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Fundamental decarbonisation
through sufficiency by lifestyle changes

Policy brief on sufficiency as a lifestyle change contributing to decarbonisation

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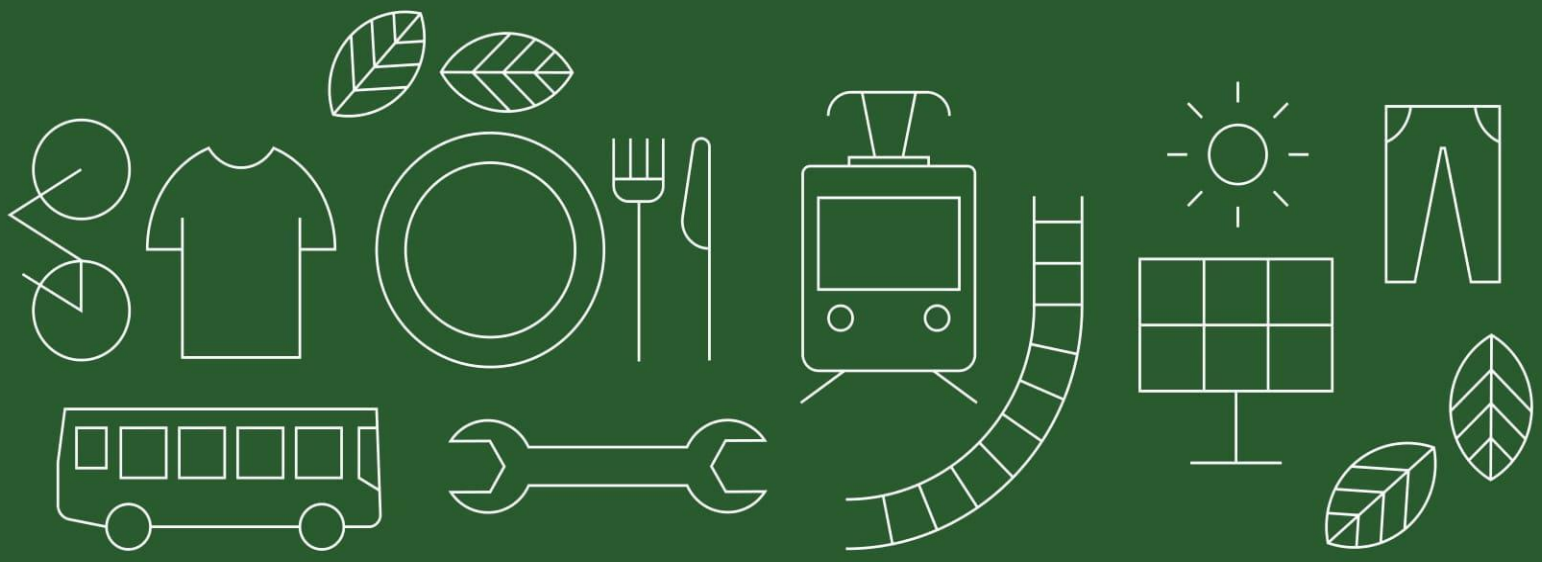
Unlocking sufficiency at the EU, National and Local Level:

A policy brief from the FULFILL Project

FULFILL
Fundamental decarbonisation
through sufficiency by lifestyle changes

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Wuppertal Institut

Research conducted in 5 EU countries + India

>21000 citizens surveyed

50 sufficiency citizen initiatives studied

160 interviews conducted

3 citizen science workshops carried out

Input-output models used to quantify effects of sufficiency measures

>30 project publications

16 sufficiency policies analysed

4 countries' NECPs analysed

⬡ Executive summary

Sufficiency promotes a holistic approach to achieving low-carbon, high-wellbeing lifestyles through implementing supportive infrastructures, regulation and policies. **It has the potential to offer numerous economic, social, health, and environmental benefits, making the EU's climate goals more attainable and cost-effective while reducing dependency on fossil fuel imports and resource shortages.** By avoiding unnecessary infrastructure investments and lowering energy system costs, sufficiency can create healthier diets, active lifestyles, reduced pollution, attractive urban spaces, improved well-being, reduced loneliness, and stronger community bonds.

This policy brief outlines key recommendations from the FULFILL project, a three-year, EU-funded Horizon 2020 research project to foster sufficiency at EU, national, and local levels.

⬡ Key Recommendations

- **Official Recognition and Integration**
  - Recognize the importance of sufficiency-oriented societal change alongside energy efficiency and renewable energy.
  - Integrate sufficiency systematically in sectoral scenarios, statistics, and wealth indicators to facilitate informed policymaking.
- **Promote Dietary Shifts towards Less Animal Products**
  - Support shifts to less meat-based diets through agricultural legislation, pricing structures reflecting environmental and health costs, promoting plant-based meals in public canteens and improving dietary education.
- **Taxation and Investment Policies**
  - Reorient taxation and investment programs to discourage carbon-intensive behaviors and promote sufficiency.
  - Examplary high impact measures include the implementation of levies on aviation (e.g. frequent flyers), heavy vehicles such as SUVs, and other high-carbon luxury items, and the introduction of a kerosene tax at the European level, also for aviation.
- **Supportive Infrastructures and Services**
  - Prioritize infrastructures and services that make low-carbon, high-wellbeing behaviour easy, attractive and accessible to all, turning the sufficient choice into the default option. This includes promoting public transport, biking, micro cars, digital sharing tools, and urban planning for cities of short distances.
- **Trans-European Mobility Programs**
  - Enhance and interconnect high-speed and night train networks and suppress flight routes where train alternatives exist.
- **Optimizing Urban Spaces**
  - Promote better use of existing buildings and prevent urban sprawl through policies encouraging modularity and space sharing.
- **Public Participation and Educational Campaigns**
  - Involve citizens and diverse stakeholders in policymaking processes to ensure acceptance and transparency.
  - Launch narratives and informational campaigns to encourage sustainable lifestyles.
- **Local Sufficiency Initiatives**
  - Support local sufficiency initiatives through financial aid, training, infrastructure adaptation, formal support, political legitimation.

By implementing these recommendations, the EU can create a supportive framework that enables sustainable lifestyle changes, reduces energy demand and greenhouse gas emissions, and enhances societal well-being within planetary boundaries. This will also make it easier to achieve climate goals.

