



Federal Institute for
Research on Building,
Urban Affairs and
Spatial Development

within the Federal Office for
Building and Regional Planning



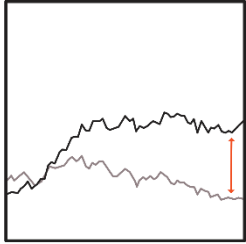
**SUSTAINABILITY ASSESSMENT OF NEIGHBORHOODS
IN A NATIONAL SUSTAINABLE BUILDING PERSPECTIVE:**

APPROACHING SUFFICIENCY MEASURE INTEGRATION

WB5 – BASICS AND SYSTEMATICS OF SUSTAINABLE BUILDING

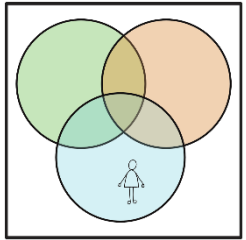
04.09.2023

Annika Hock



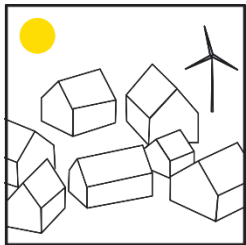
1. Sustainability measures and scenarios focus on efficiency & consistency strategies ¹

→ Sufficiency measures are necessary ²



2. Sufficiency-Gap in Sustainability Assessment of Buildings ³

→ Lack of Sufficiency-Indicators in the built environment

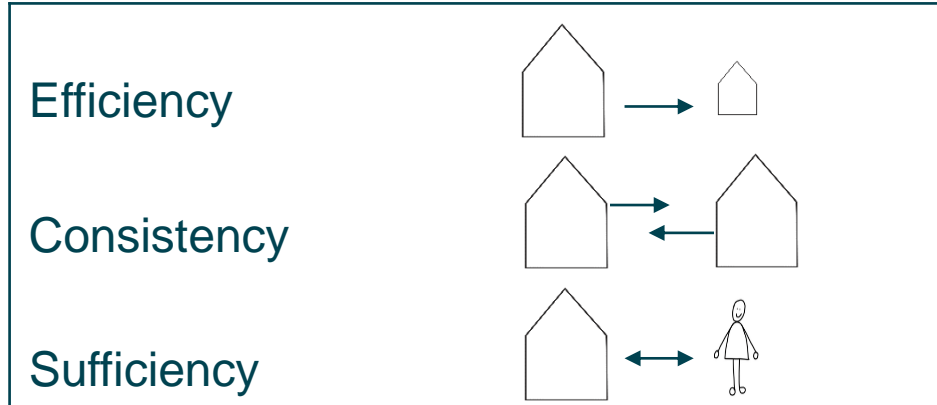


3. Synergies and interdependencies of buildings in a spatial relation ⁴

→ Neighbourhood Scope

1. Balembos, Emile; Bourgeois, Stephane (2022): Sufficiency's integration into climate and energy strategies. Clever - a Collaborative Low Energy Vision for the European Region.
2. IPCC (2023): Climate Change 2023: Synthesis Report. A Report of the Intergovernmental Panel on Climate Change. Contribution of Working Groups I, II and III to the Sixth Assessment Report. Hg. v. Intergovernmental Panel on Climate Change. IPCC. Geneva, Switzerland.
3. Hock, A.; Jäger, J.; Rietz, A. (2022): Sufficiency as a Criterion for Sustainability Assessment. In: *IOP Conf. Ser.: Earth Environ. Sci.* 1078 (1), S. 12033. DOI: 10.1088/1755-1315/1078/1/012033.
4. BBSR (2021): Klimaschutz im Gebäudebereich. Grundlagen, Anforderungen und Nachweismöglichkeiten für klimaneutrale Gebäude - ein Diskussionsbeitrag. Hg. v. Bundesinstitut für Bau-, Stadt- und Raumforschung im Bundesamt für Bauwesen und Raumordnung (BBR) (BBSR-Online-Publikation, 33)

SUFFICIENCY GAP



- Dominant certification of new construction
- Lack of per-capita budgeting (m²/p; hours of use)
- High comfort standards → i.e. acoustic comfort, thermal comfort, ...
- Lack of behaviour mapping (multifunctionality, multi-use)

Criterion



Parameter



Indicator

Objective

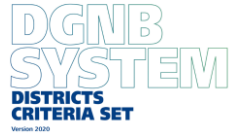
Carrier

Measurement

▪ *What parameters determine sustainability strategies in the different dimensions of the built environment?*

