 17% of the overseas carbon footprint, while housing became the most important factor (34.7%). Among all subcategories, food, equipment, supplies, and clothing are the three largest contributors to 40.8% of the total overseas carbon footprint of US households. The authors note that the share of the overseas carbon footprint has been increasing and in 2006 amounted to 20.4%. This was mainly due to spending on clothing, equipment, supplies, electronics and appliances (Song et al., 2019, p. 7). Yu et. al. (2022, p 1), however, note that in fast developing economies, carbon footprint is increasing also due to domestic consumption. For instance, consumption expenditure was the major positive driving force and technology was a major negative driving force in China, while Japan was mainly driven by technology. The same authors suggest that transportation and communication can be a potential source for reducing carbon footprints. Another finding is that food carbon footprint will probably decrease, while housing carbon footprint will increase with economic development.

It is worth noting, that household consumption and thus carbon footprint is directly related to household income. Song et. al. in their latest study (Song et. al., 2022, p 1) suggest that the top 20% income households were the main contributors to the emission increase before the peak around 2006, while the medium and lower income households were the emission mitigation leaders after 2010. Emissions from certain consumption categories of the top income households are significantly higher than of the lower in-

come households with increasing trends, especially services and goods related to leisure. This suggests that policies should primarily address the emission-intensive expenditure of households and high-carbon consumer groups.

3. What is sufficiency and what are its impacts

According to Jackson, sustainable lifestyles can be broadly defined as “living well within the Earth’s limitations” (Jackson, 2011, p. 88). Awareness of climate change in the general public is increasingly beginning to influence the transition to a more sustainable way of life. A sustainable lifestyle is emerging as a choice for many consumers, especially in the group of millennials and post-millennials. This also means that researchers highlight the role of identity and consumption culture as central principles of lifestyle factors that need to be taken into account (Su et al., 2019). When exploring how well the technical, economic, social and behavioural patterns of building users are considered and which measures to choose, Antonič Kogoj and Kristl (2022, p. 97) note that the general measures are not effective enough and that it would be prudent to adapt them to individual population groups according to the type of building they live in and their socio-cultural status. In the particular case they explored it showed, that the consequences on buildings are clearly visible, while the technical, economic, social and behavioural patterns are less detectable and therefore do not play the central role in decision-making. The situation is somewhat better in the field of regulatory and financial challenges of sustainable renovation, as some studies have already been carried out on this topic and pointed to certain challenges linked to implementation of regulations and financing opportunities. In the future, an opportunity for improvements is mainly in the interconnectedness and cooperation of the managers of residential buildings and other stakeholders.

In analysing sustainable behaviour, Onel et al. (2018, p. 752) distinguished three consumer archetypes with different sustainable consumption strategies:

- holistic sustainable consumers,
- occasional sustainable consumers and
- partial sustainable consumers.

Lubowiecki-Vikuk et al. (2021, p. 96) note that the emerging patterns of consumer behaviour and sustainable lifestyles found in the literature clearly show that, despite their many different names, represent cohesive concepts. Above all, they indicate that consumer behaviour is oriented towards post-materialistic values. Osikominu and Bocken (2020), nevertheless, find that most persons who adopt sustainability-oriented lifestyles live in developed countries (e.g., Western societies) and belong to middle class (e.g., have met their basic needs and are often well educated). They also note that, beyond the constitutive basis of voluntary reduction of income and consumption to gain more free time, there is no common agreement on their characteristics.

Some lifestyles strongly emphasize care for the environment, well-being and health, and active leisure time. A low-carbon and smart lifestyle is also very pronounced. Among the advocates of sustainable lifestyles, especially sufficiency approach, there is a consensus that such a lifestyle can lead to the well-being and satisfaction of users. Within a sustainable sufficiency framework Lamberton notes that “the decision criterion is the achievement of ecological, social and economic objectives concurrently; that is, action taken must be consistent with achieving sustainable sufficiency in a holistic context.” (Lamberton, 2005, p. 61). Such an approach suggests that the concept of sufficiency is closely related to the paradigm of de-growth. If sufficiency is widely adopted, we can expect it to affect economic growth, as it involves a lower level of consumption.

When assessing the impact of two lifestyles on achieving the goals of reducing greenhouse gas emissions by 2030 and 2050 mainly the following two approaches can be compared (Vita et al., 2019, p. 7).

- Green consumption is the practice of using environmentally friendly products that do not pose a risk to human health and do not threaten the operation and diversity of natural ecosystems.
- Sufficiency focuses on the behaviour of consumers and users with the goal of reducing the absolute consumption of resources and energy.

