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# PRIORITISING EXISTING BUILDINGS FOR PEOPLE AND CLIMATE

SUFFICIENCY AS A STRATEGY TO ADDRESS THE  
HOUSING CRISIS, ACHIEVE CLIMATE & RESOURCE TARGETS  
AND REVITALISE COMMUNITIES



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# Key messages

- Existing building policies have failed to alleviate planetary pressure, inequality and housing shortages, as they rely on a narrow view of carbon and energy intensity metrics. Savings are offset by floor area growth per capita which continues to outpace population growth.
- Understood as prioritising use of the existing building stock to provide quality housing, employing sufficiency principles can significantly contribute to climate change mitigation by avoiding both embodied and operational carbon emissions.
- Preserving and making best use of the existing building stock helps address multiple crises in the EU: housing shortage, resource overconsumption, land sealing, as well as high infrastructure costs for municipalities. Implementing sufficiency opens the door to revitalise both natural systems and human communities.
- Sufficiency policies are more widely accepted among European citizens than commonly believed, and enhance well-being and combat loneliness.
- Sufficiency is a systemic approach that breaks down policy silos and fosters innovation across and within governance levels and policy fields.
- Decision-makers across all governance levels should begin to mainstream sufficiency into the existing policy framework, remove barriers for its implementation, and support research and data collection.
- At the EU level, the newly appointed Commissioner for Energy and Housing can help shift the focus toward creating new housing units through the repurposing and reuse of existing spaces. This shift offers an opportunity to redefine housing beyond energy poverty and new construction, expanding the focus to include availability, accessibility, inclusivity, and overall housing quality.



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**Sufficiency aligns with a vision that seeks to fulfil the international human right to adequate housing, viewing buildings as vital components of societal well-being. Rather than being seen merely as material possessions or tradeable assets, buildings serve to foster social cohesion, employment opportunities, access to infrastructure, safety, culture and community life.**



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# SUFFICIENCY – AN OPPORTUNITY FOR THE BUILDING SECTOR TO TACKLE MULTIPLE CRISES

Affordable housing has been established as a key priority by the recently reappointed Commission President, Ursula von der Leyen. Now is the opportune moment to align this new agenda with existing energy performance efforts for buildings and endorse sufficiency principles that can simultaneously advance multiple policy objectives. By prioritising a more efficient use of the existing building stock, we can significantly reduce carbon emissions, curb resource overconsumption, and ensure that EU citizens have access to affordable, high-quality housing in a cost- and time effective manner.

## EXISTING POLICIES SHOULD INTEGRATE SUFFICIENCY TO MAXIMISE IMPACT

Buildings are by far the largest contributors to greenhouse gas (GHG) emissions in the EU due to their extensive energy and material use. Apart from the vast input of energy and raw materials required for construction, operation and maintenance, buildings also exert substantial land use impacts. Growing awareness and evidence of the Whole Life Carbon (WLC) footprint of buildings has broadened the narrative on building decarbonisation to include the full range of emissions related to materials, energy and built space in each step of the life cycle. A more comprehensive understanding of the climate impacts of the building stock enables a more effective assessment and comparison of mitigation measures, thus facilitating more informed and effective policymaking.

The WLC perspective has also unveiled the critical and underestimated relevance of embodied emissions, which are on par with advocating for energy efficiency and renewable solutions<sup>1</sup>. Technical solutions aimed at energy performance alone may not be enough for achieving a rapid and meaningful building stock decarbonisation, even with immediate and widespread implementation of low carbon technologies. Moreover, this approach risks perpetuating the extraction of scarce raw materials and dependence on their imports as new buildings are rapidly built in response to an urgent need for new housing. Leveraging supply-side and demand-reduction measures simultaneously is needed to maintain a trajectory aligned with climate neutrality targets.

<sup>1</sup> Ramboll, BPIE, KU Leuven (2023): Supporting the Development of a Roadmap for the Reduction of Whole Life Carbon of Buildings. <https://op.europa.eu/en/publication-detail/-/publication/923706b7-8f41-11ee-8aa6-01aa75ed71a1/language-en>

**As a policy strategy, sufficiency focuses on optimising the use of existing buildings to create a built environment that is attractive, affordable, and aligned with the actual space and accessibility needs of occupants, all while respecting planetary boundaries. And there is huge untapped potential: 34% of the EU population lives in underoccupied homes<sup>2</sup>, while average office occupancy rate is around 57%<sup>3</sup>.**

Sufficiency is key lever for decarbonisation, as it reduces emissions throughout the entire lifecycle of buildings. With embodied emissions playing an increasingly critical role over the next 30 years<sup>4</sup>, this paper focuses on sufficiency measures that reduce the need for unnecessary new construction by maximising the use of existing buildings (defined as “building sufficiency”, see section below).

## OPERATIONAL VS. EMBODIED CARBON

Existing EU policies address both (1) operational emissions<sup>5</sup> and (2) embodied emissions, primarily from the supply side<sup>6</sup>. Furthermore, end-of-life policies aimed at minimising waste and increasing circularity also play a role in reducing embodied emissions<sup>7</sup>. However, the current emphasis on promoting low carbon materials, energy efficiency and shift to renewables as key strategies to curb building related GHG emissions falls short of meeting climate targets<sup>8</sup>. This is where the concept of sufficiency gains importance, as it aims to innovatively avoid demand for materials, energy, and other resources such as land and water.

<sup>2</sup> Eurostat. Housing in Europe – 2023 interactive edition ([here](#)). According to Eurostat’s definition, “a household is underoccupied if it has at its disposal more than a minimum number of rooms considered adequate: one room for the household, per couple, for each adult single person, per pair of single people of the same gender aged 12-17, for each single person aged 12-17 and not included in the previous category, and per pair of children under 12.”

<sup>3</sup> Savills (2023) Spotlight: European Office Occupancy Rates, Accessible at: [https://www.savills.com/research\\_articles/255800/353641-0](https://www.savills.com/research_articles/255800/353641-0)

<sup>4</sup> Over the next 30 years, embodied emissions will make up the majority of new buildings’ overall carbon footprint as they are released mainly before the building is even occupied. Considering the cumulative nature of emissions and the limited time available before 2050, prioritising carbon reductions in the present (embodied emissions) takes precedence over anticipating carbon savings in the future (operational carbon reductions).

<sup>5</sup> Examples of such policies are the Energy Performance of Buildings (EPBD), Energy Efficiency Directive (EED), Renewables Energy Directive (RED), Ecodesign Directive, Energy Labelling Regulation and Effort Sharing Regulation.