The concept of sufficiency promotes **economic, social, health, and environmental benefits** (1) by advocating for **low-carbon, high-wellbeing lifestyles.** By using resources prudently, sufficiency has the potential to render the EU climate goals more achievable and cost-effective and reduces dependency on imports and resource shortages. Sufficiency further avoids unnecessary infrastructure investments and can lower energy system costs.[1] Other potential benefits include healthier diets, active lifestyles, reduced pollution, more attractive urban spaces, improved mental and physical well-being, reduced loneliness and increased sense of belonging and community.[2]

> **FULFILL understands the sufficiency principle as creating the social, infrastructural, and regulatory conditions for changing individual and collective lifestyles in a way that reduces energy demand and greenhouse gas emissions to an extent that they remain within planetary boundaries, and simultaneously contributes to societal well-being.[3]**

This definition assumes that the actions and choices of individuals are shaped by infrastructures, institutions, social norms and resource availability.[4] (2) Consequently, to enable sustainable lifestyle changes, **supportive social structures, enabling infrastructures, and regulatory frameworks that foster sufficiency are needed**. This policy brief includes recommendations for such enabling factors based on the FULFILL project. (3)

In the current framework of unsustainable growth ingrained within our societal systems[5], energy wastage is structurally encouraged across different contexts.[6] To illustrate, rail travel remains more expensive than air travel for many journeys, city infrastructures often favour cars over other forms of transport and plant-based options are less readily available than meat-based meals in public canteens. Besides these factors incentivizing high-carbon behaviour, many people lack options for transitioning away from carbon-intensive practices, such as relying on diesel or petrol vehicles for work and daily life in the absence of attractive and affordable public transport. This calls for **revising current regulation and infrastructure to harness the full potential of sufficiency by rendering low-carbon behaviour attractive and accessible to all.** (4)

(1) The FULFILL citizen workshops, as well as the comparative analysis of 16 sufficiency policies in 5 EU countries and further analyses on upscaling sufficiency lifestyles investigate these benefits in more detail. They further suggest that messages focusing on multiple benefits (e.g. health, social and economic benefits) can lead to increased motivation to adopt sufficiency habits in individuals and facilitate the introduction of sufficiency regulation and infrastructures.

(2) The FULFILL literature review and the investigation of sufficiency lifestyles and initiatives as well as the analysis of sufficiency policies show how collective and structural factors shape individual consumption behaviours.

(3) FULFILL highlights the need to target supply-side stakeholders beyond individuals with sufficiency policies (such as car manufacturers, agrobusinesses, and real estate developers) as they significantly influence market dynamics and consumer choices.

(4) The in-depth analysis of sufficiency lifestyles and the citizen science workshops confirm that within current structures, sufficiency lifestyles are unaffordable for many people as they are not the default option but require time and financial resources.

Quantitative research conducted around the carbon footprint calculator further shows that achieving low-carbon lifestyles without the necessary resources is possible. While it is a fulfilling lifestyle for some, for others it implies low levels of well-being and is not a chosen lifestyle but stems from deprivation, which is not sufficiency; sufficiency aims at high-wellbeing, low-carbon lifestyles.

Sufficiency + Efficiency + Renewables (5)

Current decarbonization strategies focused on efficiency improvements and renewable energy deployment, although essential, are insufficient on their own. Globally, total energy consumption and fossil fuel use continue to grow despite technological progress resulting in newly deployed renewable energy being added to the mix instead of replacing fossil fuel sources.[7] To illustrate, the trend towards heavier and bigger cars largely cancels out the efficiency gains of vehicles to a point that SUVs were responsible for over 20% of the growth in global energy-related CO_2 emissions in 2023.[8] Consequently, efficiency alone is not enough, we also need sufficiency to promote lighter and smaller cars, or even better, other forms of transport that are less polluting such as biking or trains. (6) **While per capita carbon emissions and resource consumption in Europe are unsustainable on average, they are highly unequally distributed. (7)**

Income and carbon emissions are highly correlated, with the richest countries and individuals across countries responsible for most carbon emissions.[10] Meanwhile, many people still struggle to meet their basic energy needs. In Europe, around 42 million people were unable to keep their homes adequately warm in 2022.[11] (8) **Sufficiency has the potential to address these dual challenges by aiming for well-being for all within planetary boundaries.**

Engaged citizens support sufficiency policy (9)

Evidence from citizen assemblies across Europe demonstrates robust public support for sufficiency measures. A comparison between citizen assemblies' recommendations and National Energy and Climate Plans (NECPs) shows citizens propose a significantly higher proportion of sufficiency policies (three to six times more) compared to policy makers in the NECPs.[12] This strong endorsement underscores the public's willingness to adopt sufficiency once they understand its benefits and practical implications as has been confirmed by the citizen science workshops conducted in FULFILL.[13]

ENGAGED CITIZENS
SUPPORT SUFFICIENCY

(5) The latest IPCC report recognises the importance of behavioural change to reach the climate goals as does the International Energy Agency.

(6) FULFILL proposes that since 80% of individuals buy cars on the secondary market[9], car sizing policies should focus on companies. The analysis of sufficiency assumptions shows that smaller cars also lead to less pollution, less lethal traffic accidents, less degradation of road infrastructures, reduced energy consumption, reduced raw material consumption, more road space for active modes (including less space needed for parking), and lower costs.

(7) Global adoption of the average European lifestyle would require three planets.

(8) The FULFILL literature review as well as the policy brief on the international dimension dive deeper into sufficiency's potential to reduce carbon inequalities around the globe. The empirical work in India highlights these difference.

(9) The citizen science workshops have confirmed previous research that acceptance of climate policies is enhanced if it is perceived to be socially just.

Citizen surveys reveal that unprepared publics tend to react negatively to policy measures strongly enforcing sufficiency which points to the need for societal debates prior to the implementation of such policies. This is also underlined by our work: support increases with increased familiarity.

I. EU Level: What can the EU do?

The FULFILL project has investigated policy options for sufficiency. Main barriers, opportunities, and citizen preferences have been studied throughout the project. Specific policy case studies in housing, food, and mobility have helped sketch recommendations that would facilitate the uptake of sufficiency habits. Most of these policy ideas relate to the local or national level, although at EU level some decisions could also play a key framing role. Many of them take up the idea of reshaping societal and built structures in a way that enables and supports sufficiency lifestyles instead of unsustainable ways of living. (10)

Acknowledge the relevance and benefits of sufficiency-oriented societal change

- The EU should officially recognize the importance of sufficiency-oriented societal change alongside energy efficiency and renewable energy. This could be done through a framework legislation or communication that emphasizes the role of supporting policies and infrastructures in promoting sustainable lifestyles. Such an acknowledgment would align with research from the IPCC.[14]
- In order to achieve a 90% cut in greenhouse gases by 2040, the EU has studied several options and published an impact assessment in 2024. The scenario including societal and lifestyle changes (so-called "*LIFE*") meets the target with the least need to rely on costly and uncertain carbon removal technologies,[15] sending a strong signal to support sufficiency policies.