Vita et al. (2019, p. 7) used the time series back-calculation method for the analysis. They hypothesized that reducing the ecological footprint (carbon footprint, impact on water, air, soil, toxicity to organisms) can be achieved through a widely accepted way of

living a sustainable lifestyle. The research analyses in great detail various areas such as transport, food, construction and lifestyle. In the context of real estate, we are particularly interested in the field of construction and the residential real estate along with mobility, which can affect the choice of location and use of real estate.

In the field of the building sector, the most interesting approach is co-housing and reducing the size of the living space. The trend can result in a smaller volume of construction work, which can have the effect of reducing the carbon footprint and reducing the impact on land. On the other hand, the increased scope of working from home can have the opposite effect, as it increases the need for additional space and the use of energy at home. Sustainable housing patterns have a positive impact especially within the EU (for example, on local electricity production and other local energy sources) (Vita et al., 2019, p. 20).

Although construction is not directly related to the choice of lifestyle, it can have a significant impact on emissions. According to Eurostat (2020) data, as many as 70% of Europeans own their own residential property, which substantially affects energy efficiency in the building sector and the use of building materials. Another important trend that could have a significant impact is the intensification of maintenance and renovation work on real estate. This could increase the impact on land by 11% and slightly reduce other impacts (for instance emissions). Among the construction activities, the impact of energy renovations is particularly important, which could have a significant impact on reducing energy consumption, but due to the improved quality of indoor environment and lower energy costs, could have a negative impact on decisions regarding the reduction of living space. According to the authors' calculations, increasing the use of natural materials such as wood, clay and similar materials has a very small positive impact on the carbon footprint and a negative impact on land use. Similar to decisions regarding the use of natural or artificial materials in clothing, in the construction industry, the choice of materials does not have a decisive impact on any of the discussed areas of the ecological footprint. The authors note that only the sufficiency scenarios have a significant mitigation impact on the construction (Vita et al., 2019, p. 17).

For comparison, let's consider the impact of the mobility patterns. Replacing all local ground transportation with walking and

cycling could reduce carbon footprint of residents by 26% and toxicity by 14%. As an alternative, working from home includes flexible working hours and a smaller volume of daily migration to and from work, which could reduce the carbon footprint by 13% and toxicity by 7%. Movement mainly within the community also includes a lower intensity of impacts. An extended periods of time spent in the local environment mean that the range of some local services, which will have to be reachable on foot or by bicycle, is also likely to increase. Such an approach may decrease the environmental footprint for a few percent (Vita et al., 2019, p. 17).

At least half of the food and textiles consumed in the EU have footprints outside its borders. Changing dietary habits and textile purchases would relieve impacts on land and water resources in producing countries, which are typically more climate-vulnerable. Reducing the consumption of meat and clothing also benefits Europeans, as it limits the domestic carbon footprint and toxicity due to a smaller scale of processing, packaging and delivery. At the societal level, reducing pollution and noise levels has a positive impact on public health. Individuals who walk or cycle daily (i.e., are physically active) and eat more fruits and vegetables (affected by adapted changed diet) also have a positive effect on the health status of the general population (Vita et al., 2019, p. 32).

Similar to the USA (Song et al., 2019, p. 5), the EU also imports a significant share of devices and electronics, which has a strong impact on the conditions in the exporting countries. Sufficiency approach could inhibit economic growth and employment, so the transition would need to be mitigated with certain measures.

Although some green consumption scenarios bring reductions in emissions and other impacts, they usually pose the potential risk of increasing impacts on land and water. This happens in particular when replacing carbon-intensive goods with renewable fuels, materials and products that involve intensive use of land and water. The sufficiency approach has larger mitigation potential in the areas of transport, services and clothing, while green consumption shows a more significant impacts in the areas of food and industrial products. A combined large-scale transition to a plant-based diet, reduction of motorized traffic and energy-efficient dwellings enable the largest reduction of European environmental impacts (Wynes in Nicholas, 2017, p. 3). Reducing the volume of manufactured products and clothing has considerable

potential, but the effect will only be achieved through a combination of measures in all areas of life. For instance:

- A shift to local services, intra-community services and mutual aid could mitigate 3-23% of Europe's environmental impacts.
- Reducing the need for car transport, increased scope of working from home and switching to cycling and walking are options that do not require major trade-offs and could mitigate 9-26% of carbon emissions and 2-4% of land and water impacts.
- Switching to a plant-based diet can mitigate between 4 and 15% of total impacts, while reducing food waste and surpluses could reduce 2-5% of carbon emissions and save up to 16% of water.
- The use of natural textile fibres has negligible effects, but increased durability of clothing (for instance through replacement and repairs) could contribute to a 2% reduction in European impacts.
- Similarly, sharing and repairing household appliances and devices could result in a 2.5-6% reduction in total impacts.
- The impacts of alternative forms of housing depend on use of energy sources. If, for example, the current needs for heating and cooking would be covered with biomass, carbon emissions would be reduced by 8%, but at the expense of doubling the use for land (Vita et al., 2019, p. 17).