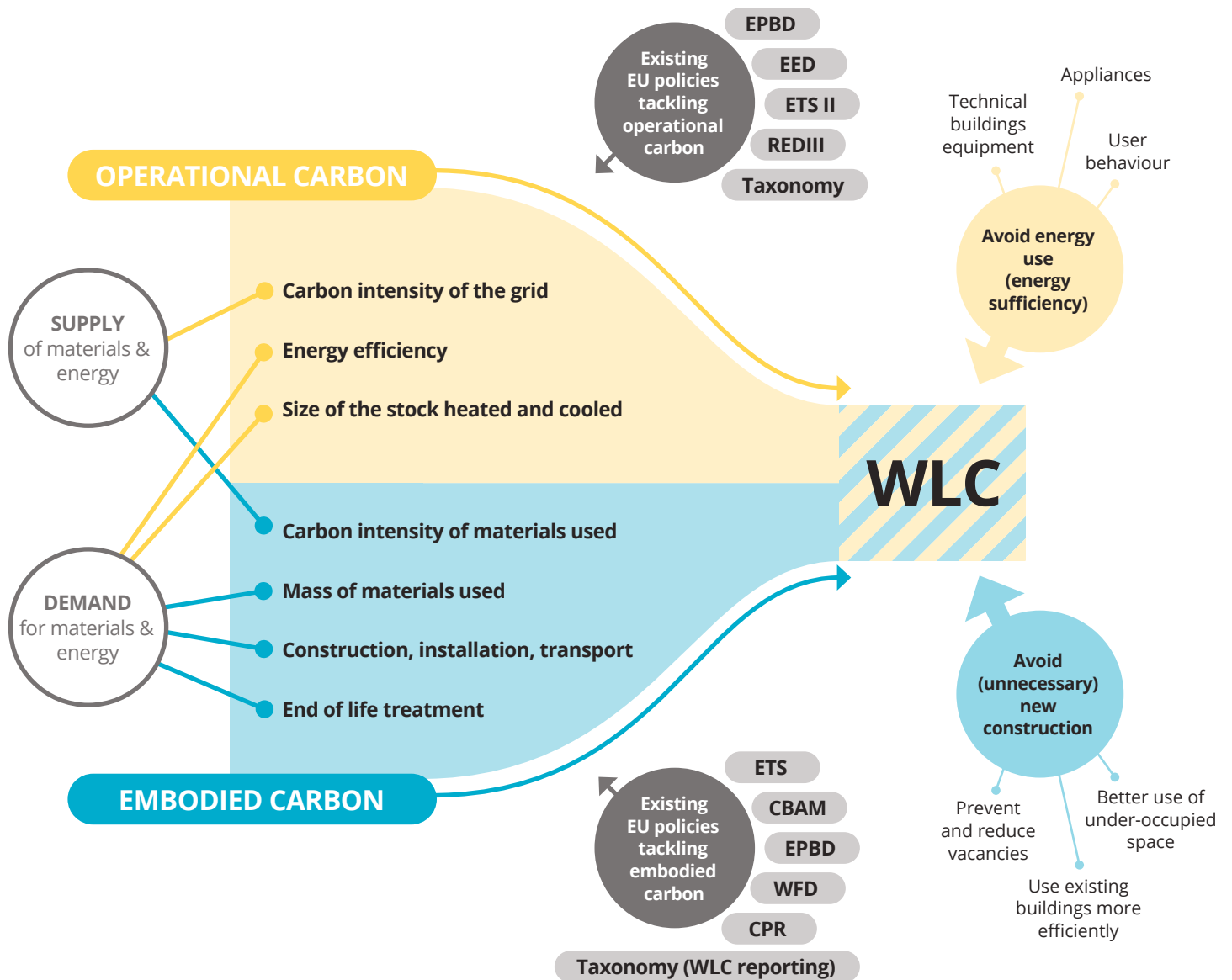
<sup>6</sup> Through ETS carbon pricing and emission cap, RED, EED, CO<sub>2</sub> emission performance standards for cars and vans, as well as industrial policies covering raw materials, intermediate products and construction products.

<sup>7</sup> Examples of such policies are the Construction Products Regulation, Ecodesign for Sustainable Products Regulation (ESPR), Emission Trading Scheme (ETS), Waste Framework Directive (WFD)

<sup>8</sup> Ramboll, BPIE, KU Leuven (2023): Supporting the Development of a Roadmap for the Reduction of Whole Life Carbon of Buildings. <https://op.europa.eu/en/publication-detail/-/publication/923706b7-8f41-11ee-8aa6-01aa75ed71a1/language-en>

**Figure 1:** Overview of the factors impacting whole life carbon emissions of the building stock, how they are addressed by current EU regulations<sup>9</sup> and how sufficiency fits among existing decarbonisation efforts.  
(Source: BPIE)

# WHOLE LIFE CARBON EMISSIONS



<sup>9</sup> Acronyms in full: EPBD: Energy Performance of Buildings Directive, EED: Energy Efficiency Directive, RED III: Renewable Energy Directive, ETS & ETS II: EU Emission Trading Scheme, ESR: Effort Sharing Regulation, CPR: Construction Product Regulation, WFD: Waste Framework Directive, Sustainable Finance: Sustainable Finance package (comprising different policy initiatives), NEB: New European Bauhaus, GPP: EU Green Public Procurement, C&DW: Construction and Demolition Waste.

The emergence of sufficiency on the policy agenda is a result of the latest climate science findings. The IPCC has recognised sufficiency as a vital and overlooked climate mitigation strategy in its latest report and has put forward the Sufficiency-Efficiency-Renewable (SER) framework, positioning sufficiency as *complementary* to existing mitigation efforts.



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**While efficiency is about doing things right,  
sufficiency is about doing the right things.<sup>10</sup>**



Efficiency is typically understood as ongoing, incremental technological improvements that enable increasingly more productive use of resources, albeit without considering the limits imposed by Earth's ecosystems. This approach is different from long-term sufficiency strategies that are rooted in non-technological approaches, such as land-use management and planning. Sufficiency strategies aim to decrease absolute consumption by aligning with the cycles and capacities of the natural world.<sup>11</sup>

The inclusion of the sufficiency definition in the Summary for Policymakers of the 2022 6th Assessment Report of the IPCC marked a turning point and growing recognition of its importance in policy discussions<sup>12</sup>. This trend is being reflected by recent high-profile buildings events such as the Buildings and Climate Global Forum<sup>13</sup> and World Circular Economy Forum.<sup>14</sup>

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<sup>10</sup> Sachs, W. (1999). Planet Dialectics: Explorations in environment and development. Zed Book Ltd., p. xix

<sup>11</sup> IPCC (2022): Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Available online at: [https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC\\_AR6\\_WGIII\\_Chapter09.pdf](https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_Chapter09.pdf), p.957f

<sup>12</sup> Further key publications include: Manifesto (2024): A Resilient and Resource-wise Europe: Sufficiency at the Heart of the EU's Future, accessible at: [https://eeb.org/wp-content/uploads/2024/03/sufficiency\\_manifesto.pdf](https://eeb.org/wp-content/uploads/2024/03/sufficiency_manifesto.pdf); IFPEB (2024): Sufficiency and the Built Environment: Reducing Demand for Land, Floor Area, Materials and Energy as the first step towards sustainable buildings, forthcoming.