Integrate sufficiency systematically in sectoral scenarios, statistics, and wealth indicators (11)

- The EU should systematically include sufficiency in its sectoral scenarios, statistics, and wealth indicators. This integration would address current data gaps and ease policymaking, by facilitating more detailed assessments and informed decisions. Institutionalising sufficiency would not only ease policymaking on the continent, but also send signals for global justice to the rest of the world.

Reorient taxation and investment policies to support sustainable lifestyles (12)

- Revise taxation and investment programs to discourage carbon-intensive behaviors and promote more sufficient ones. This could involve setting overall values and orientations at the EU level and providing guidelines for social compensation. To ensure effective implementation, the European Commission (EC) should monitor these efforts, potentially through mechanisms such as Social Climate Plans or NECPs. Additionally, the EC could establish a taxonomy or nomenclature to clearly list eligible activities that align with sufficiency promotion goals.
- Implementing levies on aviation, e.g. frequent flyers (13), SUVs, and other high-carbon luxury items can help reduce emissions in critical areas like aviation and road travel.

- The introduction of a kerosene tax at the European level, also on aviation, through the revision of the Energy Taxation Directive (ETD) could help European governments generate revenues that could be invested for sufficiency infrastructures. Across Europe, the aviation tax gap represents a huge shortfall in public revenues: it is estimated that it would add up to revenues of €34.2 billion in 2022 and is set to increase to €47.1 billion in 2025.[16]
- The revision of the ETD is needed to discourage carbon-intensive energy carriers and promote decarbonized electrification. This revision could help European governments generate revenues by increasing the costs of carbon-intensive energy sources, which can then be used to fund sufficiency infrastructure by allocating a minimum percentage of these funds towards promoting sufficiency.

○ **Prioritize technologies, infrastructures and services that support sufficiency** (14)

- Place technologies and services that promote sufficiency at the forefront of industrial programs and financial incentives. Especially new technologies should promote sufficiency by default.
- This includes supporting bicycle usage, public transport, micro cars, digital tools for sharing, repairing services, and meat alternatives.[17] Enhancing these areas will make it easier for households to adopt sustainable practices.

○ **Strengthen trans-European mobility programs** (15)

- Enhance and interconnect high-speed and night train networks e.g. through a more ambitious TEN-T policy. Allowing Member States and the EU to suppress flight routes where a train alternative exists can help reduce carbon emissions from aviation.

○ **Promote better use of existing buildings and prevent urban sprawl** (16)

- Encourage policies that make better use of existing buildings and prevent urban sprawl. The next revision of the EPBD could focus on building modularity and space sharing, making it easier to adjust living areas to needs and develop communal spaces.
- Supporting the development of tiny houses where appropriate can also contribute to reducing carbon emissions.

○ **Stimulate sufficiency-oriented consumption and usage patterns through product and service regulations** (17)

- Utilize EU product and service regulations to promote more sufficiency-oriented consumption and usage patterns.
- In vehicle standards, the ESPR Regulation, and Green Public Procurement rules, provisions should target product sizing and settings by default, enhance durability and repairability, and provide clearer information to consumers about the environmental impact of their purchases. This approach has been successfully implemented in some cases and can be expanded further.

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(14) Affordability and accessibility to attractive low-carbon alternatives are major drivers of sufficiency.

FULFILL finds that citizens motivated to reduce their carbon footprint often face time and access constraints to engage in more sufficient behaviour (see also the reports on the citizen science workshops and on citizens' everyday experiences).

(15) The French example examined in FULFILL highlights the potential benefits of such policies.

(16) Tiny houses, which have been looked at in FULFILL, respond to a growing aspiration and could deserve special attention as a significant lifestyle choice to reduce carbon emissions.

FULFILL also investigated legislation that can facilitate sharing appliances such as washing machines.

(17) Policies targeting smaller and lighter vehicles as well as their multiple benefits have been studied in FULFILL's report on quantified sufficiency assumptions for decarbonisation pathways.

II. National Level: What can national policy makers do?

EU Member States have varied institutional, societal, and cultural systems, as well as different starting points in terms of sufficiency comprehension. This has been investigated in FULFILL to better identify possible policy priorities. In addition to 16 national measures case studied in the project, other policies also have the potential to support less carbon-intensive lifestyles, some immediate and others more structural in the longer term.

FULFILL has further analysed the National Energy & Climate Policies (NECPs) of Denmark, France, Germany and Italy. Currently, the 27 EU countries' NECP drafts project a 51% reduction in greenhouse gas emissions from 1990 to 2030, falling short of the EU's 2030 target of a 55% reduction.[18] Sufficiency policies, such as the ones recommended in the following offer a viable solution to bridge this emission gap - and they are underrepresented so far.

Adopt progressive pricing structures for resource consumption (18)

- Implement progressive pricing for energy, water, and other resources to ensure equitable access while discouraging excessive use. For instance, initial consumption levels could be priced lower or even free, with costs increasing for higher usage. Several countries have long experiences in implementing such approaches, notably Italy and India.

Promote short-distance mobility and sustainable urban planning (19)

- Direct development programs towards enhancing short-distance mobility and alternatives to car and air travel. This includes creating safe bike lanes, high-quality train and public transport systems, urban planning to minimize travel distances by providing relevant services nearby, and promoting local tourism. Such measures facilitate sustainable lifestyles by making eco-friendly options more accessible and convenient.

Enhance national building policies for space optimization (20)

- Revise building policies to encourage efficient use of space and prevent urban sprawl. This can include housing tax adjustments based on floor area, support for flat-sharing and cohousing, restrictions on building vacancy, and assistance for downsizing to smaller dwellings. Examples like France's Net Zero Artificialisation ('ZAN') legislation illustrate the potential impact of such policies.
- Implement a tax on secondary residences, which often increase neighborhood rents and are occupied only a few weeks or months a year, as proposed in the FULFILL citizen workshops.

Support dietary shifts towards fewer animal products to reduce carbon footprints and improve health (21)

- Agricultural legislation should better anticipate and support a shift to less meat-based food, in accordance with national health and dietary recommendations.
- Introduce pricing structures that reflect the environmental and health costs of meat consumption and promote plant-based meals.
- Public canteens should increase their vegetarian offer and place them more advantageously to nudge customers.
- Increased education of health professionals and the general public can improve awareness of the benefits of a balanced diet less focused on animal products.
- Advertisements on high-carbon emitting goods such as red meat should be regulated.