	Dimension	Efficiency <i>Functional increase in performance</i>	Consistency <i>Environmental- and Health-Compatibility of Design</i>	Sufficiency <i>"Appropriateness" of demand</i>	
SCALE ↑ ↓	Nation				
	Federal State (Region)				
	Municipality	<ul style="list-style-type: none"> Mandatory white/cool surfaces mandatory external solar protections mandatory technical (passive) efficiency measures density of use 	<ul style="list-style-type: none"> Renewable energy supply fossil free mobility concept permit requirement for demolition 	<ul style="list-style-type: none"> Walkable, cycable districts Access to public transportation Multi-modal mobility concepts 	1
				<ul style="list-style-type: none"> green spaces, spaces for playing and spaces (<i>in buildings</i>) for common activities 	2
	Neighborhood	<ul style="list-style-type: none"> Communal heat planning for neighborhoods & districts 	<ul style="list-style-type: none"> on-site energy generation by RES Energy storage 	<ul style="list-style-type: none"> sharing infrastructure for services and products "15 min city" (6 social functions: living, working, supplying, caring, learning and enjoying) 	3
	Block of houses	<ul style="list-style-type: none"> Serial renovation 		<ul style="list-style-type: none"> Neighborhood stores (i.e. repair stores) Semi-private spaces to reduce privately used area 	4
	Building	<ul style="list-style-type: none"> energy efficiency measures (i.e. insulation, heat recovery) area efficiency Window to Wall ratio use of rooftop area 	<ul style="list-style-type: none"> reduction of environmental impacts of full life cycle (LCA) 	<ul style="list-style-type: none"> Demographic and social diversity potential for change of use / flexible floor plan design 	5 6
	spatial Zones	<ul style="list-style-type: none"> performance-optimization (reduction of operational energy) simplified maintenance 	<ul style="list-style-type: none"> health safety 	<ul style="list-style-type: none"> (re)use of existing buildings and infrastructure reduction of enveloping (compactness) reduction of space requirement 	7 8
interior space					
building component					
building material					

How is Sufficiency approached within commonly represented SA of buildings in a spatial relation?



	DGNB SYSTEM		BREEAM Communities		SNBS AREAL			
	quantitative	qualitative	quantitative	qualitative	quantitative	qualitative		
	Sufficiency Barrier		Sufficiency Carrier		Sufficiency Barrier		Sufficiency Carrier	
1	●●	<ul style="list-style-type: none"> - local specifications/dependencies - lack of distributional criteria - need of adequate demand planning 	<ul style="list-style-type: none"> - safe and convenient cycling infrastructure - safe and convenient walking infrastructure - hierarchy of sustainable transport - multi-modal-transport system - convenient and inclusive public transportation 	●●	<ul style="list-style-type: none"> - lack of quantitative upper cap - local specifications/ dependencies - lack of distributional criteria 	<ul style="list-style-type: none"> - safe and convenient cycling infrastructure - safe and convenient walking infrastructure - hierarchy of sustainable transport - multi-modal-transport system - convenient and inclusive public transportation 	○	○
2	●	<ul style="list-style-type: none"> - efficiency focus (area) - omit of private land - lack of distributional criteria - lack of quantitative upper cap 	<ul style="list-style-type: none"> - quality management of open spaces - sufficient access to greenery - semi-public spaces (urban commons) 	●	<ul style="list-style-type: none"> - lack of distributional criteria 	<ul style="list-style-type: none"> - sufficient access to greenery 	○	○
3	●		<ul style="list-style-type: none"> - reduction of travel needs - local economies 	●●	<ul style="list-style-type: none"> - demographic specification 	<ul style="list-style-type: none"> - reduction of travel needs - local economies 	○	○
4	●	<ul style="list-style-type: none"> - difficulties to proof within planning phase 	<ul style="list-style-type: none"> - sharing culture - community facilities 	●	<ul style="list-style-type: none"> - difficulties to proof within planning phase 	<ul style="list-style-type: none"> - co-working spaces - community Facilities 	○	○
5	●	<ul style="list-style-type: none"> - lack of distributional criteria - lack of quantitative upper cap - need of adequate demand planning 	<ul style="list-style-type: none"> - local attractiveness - social integrity and diversity - social environment protection - diversity of floor space offers 	●	<ul style="list-style-type: none"> - lack of distributional criteria - lack of quantitative upper cap 	<ul style="list-style-type: none"> - local attractiveness - social Integrity 	○	○
6		<ul style="list-style-type: none"> - need of sufficiency orientation in trend research - overconsumption (holding space that might not be needed) 	<ul style="list-style-type: none"> - future demand orientation - flexibility and adaptability over time 		<ul style="list-style-type: none"> - lack of indicator specification 	<ul style="list-style-type: none"> - flexibility and adaptability over time 	○	○
7	●	<ul style="list-style-type: none"> - no systemic prioritisation 	<ul style="list-style-type: none"> - consideration of embodied energy 	●	<ul style="list-style-type: none"> - dependency on expert opinion - lack of indicator specification - no systemic prioritisation 	<ul style="list-style-type: none"> - overview of building stock and capacity in early planning stages - demand orientation 	○	○
8	●	<ul style="list-style-type: none"> - efficiency focus (area) - local specifications/ dependencies - lack of distributional criteria - need of adequate demand planning - lack of quantitative upper cap 	<ul style="list-style-type: none"> - compactness & low-tech of industrial buildings 				○	○