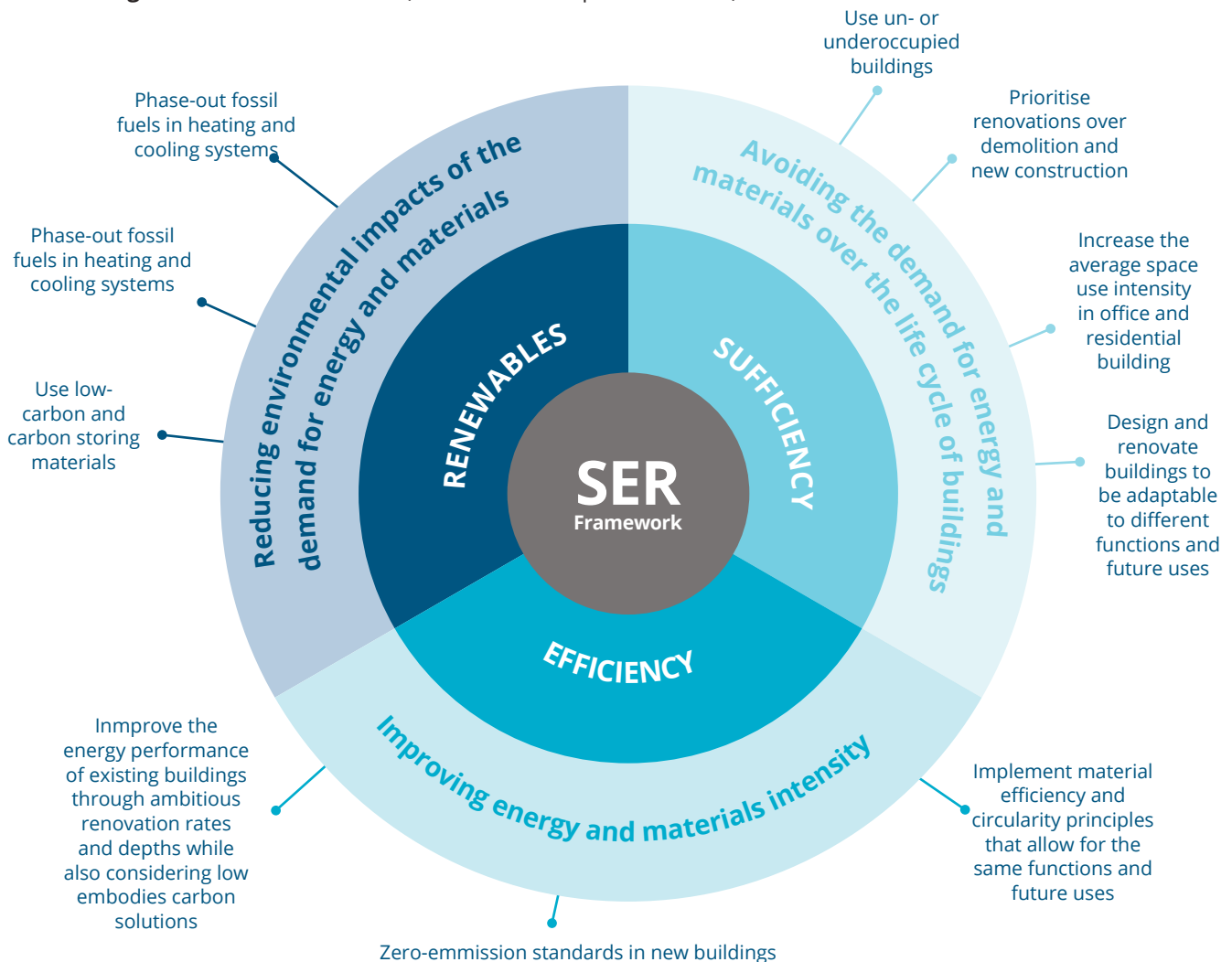
<sup>13</sup> <https://www.unep.org/events/conference/buildings-and-climate-global-forum>

<sup>14</sup> <https://wcef2024.com/sessions/ws4-accelerating-circularity-from-a-sufficiency-perspective/>

# HOW DOES SUFFICIENCY RELATE TO EFFICIENCY AND RENEWABLES?

- **S**ufficiency “tackles the **CAUSES** of environmental impacts of human activities by avoiding the demand for energy and materials over the lifecycle of buildings and goods”, long-term actions driven by non-technological solutions (i.e., land-use management and planning), which consume less in absolute term and are determined by biophysical processes.
- **E**fficiency “tackles the **SYMPTOMS** of environmental impacts [...] by improving energy and materials intensities”, continuous marginal technological improvements.
- **R**enewables “tackles the **CONSEQUENCES** of environmental impacts [...] by reducing the carbon intensity of energy supply.”

Figure 2: The SER Framework (outer section adapted from IPCC)



## 'TWO TYPES OF ENOUGH': THE OPPORTUNITY TO LINK CLIMATE, ENVIRONMENTAL AND SOCIAL TARGETS

Many European cities are facing a critical housing crisis, driving the urgent need to create new units that can address the rising demand for more affordable living spaces. The EU Commission President has appointed the EU's first ever Commissioner for Energy and Housing, with the clear mandate to address both affordable housing and energy related matters.

**This goal presents a significant challenge: How can the EU balance the construction of new housing against the need to meet climate and environmental objectives, including land conservation and biodiversity protection?**

As highlighted in the ENVI Council Conclusions from June 2024, the EU's consumption footprint remains well beyond sustainable levels within planetary boundaries<sup>15</sup>. Here, sufficiency offers a promising solution, potentially reconciling these competing priorities and fostering a more inclusive approach to housing policy.

Sufficiency offers a broader vision of sustainable development beyond decarbonisation, the lens through which it is typically understood. The IPCC defines sufficiency policies as: "a set of measures and daily practices that avoid demand for energy, materials, land and water while delivering human well-being for all within planetary boundaries".<sup>16</sup>



**A sufficiency-economy is a systemic solution to overconsumption and inequality in which there is enough for everyone, forever.<sup>17</sup>**



Already integrated in national policy strategies in France<sup>18</sup> and Thailand<sup>19</sup>, the concept of sufficiency is applicable to countries at varying stages of development and helps to address different Sustainable Development Goals (SDGs).

Sufficiency embodies a 'dual dimension', or what has been termed as 'two types of enough'.<sup>20</sup> The concept operates as both a *minimum* and *maximum* standard. Sufficiency as a minimum ensures decent living standards for all, while sufficiency as a maximum calls for avoiding unnecessary energy and resource consumption to stay the within limits of planetary boundaries. This dual dimension illustrates how a climate neutral building stock can be flexible and equitable, adjusted to meet the specific needs Member States.