Launch consistent narratives and informational campaigns (22)

- Develop and promote narratives and campaigns that encourage healthy and sustainable lifestyles. This includes educational programs, success story showcases, instructive labels, bonus-malus schemes.
- Regulate advertisements for high-carbon products like cheap air travel and SUVs since energy saving is contradicted by such advertising.
- Campaigns such as the French energy agency ADEME's 'un-seller' campaign can serve as models.

Design policies with public participation and fair distribution of efforts (23)

- All affected stakeholders including citizens local governments and municipalities, citizens, civil society organisations, trade unions and businesses should be included in the policy debate before the implementation of a policy. By including affected stakeholders in decision-making processes and letting them shape the design of the policies, policy acceptance increases and stakeholders are given transparency and planning security for their activities in relation to regulatory changes in the future.[19]
- Democratizing the policy making process also includes reducing the influence of certain lobby groups to ensure policies reflect the needs and priorities of the entire society. This is especially important when it comes to making decisions about the distribution of earth's limited resources.

Phase out legislation that promotes wasteful practices (24)

- Identify and eliminate laws that encourage energy and resource waste or lock-in unsustainable lifestyles. Ensuring policy consistency across all levels of government is crucial for achieving national climate targets and promoting long-term sustainability. Examples include a missing tax on kerosene or missing speed limits and urban structures that favour cars over softer forms of transport.
- For example, lowering the speed limit from 130 km/h to 110 km/h on highways can save drivers 25% on fuel, reducing overall fuel expenses by 7% while increasing travel time over 100km by only 8 minutes[20] and decreasing the risk for (fatal) accidents. [21]

(21) Amongst the measures examined in FULFILL, changing diets towards including less animal products holds the highest potential to reduce individual carbon footprints while at the same time offering various health benefits as laid out in the detailed assessment of social impacts carried out in FULFILL.
The FULFILL input-output model finds that the gradual transition to more vegetable-based diets allows to **reduce GHG emissions by 9.5%** with respect to the reference business-as-usual scenario in which the measure is not in place.

(22) Citizen surveys and citizen science workshops showed that informed publics tend to show higher levels of support for sufficiency policies.

(23) The case studies on sufficiency policies highlight the importance of stakeholder involvement and analyse the influence of lobby groups e.g.on meat consumption.

(24) FULFILL confirms the importance of policy consistency and shows that citizens who are open to act more sufficiently are often hindered by the lack of affordable alternatives (e.g. car dependency due to a lack of attractive public transport or bike lanes).

To illustrate a best practice example, the Netherlands' 100 km/h limit during the day resulted in a 16% decrease in accidents involving injuries and fatalities and is now widely accepted despite initial protests.[22]

⬡ **Implement social and work arrangements that enable sustainable lifestyles (25)**

- Create social and work policies that provide people with the time and resources to engage in sustainable and care activities ensuring gender balance.
- Carbon footprints can be reduced, and well-being improved through engagement in local sustainability initiatives (e.g repair cafes, sharing clothes, cars etc.), as well as in do-it-yourself, sharing, and care activities. However, this requires time that is not easily available to everyone under current economic conditions that separate paid work and largely unpaid care work.
- Promote working from home and flexibility in working hours where possible.
- Improve recognition for care work-socially and financially.

(25) FULFILL has qualitatively explored the option of reducing working time and its impacts on carbon emissions, yet more research would be useful in this area, notably taking into account gender inequalities.

FULFILL surveyed 64 local citizen initiatives, and made 5 in depth case study.

The FULFILL carbon footprint calculator found that women tend to have lower carbon footprints, with both more women finding themselves in energy poverty than men (≠ sufficiency) but also more women who combine a low carbon lifestyle and experience high levels of well-being (= sufficiency).

III. How can municipalities foster sufficiency at the local level?

Through 64 surveys, five workshops (online and in-person) and five in-depth case studies, FULFILL analysed citizens initiatives, which foster sufficiency in their communities, e.g. through renting out cargo-bikes, advocating for clean air or establishing co-housing projects. **Sufficiency initiatives have been shown to offer multiple benefits for individual citizens, communities and the environment** such as improving feelings of belonging and participation, fighting loneliness, providing sufficiency infrastructures on a small scale (e.g. sharing and repairing services) and spreading healthy ways of life that profit both people and planet. Yet, most sufficiency initiatives face multiple challenges that threaten their existence or hinder them from being upscaled.[23] FULFILL offers a series of policy recommendations addressing short-, medium-, and long-term perspectives to better support and protect sufficiency initiatives so that they can benefit both the environment and citizen's well-being.[24]

In the short term, municipalities can support local sufficiency initiatives through strategic niche management[25], protecting initiatives from the full force of prevailing selection pressures within unsustainable urban systems. In the medium term, the challenge lies in translating sufficiency concepts into measurable metrics and indicators essential for evidence-based policymaking. In the long term, the aim is to redirect urban system dynamics towards favouring sufficient solutions over growth-oriented approaches. This requires a comprehensive policy approach integrating price signals, infrastructure development, legal frameworks, and social norms to foster systemic change. FULFILL identified ways in which municipalities can start by offering support in four primary domains:

Resources and competences: Sufficiency initiatives rely initially partially on voluntary work and non-material and idealistic support. Cities can offer financial support and training especially in financial, administrative, and legal matters, which are usually not a core competence of local sufficiency initiatives.

Infrastructure and legal conditions: Physical infrastructures, economic and legal frameworks usually promote material and energy-intensive production and consumption patterns (e.g. roads for cars, regulations on food hygiene, expansive land-use planning). Municipalities can adapt urban transport infrastructures and sometimes have scope for developing flexible responses to sufficiency objectives in other areas such as food processing and end-of-life use, planning of the built environment or land-use.

Formal support, venues, and networking: Sufficiency initiatives are usually valuable organizations of benefit for the public and should be officially recognized and treated as such. They should have central contact persons and guidance when dealing with local administrations. Ideally, local networking and mutual learning among the initiatives also in cooperation with municipal staff could be encouraged, e.g., by offering venues, communication, and training facilities. Furthermore, municipalities can offer space and venues for meetings and public engagement, including collaborations with local housing cooperatives and neighbourhood associations.

Political legitimation and communicative support: Many sufficiency initiatives struggle to survive. A continuous challenge is the recruiting of a voluntary and active membership. During our interactions with the initiatives, they often indicated difficulties reaching the general public. In that context, they would welcome public recognition and support. Municipalities could directly inform citizens about existing initiatives in their community, but they could also be a mediator between sufficiency initiatives and potential donors. For example, they could mediate public private partnerships, networking, and association. Eventually, sufficiency initia-

tives could become partners in the planning and development of cities and towns. Sufficiency principles could be integrated in municipal strategies and planning. There is evidence that especially, the introduction of concrete targets and timetables seems to motivate cooperation, e.g., introducing carbon budgets at municipal level. Regional food cooperatives as well as repair and sharing initiatives could make valuable contributions not only to meeting climate change mitigation targets, but also to improving neighbourhoods, citizenship and social cohesion.