Even though the sufficiency scenario is generally more efficient and less risky, it is not as attractive as green consumption due to its contrast with the dominant paradigm of economic growth. As expected, all sufficiency scenarios result in a reduction of the environmental footprint. On the other hand, green consumption scenarios redirect expenditure towards goods that consumers perceive as more “environmentally friendly” based on their (perceived) lower carbon emissions. As the studies show, the sufficiency scenarios have the greatest mitigation potential, but they also challenge to the growth paradigm, which affects the reduction of GDP.

4. Policies and sufficiency

In the recent years, several studies of energy scenarios have been carried out, the aim of which is to indicate appropriate energy policies. These studies examine the changes needed to achieve

a sustainable energy system, security and affordability. Regarding energy scenarios and lifestyle change, Samadi et al. (2017, p. 128) consider that, in addition to other options, sufficiency-based scenarios should be taken into account. In addition, they note that the current energy scenarios do not adequately take into account the sufficiency approach and neglect its potential. The authors consider that behavioural patterns that move in the direction of an energy-sufficient lifestyle have substantial potential, as they contribute to policy goals and may even be indispensable for achieving some of the outlined goals. This potential should therefore be reflected in energy scenario studies. The authors analysed the role of energy-sufficient lifestyles in key studies of global energy scenarios and concluded that these studies largely neglected the potential of possible behavioural changes towards an energy-sufficient lifestyle. The authors suggest considering lifestyle change in energy scenarios as both necessary and beneficial.

Regarding the consideration of behaviour change towards an energy-sufficient lifestyle, Samadi et al. (2017, p. 127) defined two levers, which strongly relate to energy performance. On the one hand, the purchase, rental and investment phases are important. During these phases, the sufficiency approach aims to reduce the scope and size of the equipment or encourages the sharing of goods. On the other hand, reductions are possible in the application phase; for example, with the aim of reducing the frequency or length of journeys or lowering the heating temperature in the property. Regarding energy scenarios, sufficiency can be categorized according to the drivers that promote its implementation. Sufficiency in the context of energy-intensive goods and services can be achieved by:

- changing individual preferences (influence on lifestyle),
- change in relative prices (taxation),
- binding prohibitions or restrictions (legislation).

Furthermore, the authors (Samadi et al., 2017, p. 129) note that most of the energy scenarios envisage ambitious reductions in carbon dioxide emissions, but the measures are primarily technological and do not envisage major lifestyle changes. The only foreseen changes in consumer behaviour are foreseen in the area of mobility (a greater share of rail and bus transport, cycling, walking, fewer car journeys and flights). Since the changed mode of travel includes significantly changed behavioural patterns, the au-

thors believe that such predictions could be characterized as sufficiency lifestyle.

A strong driving factor is also regulative framework, for instance the proposal for an enhanced EU Construction product regulation, introducing several new requirements linked to carbon footprint of the construction products (COM 144 final, 2022). According to some authors (Vita et al., 2019, p. 17), it would be necessary to introduce certain measures to prevent a reverse effect. A traditional measure is e.g., price increases or the introduction of taxes to regulate the prices of energy services. Companies are also increasingly responding to sustainability challenges. For example, a study by Arslan et al. (2021) explores the link between climate change, consumer lifestyles and corporate sustainability strategies. Drivers for the adoption of sustainable strategies and practices come from different directions. On the one hand, it is necessary to take into account the institutions and coordinate the operation with new regulations and other adjustment efforts. On the other hand, decision-making is increasingly influenced by individuals within companies and their customers. Key stakeholders such as customers are also increasingly concerned about the carbon footprint of companies and expect them to find solutions to mitigate climate change (Randrianasolo, 2020).

The changes and the connection between lifestyle, consumption culture and identity are particularly visible in the western developed economies. In his study, Howell (2013) notes that in these economies, the attitude toward consumption is transforming from a means to satisfy a need to a factor that reflects self-identity. A growing number of consumers are searching for a new identity by focusing on specific consumer choices and patterns. For example, many consumers are willing to pay more for products that have been produced in a more environmentally friendly way. This further means that consumers define the way of production to a certain extent by forcing companies to adopt more sustainable practices (Arslan et al., 2021, p. 3). As consumers, especially in developed countries, become increasingly aware of the importance of their choices and the resulting environmental impacts, the development of climate change mitigation technologies is closely linked to consumer lifestyles. In fact, changing consumer lifestyles are very important and effective in reducing the carbon footprint (Stern and Wolske, 2017). Despite the fact that

sustainable lifestyles are increasingly important and more recognizable in the strategies and practices of companies, other practical aspects of successful business in a highly competitive market are also important for companies. Establishing legitimacy in a way that embraces and grounds different approaches thus emerges as a connecting factor between changing consumer behaviour and corporate practices (Arslan et al., 2021, p. 8).