<sup>15</sup> ENVI Council Conclusions from 17/6/24. The 8th Environmental Action Programme Mid-term Review. Available online at: <https://data.consilium.europa.eu/doc/document/ST-11326-2024-INIT/en/pdf>

<sup>16</sup> IPCC (2022): Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Available online at: [https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC\\_AR6\\_WGIII\\_Chapter09.pdf](https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_Chapter09.pdf), p.957

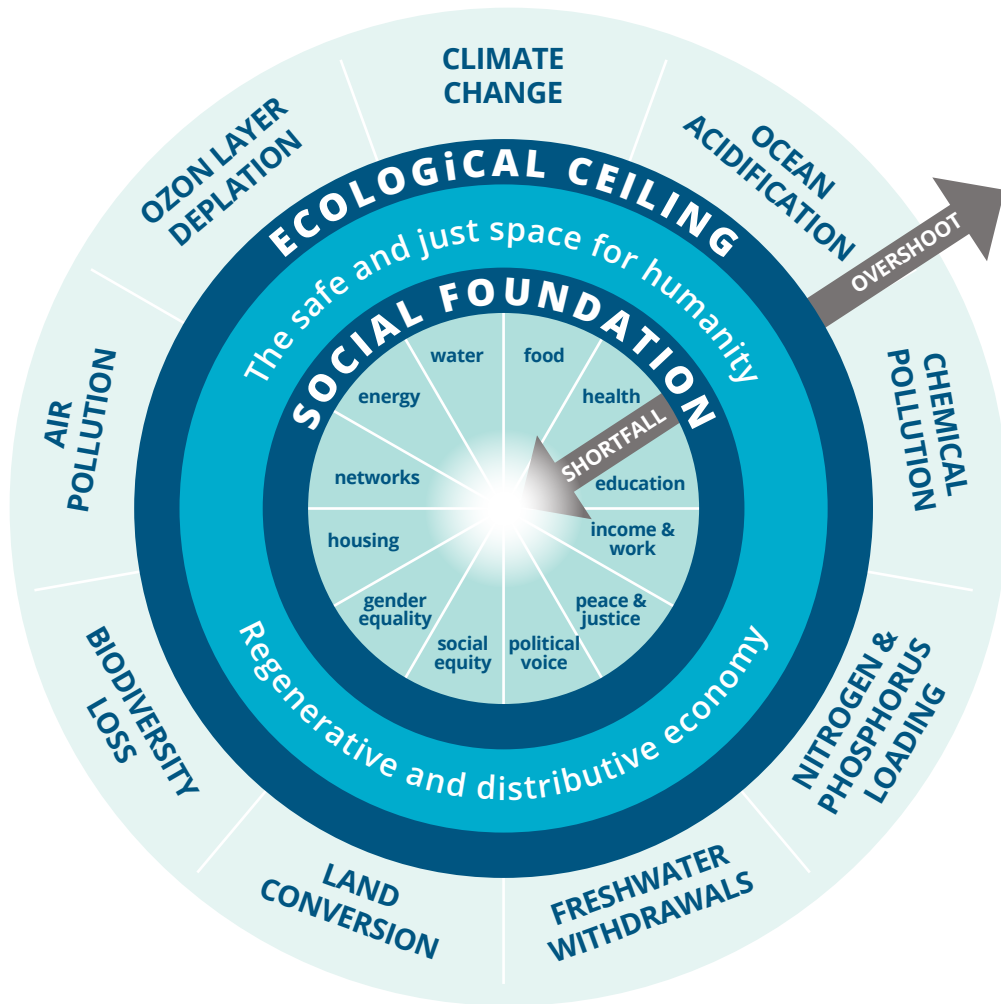
<sup>17</sup> Alexander, S. (2015). Sufficiency Economy: Enough, for Everyone, Forever. ISBN-10: 0 0994160615

<sup>18</sup> See LOI n o 2015-992 du 17 août 2015 relative à la transition énergétique pour la croissance verte (1) in France, [https://cdn.climatepolicyradar.org/navigator/FRA/2015/law-no-2015-992-on-energy-transition-for-green-growth-energy-transition-law\\_ce0a35ebcc760af8c2fcaae5e7796360.pdf](https://cdn.climatepolicyradar.org/navigator/FRA/2015/law-no-2015-992-on-energy-transition-for-green-growth-energy-transition-law_ce0a35ebcc760af8c2fcaae5e7796360.pdf)

<sup>19</sup> Mongsawad, P., 2012: The philosophy of the sufficiency economy: a contribution to the theory of development. Asia-Pacific Dev. J., 17(1), 123-143, doi:10.18356/02bd5fb3-en.

<sup>20</sup> Spengler, L. (2016). Two types of 'enough': sufficiency as minimum and maximum. Available online at: <https://www.tandfonline.com/doi/full/10.1080/09644016.2016.1164355>

**Figure 3:** Corridor of human wellbeing within planetary boundaries, doughnut economic model<sup>21</sup>



Sufficiency aligns with a vision that seeks to fulfil the international human right to adequate housing, viewing buildings as vital components of societal well-being. Rather than being seen merely as material possessions or tradeable assets, buildings serve to foster social cohesion, employment opportunities, access to infrastructure, safety, culture and community life.

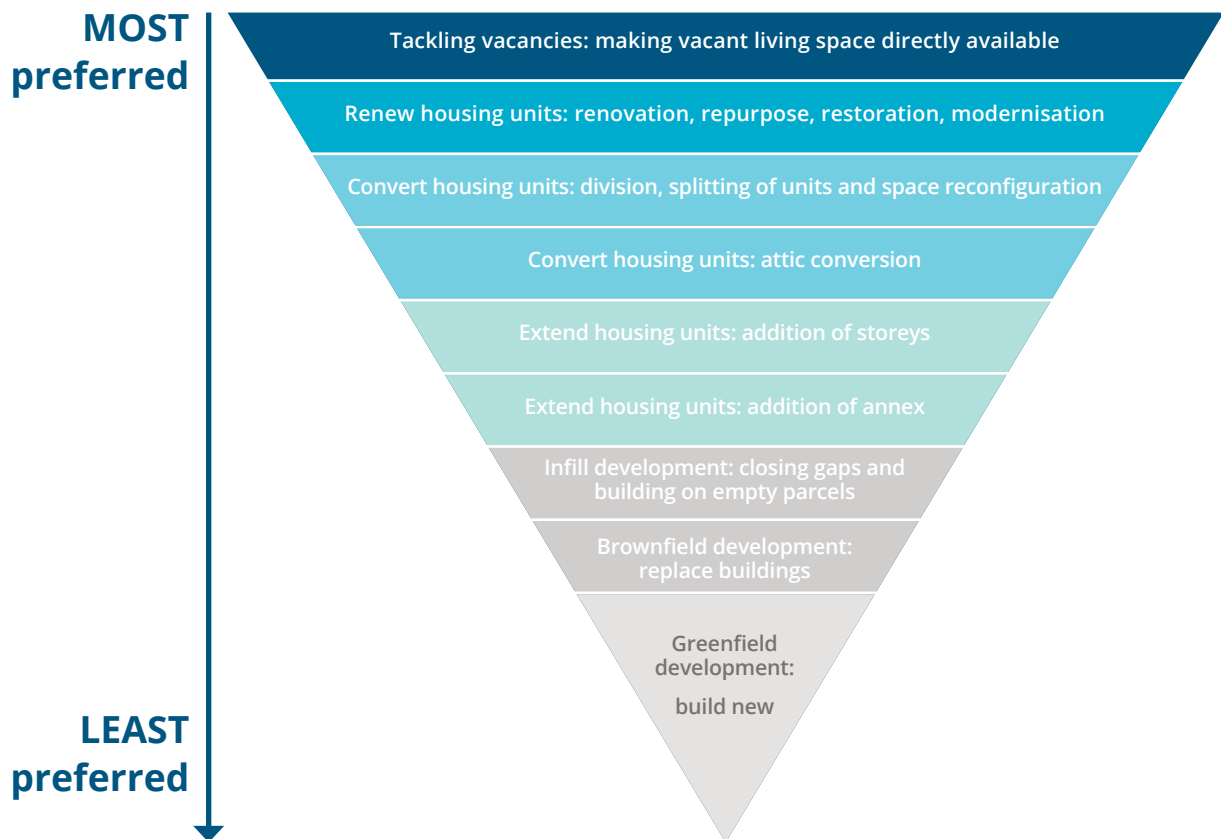
<sup>21</sup> DoughnutEconomics (2019). Environmental doughnut infographic. Available at : [https://commons.wikimedia.org/wiki/File:Doughnut\\_%28economic\\_model%29.jpg](https://commons.wikimedia.org/wiki/File:Doughnut_%28economic_model%29.jpg)

## DECISION PYRAMID FOR PRESERVATION AND RENEWAL OF EXISTING BUILDINGS

This proposed framework emphasizes the value- and needs-oriented preservation of existing buildings over new construction. It illustrates a decision-making cascade: the preservation and renewal of existing buildings should always be the top priority, followed by the expansion of existing buildings.