Best practice example: Cargo-Bike Initiative from Germany

The aim of the initiative is promoting sufficiency habits by making a sustainable alternative to motorised private transport that is suitable for everyday use visible and to give the city's residents the opportunity to try it out on a low-threshold basis. The initiative wants to show that transporting children as well as bulk shopping with cargo bikes is easy, space saving, sustainable and a lot of fun.

The municipality supported the set up and continues to support the operation of the free cargo-bike rental service with initial and follow-up financing as well by providing a platform for public relations.

Apart from funding, the city's mobility office regularly invites the initiative to events, giving it the opportunity to increase its visibility. The cargo bikes are also provided with the municipality's logo. This strengthened the citizens' trust in the rental service, especially at the beginning, when the initiative was not yet established in the city – and at the same time advertises for the city.
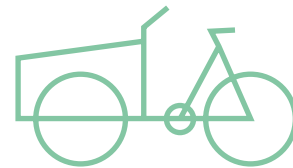
The contact between the initiative and the city administration works very well, which is mainly because the founder of the initiative now works in the mobility office of the city.

Many initiatives encounter difficulties to find a supportive contact person in the municipality, but this example shows how a good cooperation between initiatives and municipalities can elevate the initiatives success.

⬡ Conclusion and Future Research

Sufficiency should be a priority in our policy framework due to its multifaceted benefits, encompassing economic, social, health, and environmental dimensions. By advocating for low-carbon, high-wellbeing lifestyles, sufficiency supports the EU's climate goals in a more achievable and cost-effective manner, while reducing reliance on imports and mitigating resource shortages. It has the potential to avoid unnecessary infrastructure investments, lowers energy system costs, and promotes healthier diets, active lifestyles, reduced pollution, more attractive urban spaces, improved mental and physical well-being, reduced loneliness, and an increased sense of community. The FULFILL project underscores that messages highlighting these diverse benefits can facilitate the introduction of supportive regulations and infrastructures and motivate individuals to adopt sufficiency habits.

To harness the full potential of sufficiency, the FULFILL project recommends several policy measures. At the EU level, there is a need to **officially recognize the importance of sufficiency-oriented societal change alongside energy efficiency and renewables,** and to integrate sufficiency systematically in **national energy and climate plans (NECPs), sectoral scenarios, statistics, and wealth indicators. Taxation and investment policies** should be reoriented to discourage carbon-intensive behaviors and promote sufficient ones, with specific levies on aviation and high-carbon luxury items. Technologies and services that support sufficiency, such as public transport, biking, and plant-based alternatives, should be prioritized. Additionally, strengthening trans-European mobility programs, promoting better use of existing buildings, and preventing urban sprawl are essential. Finally, further research is necessary:

- Development of a **more detailed impact assessment of a sufficiency pathway**, which includes the identification of strategies that **avoid unintended consequences** such as burdens on low-income populations or to the care economy. Future research should also focus on **differentiating the impacts** more precisely, including examining gender-specific effects, and corresponding recommendations.

- **Improve modelling approaches** regarding economic effects of sufficiency pathways, which includes further developing methodologies as well as **widening the scope of conventional models** by considering dynamic economic shifts and the high costs of inactivity in mitigating climate change.

- Provide detailed **analyses of pilot projects** and best practice examples.

At the national and local levels, progressive pricing structures for resources, promoting short-distance mobility, optimizing space in building policies, supporting dietary shifts, launching educational campaigns, and involving the public in policy design are key ideas to start on sufficiency.

⬡ Endnotes

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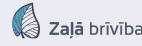
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Sufficiency: Wellbeing for all within planetary boundaries
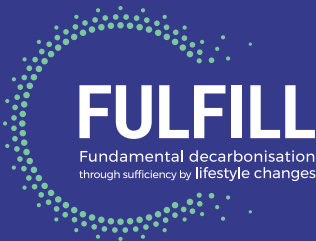
FULFILL
Fundamental decarbonisation through sufficiency by lifestyle changes

Fraunhofer ISI

Zaļā brīvība

eurac research

INFORSE-EUROPE
International Network for Sustainable Energy

POLITECNICO MILANO 1863

ASSOCIATION négaWatt

NOTRE EUROPE
Institut Jacques Delors
Thinking Europe • Penser l'Europe • Europa denken

Wuppertal Institut

Research conducted in 5 EU countries + India

>21000 citizens surveyed

50 sufficiency citizen initiatives studied

160 interviews conducted

16 sufficiency policies analysed

3 citizen science workshops carried out

Input-output models used to quantify effects of sufficiency measures

>30 project publications

4 countries' NECPs analysed

Sufficiency is about creating the social, infrastructural, and regulatory conditions for changing individual and collective lifestyles in a way that **reduces energy demand** and greenhouse gas emissions to an extent that they remain within planetary boundaries, and simultaneously contributes to **societal wellbeing**.

Sufficiency - Fulfill Sufficiency. (2024, July 22). FULFILL project website.

If everyone lived like an average European, we would need three planets to sustain us.[1]
We are overconsuming the earth and overshooting many planetary boundaries.

At the same time, consumption levels are unfairly distributed across the population, with **income and carbon emissions being highly correlated**. The richest countries but also the richest individuals across countries are responsible for most carbon emissions,[2] while at the same time, many people struggle to satisfy their basic energy needs.[3]

[1] Global Footprint Network. "EU Overshoot Day 2024." *Earth Overshoot Day*, 3 May 2024. Accessed July 23, 2024.

[2] Chancel, L., Piketty, T., Saez, E., Zucman, G., *et al. World Inequality Report 2022*. World Inequality Lab. wir2022.wid.world.
[3] European Economic and Social Committee (EESC). (2023, July 19). Energy poverty: 42 million people in the EU cannot afford to heat their homes adequately.

Sufficiency is about finding the safe space of wellbeing for all within planetary boundaries.

Curbing overconsumption, for example by reducing emissions from the biggest consumers such as major corporations, and the wealthiest households.

Guaranteeing fair access to essential services for all, such as heating, transportation, electricity, etc.