* Updated from 2000 Watt Areal to SNBS Areal in September 2023

OUTLOOK: INDICATORS

- What indicators constitute sufficiency assessment of buildings in a spatial relation in respect of environmental impacts on energy, material, land and water ?

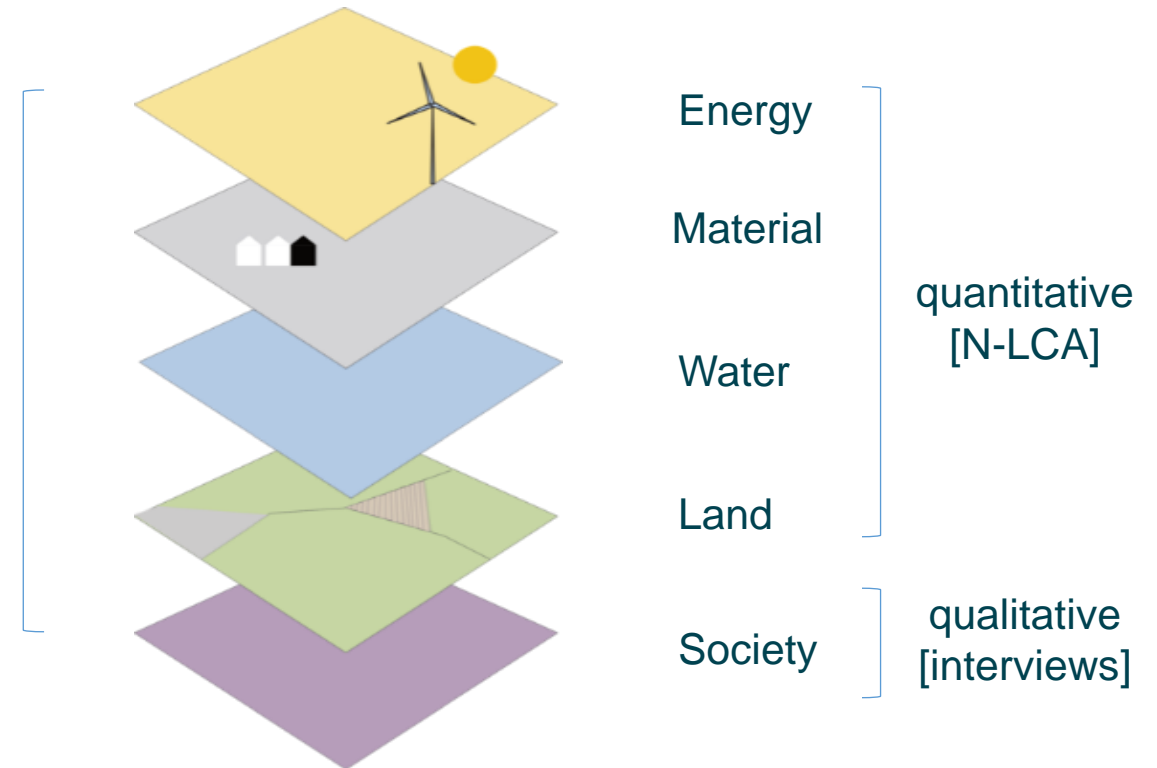
Sufficiency Policies



01	Mobility concept
02	Green, open and common spaces
03	Functional diversity
04	Sharing infrastructure for services and products
05	Demographic and social diversity
06	Multifunctionality and adaptability
07	Prioritization of existing building stock
08	Reduction of space requirement



Sufficiency Measures in Building Design



RETHINKING VALUE – RESOURCES FOR PLANETARY WELLBEING
4.- 6. SEPTEMBER 2023, GENEVA

#SUFFICIENCY

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