If not all requirements can be met through these approaches, new construction can be considered, guided by sufficiency principles. Sufficiency principles can be applied on a unit level, on a building, or even neighbourhood level.

**Figure 4:** Decision-making pyramid<sup>22</sup>



<sup>22</sup> adapted from Zimmermann & Firat (2024): Building sufficiency – five measures for an unerring and just transition of the building sector. eceee 2024, BBSR (Ed.), 2023: Unterstützung von Suffizienzansätzen im Gebäudebereich (EN: *Support of sufficiency approaches in the building sector*). BBSR-Online-Publikation 09/2023, Bonn

# THE POTENTIAL OF SUFFICIENCY MEASURES – WHAT DO WE KNOW SO FAR?

An increasing body of research is dedicated to quantifying the potential benefits of sufficiency approaches in the building sector. Moreover, initial research on the social acceptance of sufficiency measures suggests that they are more widely accepted than anticipated and are perceived to have the potential to enhance well-being and quality of life.

The integration of sufficiency interventions in building stock models is still in its early stages. This is primarily due to the inherently complex and socio-behavioural nature of these interventions, which presents challenges for accurate modelling<sup>23</sup>. Sufficiency scenarios are typically represented by translating assumptions about qualitative lifestyle changes into quantitative modelling parameters. For example, many studies assume the adoption of more efficient and shared appliances, or that building users will cut back on heating and cooling (referred to as 'energy sufficiency'). Another common assumption is the reduction of per capita living space, which several studies identify as having the most significant impact<sup>24</sup>.

## CLIMATE AND ENVIRONMENTAL BENEFITS

Many studies seek to quantify the carbon-saving potential of sufficiency measures. However, rather than focusing solely on the building sector, they often adopt a broad cross-sectoral approach that includes various changes such as diet or mobility behaviour. While these studies highlight the overall emissions reduction potential of sufficiency, it remains challenging to determine the specific impact attributable to building-related sufficiency measures, and even more difficult to assess the contribution of individual actions within the building sector<sup>25</sup>.

<sup>23</sup> Mastrucci, A. et al. (2022). Modeling Low energy Demand Future for Buildings: Current State and Research Needs. Available online at: <https://www.annualreviews.org/doi/10.1146/annurev-environ-112321-102921>

<sup>24</sup> i.e. Kenkmann, T., et al. (2019). Flächensparend Wohnen. Umweltbundesamt.; Fischer, C., et al. (2016). Konzept zur absoluten Verminderung des Energiebedarfs: Potenziale, Rahmenbedingungen und Instrumente zur Erreichung der Energieverbrauchsziele des Energiekonzepts. Umweltbundesamt; Zimmermann, P. (2022). Transition pathways for the European building sector: Comparison of environmental saving from sufficiency, consistency, and efficiency measures. TATuP Journal for Technology Assessment in Theory and Practice, 31(2), 32-39; BBSR (Ed.). (2023). Unterstützung von Suffizienzansätzen im Gebäudebereich. BBSR-Online-Publikation 09/2023, Bonn.

<sup>25</sup> e.g. Kuhnhenh, et al. (2020). A Societal Transformation Scenario for Staying Below 1.5°C. Heinrich Böll Foundation ([here](#)); Association négaWatt (2022): the energy transition at the heart of a societal transition ([here](#)).

**Applying various sufficiency measures to the European building stock would result not only in a significant 16% reduction of GHG emissions compared to past EU trends, but also a significant 61% decline in demand for renewable resources and a 9% decrease in demand for non-renewable resources <sup>26</sup>.**

The findings of the Zimmermann (2022) study starkly contrast with scenarios that focus solely on efficiency or renewable measures to meet climate goals, which result in only a 1% reduction in demand for renewable resources (such as wood for building materials and bioenergy) and a 3% reduction in demand for non-renewable resources (including sand for cement and glass production, as well as iron for steel production used in buildings, infrastructure, and household appliances). Among the sufficiency measures modelled, reducing living space proves to be the most impactful across all categories. The scenario assumes living space per capita is reduced to 37 m<sup>2</sup> by 2050.

**In Germany, housing demand could be met by using the existing stock, which would save over a fifth of the required emissions reductions and approximately 60% of the materials needed.**

Two studies from Germany have adopted a bottom-up approach by assessing the potential to reclaim space through measures like extensions, repurposing, and shared use. These studies showcase the striking potential of building sufficiency measures. In both cases, the potential savings were calculated by comparing the reclaimed space to the average embodied carbon that would be generated if the same amount of space were built new.

- Using Germany's existing building stock effectively through measures such as extension, conversion, sharing and subletting could theoretically save 9 million tonnes of CO<sub>2</sub>e. This represents one-fifth of the emissions reduction target originally set for the industry sector by the German Climate Protection Act<sup>27</sup>. Additionally, this approach could potentially save about 60% of the materials required compared to a scenario relying solely on new construction to meet annual housing demand of 400.000 units in Germany.<sup>28</sup>
- By optimising the use of a fraction of currently under-occupied spaces through subletting "invisible living space"<sup>29</sup>, without requiring any renovation or conversion measures, every 20th new construction could theoretically be avoided<sup>30</sup>. This equates to roughly 5% of Germany's estimated annual housing demand of 400.000 units. Such a shift could result in potential GHG emission savings of 1 to 2 million tonnes CO<sub>2</sub>e annually, based on the avoided embodied carbon associated with the new build.

<sup>26</sup> Zimmermann, P. (2022). Transition pathways for the European building sector: Comparison of environmental saving from sufficiency, consistency, and efficiency measures. *TATuP Journal for Technology Assessment in Theory and Practice*, 31(2), 32-39.

<sup>27</sup> The German Climate Protection Act originally attributed the emissions from the production of building materials to the industry sector, which was required to save 53 million tonnes of CO<sub>2</sub> by 2030 compared to 2020. The sector targets were cancelled in April 2024, meaning that only the overarching target still applies. It cannot be assumed that any sector will overachieve, therefore, the required efforts are still valid.

<sup>28</sup> BBSR (Ed.), 2023: Unterstützung von Suffizienzansätzen im Gebäudebereich (EN: *Support of sufficiency approaches in the building sector*). BBSR-Online-Publikation 09/2023, Bonn.