Enjoying the **multiple benefits** of sufficiency lifestyles such as better air quality, healthier diets, and more attractive cities.
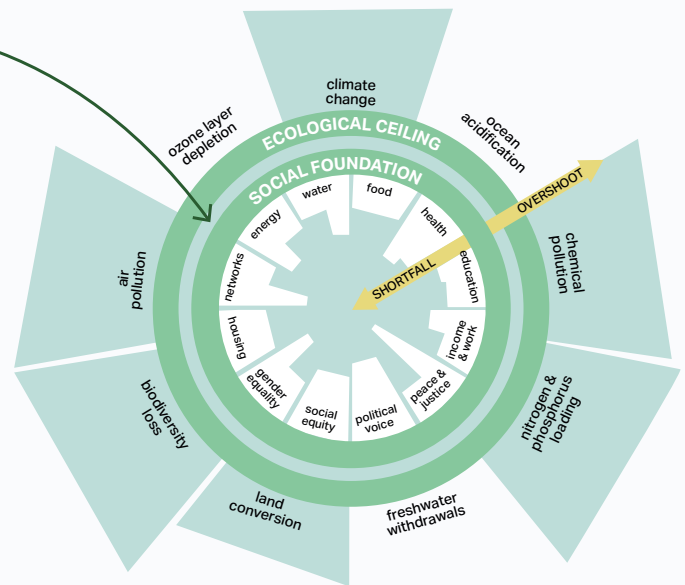

Illustration adapted from Raworth, K. (2017). 'A doughnut for the anthropocene: Humanity's Compass in the 21st Century', The Lancet Planetary Health, 1(2).

The European Union has set itself the goal to swiftly reduce emissions and become climate neutral by 2050, yet we are still far from it.

The latest IPCC report[4] recognises the **need for behavioural** change to reach the climate goals as does the International Energy Agency[5], which emphasizes that behavioural changes are most important in advanced economies. Sufficiency can make achieving the EU's climate goals more cost-effective and likely and help decrease the EU's dependence on energy imports and other critical resources.
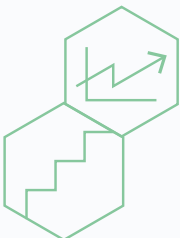
− 55% CO₂ **2030**

FIRST CLIMATE NEUTRAL CONTINENT BY 2050

European Commission. (2021). Delivering the European Green Deal.

[4] IPCC, (Intergovernmental Panel on Climate Change). 2023. "Climate Change 2023". Synthesis Report Summary for Policymakers.

[5] International Energy Agency. *Net Zero Roadmap: A Global Pathway to Keep the 1.5 °C Goal in Reach*. IEA, 2023. Accessed July 23, 2024.
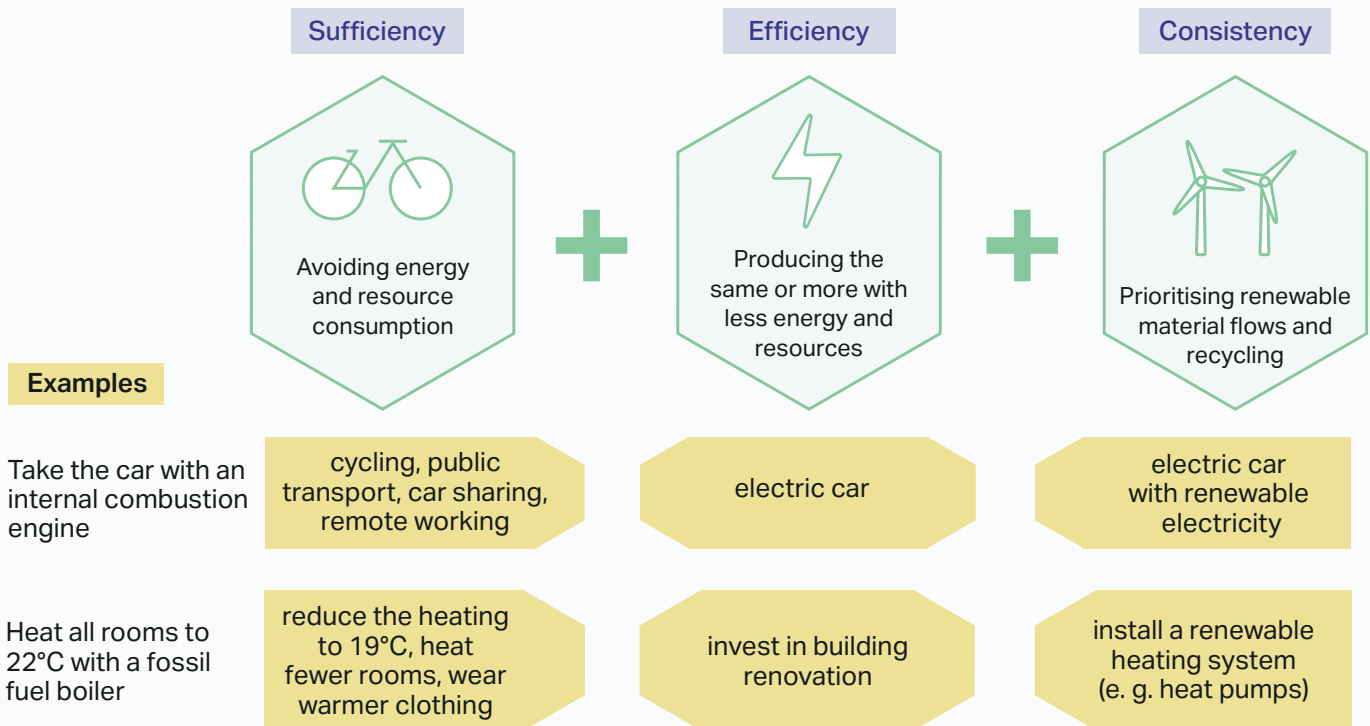
What role for sufficiency in the green transition?