5. Conclusion

Climate change will inevitably affect lifestyles and quality of life. Already today, we notice that due to e.g., heat waves conditions in buildings are worsening. At the same time, we notice that the residents are changing the behavioural patterns in response to environmental influences. This means that adaptation processes are already underway. At the same time, it is becoming increasingly clear that significant changes in the approach to individual groups of users will be necessary in specific areas. For instance, the results of the research shows that socio-cultural barriers in the field of the built environment persist. Pressing issues are above all insufficient information about the effects of climate change, unmindful attitude towards the built environment and large complexity of organized energy renovation. The review shows that it is mainly the ageing part of population who is uninformed and that it would be prudent to direct the campaigns to them, since they are the owners of the real estate in a significant proportion. As reasons for renovations, it would be reasonable to emphasize positive financial effects and aspects related to health and living comfort. Therefore, it is necessary to strengthen awareness campaigns on the impact of climate change on the environment and society and introduction of mitigation strategies, as well as to present the adaptation approaches.

It is clear that the COVID-19 pandemic has also provided an opportunity to reflect on what is important in life and to change the consumption patterns. This emergency has significantly transformed the attitude of consumers and exposed essential elements in the lives of individuals; many consumers began to give priority to the quality of life, while consumption focused primarily on goods that are essential and not merely desirable. Many people also find that they can get by with what they already have.

5.1 Household consumption

The household consumption is a significant contributor to greenhouse gas emissions and a key driver of the global economy. It is important to emphasize, that household consumption and thus carbon footprint are directly related to household income. Furthermore, emissions from certain consumption categories of the top income households, like services and goods related to leisure, are significantly higher than of the lower income households. This suggests the reasons why most studies address the emission-intensive expenditure of households in developed Western economies and high-carbon consumer groups, which are also most prominent policies targets.

With regard to new housing patterns, the most promising models are co-housing and downsizing, which can substantially reduce the consumption and the impact of emissions. However, the review shows that potential of sufficiency approach in the current energy scenarios is not well enough exploited; most of the energy scenarios envisage ambitious reductions in carbon dioxide emissions, but the measures are primarily technological and do not envisage major lifestyle changes. Another important issue is construction itself. Although not directly related to lifestyle, it can have a significant impact on emissions, especially linked to energy related approaches and the use of building materials. Such impact is well noticeable in the EU, where a large share of population possesses residential property.

5.2 Lifestyles

The review shows that the sustainable lifestyle is emerging as an important research area, however, currently the number of studies considering this question is very limited. Sustainability oriented lifestyles carry many different names and have various rates of environmental impacts but at the same time present a cohesive concept. The driver is growing awareness of climate change in the general public, especially in the group of millennials and post-millennials, predominantly in the Western societies. Other geographical regions are insufficiently covered and therefore cannot be treated separately.

Sustainable lifestyles focus on changing the perception of consumption as a status symbol of equivalent for well-being Lifestyles

that incorporate simplicity and downsizing (which also includes the sufficiency approach) replace the accumulation of material possessions with non-material goals such as spirituality, meaningful work, and nurturing relationships. Such a lifestyle is adopted by free choice and not imposed due to poverty, and moves away from consumerism. However, research gaps emerge when exploring how well the technical, economic, social and behavioural patterns are considered among various population groups, especially in conjunction with dwellings. This applies both to groups within the considered population and also (as mentioned above) for various geographical regions. This means that in the future the role of identity and consumption culture as central principles of lifestyle factors need to be taken into account, both in research and policy making.

5.3 Policies

Drivers for the adoption of sustainable strategies can be divided into top-down and bottom up. A strong driving factor are above all international agreements and regulative framework. The goal to reduce the growth and with it the increasing consumption (not only in the developed but also in the emerging economies with substantial population growth) is a task that very few policies directly address yet. Before this happens on a wider scale, not only an economical, but also social agreement will be needed.

On the other hand, incentives are increasingly coming from individuals within companies and their customers. Awareness of the impact of everyday individual actions on the environment and well-being in connection with informed decisions is therefore crucial for a changed lifestyle. Legislation and financial policies which already indicate measures related to, for example, the taxation of energy products, greener transport and the quality of the building envelope, will also contribute to faster adjustments. At the same time, it is also necessary to emphasize the financial consequences of such a transformation, not only in the sense of switching to, for example, new energy sources, but also of changes in the economical paradigm (e.g., de-growth) and structure of jobs. Above all, the countries or parts of the population that do not have enough financial assets and that will not be able to compensate this transition from their own resources will be most affected.

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