<sup>29</sup> Defined as: The term "invisible living space" refers to existing living space, not utilised by occupants (e.g. a kid's room after they moved out). Residents themselves acknowledge that they do not use or require them, thus indicating a voluntary openness to exploring alternative ways to make the invisible living space usable (Fuhrhop 2023, p. 81)

<sup>30</sup> Fuhrhop (2023): Der unsichtbare Wohnraum. Wohnsuffizienz als Antwort auf Wohnraummangel, Klimakrise und Einsamkeit (EN: *The invisible living space. Housing sufficiency as an answer to the housing shortage, climate crisis and loneliness*). transcript Verlag, Bielefeld

## SOCIAL ACCEPTANCE

**“Living smaller” is not always perceived as negative. In fact, adjusting the living arrangements can increase well-being for certain segments of the population.**

Various German studies<sup>31</sup> have found that many individuals, particularly those aged 55 and older, feel their living accommodations are excessive. A significant proportion express willingness to relocate under certain conditions, such as staying in their current neighbourhood or finding a residence that align with their current expenses. Additionally, there is a noticeable interest in unconventional housing arrangements, such as house exchanges and communal living setups, highlighting substantial potential for increased mobility and a desire to reduce average living space per person.

**Citizens are more open to embracing sufficiency than decision-makers typically assume.**

Citizens' assemblies – forums of randomly selected individuals designed to represent a cross-section of society – deliberate on specific topics with expert guidance. These assemblies overwhelmingly favour a substantially higher number of sufficiency measures for the building sector compared to government plans (National Energy and Climate Plans, NECP), with preferences ranging from three to six times higher<sup>32</sup>. While the building sector has fewer sufficiency policies compared to other sectors, there is a clear demand for regulatory interventions. 'Hard' regulation has been identified as the most recommended instrument, particularly for new construction.

## ECONOMIC IMPLICATIONS AND COSTS

In recent years, prospective home buyers and tenants across Europe have experienced a surge in prices alongside a significant decline in housing supply, drastically reducing the availability of affordable options. Research indicates that repurposing or converting existing structures (such as offices into residential units) is often less expensive than new construction, making it an economically viable solution to address the shortage of affordable housing.<sup>33</sup>

<sup>31</sup> Thomas, S. et al. (2019). Energy sufficiency policy for residential electricity use and per-capita dwelling size. *Energy Efficiency*, 12(5), 1123–1149. <https://doi.org/10.1007/s12053-018-9727-4>; Brischke, L.-A., et al. (2016). *Energiesuffizienz: Strategien und Instrumente für eine technische, systemische und kulturelle Transformation zur nachhaltigen Begrenzung des Energiebedarfs im Konsumfeld Bauen/Wohnen: Endbericht IFEU, Inst. für Energie- und Umweltforschung. (EN: Energy sufficiency: Strategies and instruments for a technical, systemic and cultural transformation to sustainably limit energy demand in the building/housing consumer environment.)*

<sup>32</sup> Lage, J. et al. (2023): Citizens call for sufficiency and regulation – A comparison of European citizens assemblies and National Energy and Climate Plans. *Energy Research & Social Science* 104. <https://doi.org/10.1016/j.erss.2023.103254>

<sup>33</sup> Zimmermann & Firat (2024): Building sufficiency – five measures for an unerring and just transition of the building sector. *eceee* 2024.

## SUSTAINABLE AND JUST DEVELOPMENT FOR ALL

**Sufficiency contributes to a globally fair and just transition to a climate neutral economy.**

Income inequality closely overlaps with carbon emissions inequality, highlighting how those with lower incomes often bear a disproportionate burden of environmental impacts. This global carbon inequity is increasingly driven by extreme and growing inequalities within countries: the richest 10% account for nearly half of all consumption emissions, representing almost two-thirds of global carbon inequality.<sup>34</sup>

Reducing living space for certain segments of the global population can enable an increase in living space for others, promoting a more equitable distribution of living space among citizens. In a global scenario<sup>35</sup>, this is achieved by assuming varying living space size development for industrialised countries and less economically developed countries<sup>36</sup>. The former would need to reduce their living space by 25% (accompanied by doubling the number of people in households), whereas the latter are assumed to witness a 20% increase in living space, resulting in a more equitable distribution of living space while recognising constraints of the global carbon budget.

<sup>34</sup> UNEP (2020) The emissions gap report. Accessible at: <https://www.unep.org/emissions-gap-report-2020>

<sup>35</sup> Kuhnhen et al (2019): A Societal Transformation Scenario for Staying Below 1.5°C. (Ed.): Heinrich Böll Foundation and Konzeptwerk Neue Ökonomie.

<sup>36</sup> The distinction is made between industrialised countries and economies in transition listed in Annex of the United Nations Framework Convention on Climate Change (UNFCCC).

# TOWARDS PRIORITISING EXISTING BUILDINGS: POLICY RECOMMENDATIONS

Implementing sufficiency solutions across all governance levels is essential to reduce climate and environmental impacts while effectively addressing the housing crisis. The following recommendations and examples can provide guidance for the next steps.

## MAKE BEST USE OF VACANT OR UNDEROCCUPIED BUILDINGS BY COLLECTING DATA (E.G. VACANCY REGISTER).

Repurposing vacant buildings is a low-hanging fruit that begins with identifying available floor area suitable for use. However, few municipalities have the data or programmes in place to monitor vacancies. In Germany, for example, only 50% of cities keep track of empty plots, 25% identify building vacancies, and only 8% identify infill potential<sup>37</sup>. Support from the EU and national levels is crucial to address this gap.

### ► SUFFICIENCY IN ACTION: DATA-DRIVEN APPROACHES TO HOUSING VACANCIES

Multi-governance collaboration and data to bring vacancies back to the market, France<sup>38</sup>: The French National Government, in collaboration with local authorities, has enacted a National Plan to Combat Vacancy. On the national level, there are 1.1 million long-term vacancies (defined as properties vacant for longer than two years), which represents 3.5% of the building stock. It is estimated that 300,000 homes could be brought back into the housing market, reducing the need for new construction. This plan not only provides municipalities with vacancy data but also offers tools for contacting owners of vacant properties. As of February 2024, 64% of municipalities in mainland France are now addressing the issue of vacancies, gaining a better understanding of the complex factors contributing to it and enhancing their capacity to find solutions<sup>39</sup>.

#### TOOLKIT TO MAP VACANCIES TO BE TURNED INTO AFFORDABLE HOUSING, POLAND<sup>40</sup>:

The toolkit “Adaptation of Empty Spaces for Affordable Apartments” offers guidance to local organisations and charities on converting vacant commercial spaces into quality social housing. Developed by Habitat for Humanity Poland in collaboration with the Institute of Urban and Regional Development which mapped vacancies across Poland, and other Polish researchers and associations, the toolkit focuses on local case studies in Warsaw, Kielce, and Zawiercie. It provides data on vacant spaces, outlines legal and financial mechanisms, and offers recommendations for making unused spaces, vacant for at least 12 months, available for housing.

<sup>37</sup> Blum, A.; Atci, M. M.; Roscher, J.; Henger, R.; Schuster, F., 2022: Building land and inner development potentials in German cities and municipalities. In: BBSR online publication. 11/2022. BBSR. Bonn.