According to the latest IPCC report[4] and the IEA[5], we need all three approaches to reach climate targets:

Sufficiency	Efficiency	Consistency
Avoiding energy and resource consumption	Producing the same or more with less energy and resources	Prioritising renewable material flows and recycling

Examples

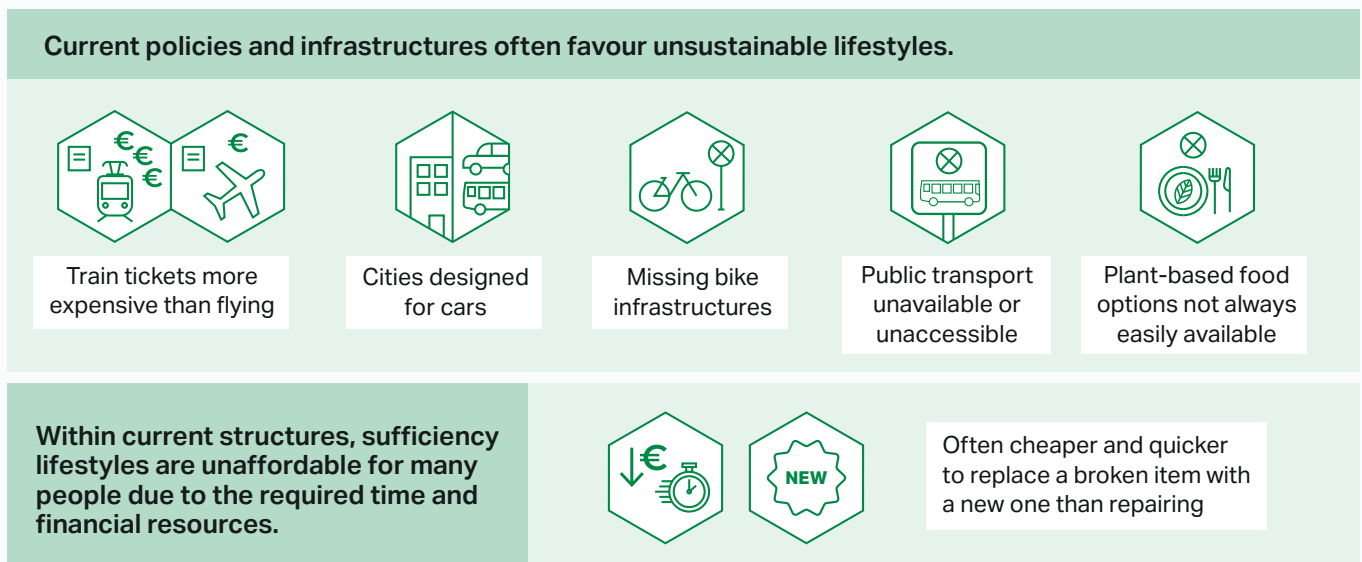|	Sufficiency	Efficiency	Consistency
Take the car with an internal combustion engine	cycling, public transport, car sharing, remote working	electric car	electric car with renewable electricity
Heat all rooms to 22°C with a fossil fuel boiler	reduce the heating to 19°C, heat fewer rooms, wear warmer clothing	invest in building renovation	install a renewable heating system (e. g. heat pumps)

Adapted from Leuser L. & Pellerin-Carlin T. 2022. "Energy Sufficiency. The missing lever to tackle the energy crisis", Policy brief, Paris: Jacques Delors Institute, 13 May.

Individuals face a range of barriers to choose a sufficient lifestyle

In European countries, around 13% live already a relatively sufficient lifestyle – low on emissions for housing, transport and diet and with high levels of well-being and free of social deprivation.[6] Their motivations include environmental values – but also a **better health, curiosity for a simpler life and social bonds** to people with similar ideas.[7] [8]

However, many people face barriers to living sufficiently, such as:[7] [9]

Current policies and infrastructures often favour unsustainable lifestyles.

Train tickets more expensive than flying	Cities designed for cars	Missing bike infrastructures	Public transport unavailable or unaccessible	Plant-based food options not always easily available

Within current structures, sufficiency lifestyles are unaffordable for many people due to the required time and financial resources.

Often cheaper and quicker to replace a broken item with a new one than repairing

Lack of education on the risks associated with high meat consumption for health professionals and individuals

There is limited awareness about sufficiency as a concept, the environmental impacts of current habits, and the benefits of a sufficiency lifestyle.

Social norms can discourage sustainable choices.

Preference of individual over shared housing

6 Alexander-Haw, A., Dütschke, E., Helferich, M., Preuß, S., & Schleich, J. (2023). Report on the first survey and identification of the sufficiency groups (Deliverable D 3.1). FULFILL Project.
7 Flipo, A., & Rabourdin, S. (2023). In-depth analysis of highly sufficient lifestyles (Deliverable D 3.2). FULFILL Project.
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9 Barbas, A., & Breucker, F. (2024). Report on citizen engagement activities (Deliverable D 7.1). FULFILL Project.

How can these barriers be overcome?

For lasting change, sufficiency cannot rely solely on individual responsibility and action but requires a societal debate and creating supportive social, infrastructural, and regulatory conditions to overcome the barriers that individuals face to implement lifestyle changes.
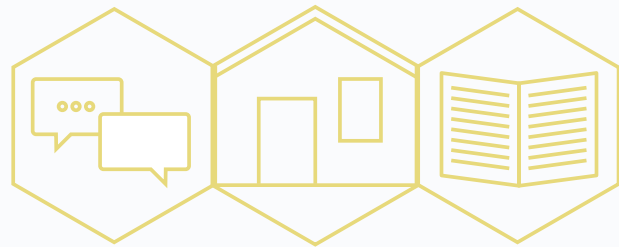
Alexander-Haw, A., Dütschke, E., Janßen, H., Schleich, J., Tröger, J., & Tschaut, M. (2024). Report on long term effects of sufficiency lifestyles and governance approaches for diffusion (Deliverable D 3.3). FULFILL Project.

Sufficiency initiatives

On a local level, sufficiency initiatives formed by citizens offer multiple benefits for their cities and for those involved.

Health benefits and education

Skills

Sense of belonging

Financial advantages

Repair cafés

Bike rental services

Car sharing clubs

Breucker, F. & Farfoglia, R. (2023). Report on vertical horizontal multilevel governance (Deliverable 4.4). FULFILL Project.
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Public support for sufficiency measures

When given the opportunity to express their views in decision making processes and learn more about sufficiency, citizens tend to support sufficiency policies.

Recommendations made by citizen assemblies contain significantly more sufficiency policies (three to six times more) than policy makers list in the National Energy and Climate Plans (NECPs).