<sup>38</sup> “Plan national de lutte contre le logements vacants”: <https://ecologie.gouv.fr/plan-national-lutte-contre-logements-vacants>

<sup>39</sup> Peggy MERTINY, Cheffe de projet "lutte contre la vacance de logements" et intrapreneuse Zéro Logement Vacant - Direction de l'habitat, de l'urbanisme et des paysages (DHUP) (personal communication 15/2/2024)

<sup>40</sup> [https://habitat.pl/files/Adaptation\\_of\\_empty\\_spaces\\_for\\_available\\_apartments.pdf](https://habitat.pl/files/Adaptation_of_empty_spaces_for_available_apartments.pdf)

## PRIORITISE THE PRESERVATION, REPURPOSING AND REUSE OF THE EXISTING BUILDING STOCK AHEAD OF NEW CONSTRUCTION.

Maximising the potential of existing building stock requires fundamentally rethinking the persistent focus on new construction and traditional building methods. Sufficiency challenges the industry to do more with less, valuing and reusing what already exists. It is important to demonstrate that "new" is not always better — there's cultural and historical value in thoughtfully repurposing existing structures. The Affordable Housing Initiative currently developed by the new EU Commission is a key opportunity to recognise the unexploited potential of the existing housing stock and ensure alignment with our climate targets.

Simplifying planning regulations and making repurposing easier than new construction are crucial steps. Many repurposing projects fail due to outdated regulations around fire safety or parking requirements. Local authorities can incentivise densification, while public financing can support the preservation and renovation of historic buildings. Mandatory demolition audits are essential to unlock the reuse potential of components and materials. Pilot renovation and revitalisation projects that use low-carbon, circular materials, initiated through public tenders and competitions, can serve as inspiring examples for future developments.



### SUFFICIENCY IN ACTION: CREATIVE SOLUTIONS FOR SOCIAL HOUSING AND URBAN RENEWAL

#### **Office conversion for social housing, Ireland<sup>41</sup>:**

In Dublin 12's Park West Business Park, two long-abandoned office buildings were converted into 86 social housing units, providing homes for more than 200 people. The transformation was made possible by Hartcourt Developers, the owners of the buildings, and Tuath Housing, a non-profit organisation that has been delivering social housing in Ireland since 2000. The project's success relied heavily on the collaboration with Dublin City Council, which also helped fund the initiative. A key aspect of the project was repurposing unused spaces into communal areas to foster social interaction among the residents.

#### **Competition to repurpose unattractive sites to innovative spaces, France<sup>42</sup>:**

The "Reinventing Paris" city challenge is an initiative launched in 2014 by the City of Paris to transform 23 underutilised or vacant sites into innovative and sustainable urban spaces. Many of these sites lack iconic status, and some are even deemed unattractive. The call for proposals aims to highlight these locations, urging multidisciplinary teams to devise clever and feasible new concepts for renovation and repurposing of existing structures to promote sustainable urban development and preserve historical and cultural heritage. The idea has been taken up by the C40 city network, to also actively prepare their own version for a similar call for innovative projects (Reinventing Cities<sup>43</sup>).

<sup>41</sup> <https://www.irishtimes.com/ireland/housing-planning/2022/11/01/former-dublin-office-complex-to-provide-homes-for-more-than-200-people/>

<sup>42</sup> <https://www.paris.fr/pages/reinventer-paris-4632>

<sup>43</sup> <https://www.c40reinventingcities.org/>

**Offering re-used materials for renovation and construction products, Germany<sup>44</sup>:**

Among its many offerings, Concular, a German start-up, has built an online platform and shop for circular building materials. In office buildings about to be refurbished, Concular assesses and maps the materials, including used lamps, doors, windows, and ceiling panels, uploading them to their platform to bring supply and demand together. Registered users can find it in stock or are notified when their desired item arrives. The opportunity to seamlessly integrate the reclaimed building materials into new projects also saves storage and transport costs. According to its own information, Concular, which was launched in 2020, has implemented 250 projects to date, including the conversion of the Karstadt department stores' on Hermannplatz in Berlin and the dismantling of a Siemens conference centre on Lake Starnberg. A total of 20,000 tonnes of building materials have been reused, saving around 2,500 tonnes of CO<sub>2</sub>.



**Maximising the potential of existing building stock requires fundamentally rethinking the persistent focus on new construction and traditional building methods. "New" is not always better — there's cultural and historical value in thoughtfully repurposing existing structures.**



<sup>44</sup> <https://shop.concular.de/>

## INCENTIVISE MORE EFFICIENT USE OF SPACE AT BOTH THE BUILDING AND NEIGHBOURHOOD LEVELS.

Incentivising a more efficient use of space at building and neighbourhood level requires zoning regulations that promote mixed-use developments as well as updated development plans and building regulations to facilitate easy conversion, extension and addition of floors. Tax systems should support subletting and eliminate barriers to efficient space utilization, encouraging more flexible and adaptive use of existing spaces. Also, stricter regulations on short-term rental services help to ensure that the portion of housing remains available for long-term residents.



### SUFFICIENCY IN ACTION: INNOVATIVE STRATEGIES TO OVERCOME HOUSING CHALLENGES

#### Sharing invisible living space, Belgium<sup>45</sup>:

The Belgian initiative 1Toit2Ages facilitates housing arrangements between individuals willing to sublet their unused space in large apartments and students in need of accommodation. Since its launch in 2009, the program has created 5,220 housing arrangements, with the number of matches growing steadily—600 in 2023 alone. As a result, many seniors now have less unused space, potentially reducing the need for new student housing construction. Beyond providing affordable accommodation in competitive markets, the initiative also fosters social bonds by reducing loneliness and strengthening intergenerational connections.

#### Incentives for conversion of large single-family homes, Germany<sup>46</sup>:

In Baden-Württemberg, the "Turn Old into Two or More" consulting bonus offers property owners guidance on subdividing large single-family homes into multiple units<sup>47</sup>. During the pilot phase (2021 to mid-2023) in the Ravensburg region, covering four municipalities, nearly a quarter of homeowners have taken initial steps or plan to convert their homes soon. This approach promotes the creation of housing within existing structures, reducing the need for new developments. It also leads to significant savings on infrastructure costs, such as building additional roads.

#### Regulation of occupancy density in housing associations, Switzerland<sup>48</sup>:

The majority of housing associations in Switzerland have regulations regarding the minimum occupancy rate to avoid under-occupancy of their apartments. In cases of under-occupancy, either a tax is imposed, or residents are encouraged to move to a smaller or larger apartment.

#### Incentivising conversion through updated land use plans, Sweden<sup>49</sup>:

Sweden has introduced a planning incentive to reward municipalities for revising their land use plans to allow, for example, for the conversion of office spaces into residential units.

<sup>45</sup> <https://www.1toit2ages.be/>

<sup>46</sup> Interview Christa Gnann, Gemeinwesenarbeit und Bürgerkontaktbüro Bodnegg (EN: Community work and citizen contact office) (12/2/2024)

<sup>47</sup> <https://www.baden-wuerttemberg.de/de/service/presse/pressemitteilung/pid/neue-beratungspraemie-am-1-april-gestartet-1>

<sup>48</sup> <https://www.stadt-zuerich.ch/fd/index/wohnen-und-gewerbe/vermietungen/mietbedingungen.html>

<sup>49</sup> <https://svenskforfattningssamling.se/sites/default/files/sfs/2023-12/SFS2023-903.pdf>

## APPLY SUFFICIENCY PRINCIPLES IN NEW CONSTRUCTION.

When new construction is unavoidable, it should at least incorporate design principles for zero-carbon, resource efficiency, adaptability and resilience. This involves creating flexible, adaptable floor plans and communal areas that can evolve with the changing dynamics of household sizes and functions, ensuring longevity and relevance of the living spaces. Within the neighbourhood, new constructions should always be envisioned as complementary to existing structures, aimed at, for instance, freeing up larger apartments while introducing smaller residential units within the existing framework.



### SUFFICIENCY IN ACTION: THOUGHTFULLY COMBINING NEW BUILD WITHIN EXISTING STRUCTURES

#### **Applying sufficiency principles in new build, Collegium Academicum, Germany<sup>50</sup>:**

The Collegium Academicum in Heidelberg is a student housing project built on the principle of sufficiency. It promotes a sustainable lifestyle through its design and operations. Shared spaces and resource-efficient technologies help minimise consumption, fostering conscious, sustainable living. Residents can choose whether they prefer a smaller private space with more communal areas or the reverse, with most opting for smaller private rooms. These private spaces are equipped with specially adapted furniture to maximise the use of space, while communal areas are larger to encourage shared living. Sufficiency principles have been applied to both an existing building and a new construction project.

#### **When building new, consider how to best complement existing structures, Tübingen, Germany<sup>51</sup>:**

In Tübingen, a new building in the heart of the city has been designed to seamlessly integrate with the existing urban landscape. Its design caters especially to older residents who may be looking to downsize from larger apartments, perhaps following the loss of a partner or once their children have moved away. Not only does this approach facilitate a comfortable transition for seniors, but it also frees up living spaces within the neighborhood, benefiting families in search of homes.

<sup>50</sup> <https://collegiumacademicum.de/>

<sup>51</sup> Axel Burkhardt, Representative for housing and barrier-free construction, city of Tübingen (personal communication 16/11/2023)

## SUPPORT EXPERIMENTATION OF SUFFICIENCY INITIATIVES AND EXCHANGE OF EXPERIENCES AND AWARENESS RAISING.

Taking forward building-level sufficiency approaches and applying them in context requires significantly greater awareness of the diversity of approaches, the various contexts, and the involved actors. Deeper awareness and understanding in turns allows for the exchange of experiences between existing examples, enabling the identification, replication, and scaling up of successful initiatives.

Additionally, at the local level, so-called housing agencies, as already established in some German cities, can be set up to advise residents on sufficiency options within their individual living situation. This requires identifying needs and matching them with opportunities, for example, by consulting individuals living in overly large households with the idea of subletting or converting. This concept should ideally be integrated into the roll-out of One-Stop-Shops, which the new EPBD requires Member States to implement for renovation advice. The services could include raising awareness of relevant sufficiency solutions, such as changing the living situation for people who, for example, live alone in flats that are too large and are longing for community, or flat exchanges between inhabitants who need more or less space, respectively.



### SUFFICIENCY IN ACTION: ONE-STOP-SHOPS FOR OPTIMAL USE OF EXISTING BUILDINGS

#### **Living space agency providing advice to make best use of the building stock while securing individual needs, Göttingen, Germany<sup>52</sup>**

Göttingen has set up a Living Space Agency ('Wohnraumagentur') as part of the local public administration. The public facing platform offers comprehensive guidance and support aimed at promoting the more efficient use of existing living space in order to promote affordable and future-oriented housing development in the urban area. The agency's goal is not only to create and secure affordable housing, but also to develop innovative concepts for space-saving and communal living models for interested citizens. Acting similar to a one-stop shop, it also provides advice on financial programmes, particularly for those with lower income or accessibility needs.

<sup>52</sup> <https://www.goettingen.de/portal/seiten/wohnraumagentur-900000208-25480.html>

## USE SYNERGIES WITH OTHER POLICY FIELDS AND FORGE NEW ALLIANCES.

Ample opportunities exist to merge sufficiency measures with other policies and leverage synergies. For instance, the rollout of one-stop renovation advisory services as mandated in the 2024 EPBD could be used to provide advice on sufficiency considerations related to housing needs. Another option, energy-efficient neighbourhood development can focus attention on local densification and housing needs. Additionally, databases on vacancies could integrate energy performance classes, allowing for proactive contact with owners of poorly performing buildings and link this with renovation advice.

As many existing initiatives that contribute to a more efficient use of existing space are not primarily initiated from a climate perspective, but rather from a social angle, forging new alliances is of great importance. For example, housing advice centres can cooperate with mobile care services, churches or associations to reach people and discuss their needs, as well as existing options for changes in the individual living situation.

### SUFFICIENCY IN ACTION: LINKING VACANCY PREVENTION WITH RENOVATION

#### **Combining renovation and redensification assessments, Göttingen, Germany<sup>53</sup>:**

In Göttingen, sufficiency considerations are taken into account through an energy-efficient approach to neighbourhood development. The City of Göttingen started developing two energy-efficient neighbourhood concepts (KfW programme). In the analysis of the renovation potential and the expansion of renewable energies, they also include the potential for redensification, combining advisory service for citizens as intelligently as possible.

#### **Linking 'vacancy prevention' with renovation advice, France<sup>54</sup>:**

France's database which was set-up within the National Plan to Combat Vacancy (see above) includes the energy performance class of the building. Under the French MEPS (Minimum Energy Performance Standards) regulation, buildings with an Energy Performance class lower than G must be renovated at a specified time. The vacancy database is used to contact property owners and offer renovation incentives, thereby preventing vacancy and achieving compliance with MEPS regulation.

<sup>53</sup> Johanna Kliegel, Wohnraumagentur Göttingen (personal communication 25/01/2024)

<sup>54</sup> Peggy Mertiny, Cheffe de projet "lutte contre la vacance de logements" et intrapreneuse Zéro Logement Vacant - Direction de l'habitat, de l'urbanisme et des paysages (DHUP) (personal communication 15/2/2024)

## **INVEST IN RESEARCH ON THE QUALITATIVE AND QUANTITATIVE IMPACTS OF SUFFICIENCY INITIATIVES.**

To further develop the impact assessment and quantification of multiple benefits of sufficiency measures in the building sector, research needs to be scaled up. This will enable the development of standardised methodologies for evaluating the impact of actions such as using vacant building space, reducing under-occupancy, or promoting changes in user behaviour – capturing the climate, environmental and social co-benefits. This includes understanding how sufficiency measures designed with place-making and social purposes in mind contribute to economic, climate and environmental benefits. Additionally, exploring how different measures can collectively and mutually reinforce each other is essential for a comprehensive evaluation of the success factors of sufficiency initiatives. Lastly, a deeper understanding of the diversity of sufficiency approaches, contexts, and involved actors is essential. This will facilitate the exchange of experiences from existing examples, allowing for the identification, replication, and scaling up of successful initiatives.



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