39%

of the mitigation policies brought forward by citizens were sufficiency measures.[10]

ENGAGED CITIZENS SUPPORT SUFFICIENCY

Uninformed publics tend to prefer softer policy measures over more restrictive ones. However, acceptance can be increased through engaging citizens and informing them about sufficiency as well as designing policies in a socially just way. [11] [12]

[10] Lage, Jonas, et al. "Citizens call for sufficiency and regulation - A comparison of European citizen assemblies and National Energy and Climate Plans." Energy Research & Social Science 104 (2023): 103254.
[11] Barbas, A., & Breucker, F. (2024). Report on citizen engagement activities (Deliverable D 7.1). FULFILL Project.
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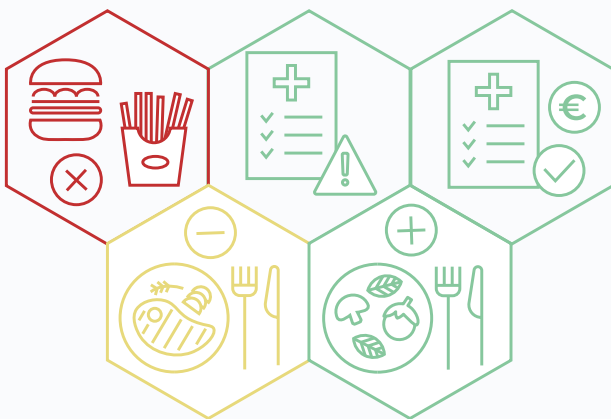
Food

Current diets are increasingly unhealthy, unsustainable, and inequitable for many people.[13] When it comes to food, sufficiency means eating healthier and more climate friendly food, for example by reducing animal products in our diets. **Changing diets has the biggest potential to reduce individual CO_2 emissions among all the policy measures studied in FULFILL.**[14]

Co-benefits

Health benefits of reduced meat consumption

Fairer prices that reflect the environmental costs of production

Increased animal welfare

Enablers[15]

Increased availability and affordability of plant-based products.

Better placement of vegetarian food in canteens.

Advertisement regulation.

Meat-free days in public and corporate canteens.

Education on health benefits of reduced meat consumption.

Food industry regulation.

[13] Fanzo, J., & Davis, C. (2019). Can Diets Be Healthy, Sustainable, and Equitable? Current Obesity Reports, 8(4), 495–503.
[14] Golinucci, N. et al., (2024). Quantitative evaluation of the macroeconomic impacts of up-scaled sufficiency action at the European level. (Deliverable D6.2). FULFILL project.
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[16] Breucker, F., & Defard, C. (2023). Report on the comparative analysis of sufficiency policies (Deliverable D5.2). FULFILL Project.

Mobility

| Biking | Flying less | Using public transport | Using smaller cars | Working from home | Car sharing |

2023

SUV's were responsible for over 20% of the growth in global energy-related CO_2 emissions.

Efficiency + Sufficiency

**Major advances in fuel efficiency and emissions are offset by the trend toward heavier, bigger cars.**

This issue is largely overlooked at the policy level. Introducing fiscal incentives for electric vehicles that consider the **weight and size** of the vehicle, in addition to CO_2 emission reductions, could help address this problem.

Cozzi, L., & Petropoulos, A. (2024, May 28). SUVs are setting new sales records each year – and so are their emissions. IEA Commentary.

Car manufacturers' profit model focuses on larger vehicles with higher prices and margins. Since **77%** of EU citizens buy used cars, car sizing policies should target companies—such as manufacturers, leasing firms, and businesses with fleets—to shape the supply side of the market.

T&E. (2023). How leasing companies can become a key driver of affordable electric cars in the EU.

Co-benefits[17]
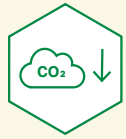
- Less lethal traffic accidents
- Less pollution
- Less degradation of road infrastructures
- More road space for active modes (including less space needed for parking)
- Reduced energy consumption
- Reduced raw material consumption[18]
- Lower costs

[17] Gabert, A. *et al.* (2024). Report on the consolidation of quantified sufficiency hypotheses in decarbonisation strategies (Deliverable D 5.3). FULFILL Project.
[18] Risk of shortage at the international level for lithium/nickel material in the context of exponential market development underlines the necessity to limit the size of electric vehicles batteries to limit raw material consumption. See: négaWatt Association. (2023). Lithium: Towards a necessary sufficiency. Briefing note, February.

Housing

1990 → 2018
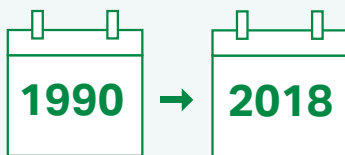
Energy efficiency gains in buildings in the EU were almost completely offset by increases in floor area per capita.[19]

At the same time, many Europeans struggle with unaffordable housing or live in overcrowded spaces.[20] Thus, sufficiency regarding living space is an indispensable lever to decarbonise the housing sector while contributing to the provision of adequate housing for all.

11-18 % feel they have more space than they need[21]

19-30% feel they have too little space

[19] EEB & OPENEXP. (2021). Sufficiency and circularity, the two overlooked decarbonisation strategies in the 'Fit For 55' package.
[20] Eurostat. (2022). Housing in Europe. Interactive edition.
[21] Alexander-Haw, A., Dütschke, E., Janßen, H., Schleich, J., Tröger, J., & Tschaut, M. (2024). Report on long term effects of sufficiency lifestyles and governance approaches for diffusion (Deliverable D 3.3). FULFILL Project.

- Co-housing
- Community living
- Sharing common areas
- Sharing appliances
- Exchanging living space

Decreasing the number of square meters per person or reducing under-occupied housing would be a way to move towards more sufficient lifestyles. Options to enable better use of space include:

developing **more shared housing options**

incentivise the **exchange of apartments** between people who have more space than they need and those who live in overcrowded places

Alexander-Haw, A., Dütschke, E., Janßen, H., Schleich, J., Tröger, J., & Tschaut, M. (2024). Report on long term effects of sufficiency lifestyles and governance approaches for diffusion (Deliverable D 3.3). FULFILL Project.
Gabert, A., Marignac, Y., Djelali, M., Dufournet, C., & Flipo, A. (2024). Integration of SSH findings in quantified sufficiency assumptions for decarbonisation pathways (Deliverable D5.3). FULFILL Project.

Co-benefits

Social aspects

Mental health

Contribute to solving the housing crisis and overcrowding

Teubler, J., Neumann, M., & Flynn, H. (2024). Report on the societal and environmental impacts of sufficiency (Deliverable D6.3). FULFILL Project.

Consumption

Reducing

Avoiding

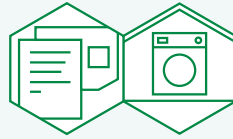Shifting away from resource intensive goods

Reusing

Repairing

Sharing

Regulation and infrastructure can enable or hinder a more sufficient approach to consumption. Examples for enabling factors include:

Legislation enforcing **common areas** in new buildings and when deep renovations are carried out e.g. for common laundry facilities

Better **repair services** for appliances

No more planned obsolescence

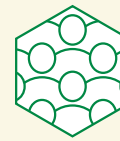**Discourage single-use disposable items** e.g. through fees

Co-benefits

Financial savings

Less resource and energy use

Social interactions

Gain of space

Gabert, A., Marignac, Y., Djelali, M., Dufournet, C., & Flipo, A. (2024). Integration of SSH findings in quantified sufficiency assumptions for decarbonisation pathways (Deliverable D5.3). FULFILL Project.

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