New Portfolio-Rating-System based on LEVEL(S)

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Abstract. In Switzerland, there are currently no instruments for the holistic and easily applicable assessment of the sustainability of existing buildings, which can also be applied to larger real estate portfolios and which are structurally based on Swiss or European sustainability standards. The instrument, developed as part of a ZHAW R&D project for the City of Zurich, Public Real Estate Management, is based on the already existing LEVEL(S) criteria structure. As distinguished from LEVEL(S), it can be applied to all types of buildings, including mixed buildings, and also scalable to larger portfolios of cities, banks, insurances or real estate investment funds.
LEVEL(S) is a voluntary reporting framework to improve the sustainability of buildings. Using existing standards, LEVEL(S) provides a common EU approach to the assessment of environmental performance in the built environment. In the current Version LEVEL(S) is suitable for new office and residential buildings and existing buildings at the time of a major refurbishment.
The paper shows, how the rating structures of Agenda2030/SDG's/GAPFRAME, ESCI City Rating System, DGNB and LEVEL(S) can be combined into a holistic evaluation system. If required, the developed portfolio analysis instrument can be coupled - with a more detailed building analysis as an intermediate step - directly with a DGNB renovation certification. It will show how sustaining property owners can be supported in this holistic way. Finally, the first findings from the practical application are explained. It will be shown how it is possible to support sustainably acting portfolio holders in this holistic way.

1. Introduction

Currently, the Swiss building park consists of approx. 2.5 million buildings with a total value of over EUR 2 trillion and approx. 1 billion m2 of floor space. Of these, approx. 1.7 million buildings are residential properties (approx. 1/5 of professional or institutional investors) and approx. 600,000 office und commercial properties (approx. 1/3 of professional or institutional investors). The annual building construction expenditure in Switzerland amounts to more than 50 billion EUR [1]. At present, professional or in particular institutional investors are becoming increasingly interested in being able to invest in new buildings and in refurbishing existing ones, while also taking sustainability into account.

From the perspective of Swiss portfolio holders, the first thing to do is to gain an overview of the sustainability of one's own real estate portfolio. This allows the portfolio to be broken down into sub-segments for which specific restructuring or investment strategies can then be developed and implemented.

The instruments currently used to assess the sustainability of real estate portfolios in Switzerland are usually only "one-dimensional" or relate to very few criteria. In the case of the economic dimension, for example, the parameters taken into account refer only to the structural condition of the buildings or, in the case of the ecological dimension, only to the specific and consumption-dependent environmental parameters (energy consumption). In many cases, social parameters, especially those relating to user satisfaction, are not collected, and if only unsystematically or incompletely.

In Switzerland, there are currently no instruments for the holistic and easily applicable assessment of the sustainability of existing buildings, which can also be applied to larger real estate portfolios and which are structurally based on Swiss or European sustainability standards. In the specific area of listed real estate properties, GRESB is used as an international ESG benchmarking tool. But, GRESB focuses primarily on the organization and the management processes and considers the single building limited to a few KPI's (LEED based). A holistic performance assessment as well as the derivation of concrete optimization measures at the level of individual buildings is therefore not possible.

Many of the major Swiss portfolio holders are also feeling the pressure at management level for greater sustainability transparency, driven on the one hand by an ever-increasing public debate on sustainability and on the other by increasingly stringent and detailed CSR guidelines and the associated requirements for company-specific sustainability reporting. At present, it is primarily a question of the transparency resulting from an evaluation and the possibility of better supporting decisions on necessary investments. Large-scale certification of the company's own real estate is generally not considered necessary immediately. However, it is expected that this will become necessary in the medium or longer term. In this respect, the interest in an appropriate evaluation instrument also corresponds to the need to find a way of gradually preparing for future CSR-requirements.

Based on these findings, the overriding problem or question that arises is how a future portfolio rating instrument should be designed which, on the one hand, is able to meet the general requirements of Swiss portfolio holders and, on the other hand, has the highest possible connectivity to all relevant national and international sustainability instruments.

The needs of the interviewed portfolio holder can be clustered into the following sub-requirements groups:

General requirements for the instrument:

1. Simple, effective and cost-effective applicability (time expenditure)
2. Flexible applicability due to the heterogeneity of the objects
3. Holistic assessment on all three dimensions of sustainability
4. General applicability (for public and private portfolio holders)
5. Focus on relevant aspects, central consideration of the climate topic
6. Performance-oriented definition of the criteria
7. Scientifically referenced criteria and indicators
8. Compatibility with international rating standards

General requirements for the structure of the instrument

1. Coordination with Agenda 2030 [2] and SNE (Sustainable Development Strategy for Switzerland) [3]
   in order to be able to support corresponding reporting requirements in the future.
2. Consideration of the structural condition under
   a) Alignment with national frameworks on sustainability
   b) Coordination with international frameworks with relevance for Switzerland
3. Adequate consideration of operational aspects

In summary, the main reasons to applicate a portfolio-rating-system can be derived from the following three core benefits:

- The benefits of continuous transparency through reporting in the CSR or Agenda 2030 context as well as with reference to risk management the identification of "risk objects" in the portfolio
- The benefits of hedging investments in new construction and renovation resp. the direct derivation of measures or at least as a basis for this and
- The benefit of optimizing building operations

2. Methodology

The structure of the research project is divided into three phases

1. Basic analysis, system development and definition of criteria
2. Development of the evaluation tool, pilot application
3. Monitoring and scientific evaluation

Only the results of the first phase are presented in more detail in this paper.

2.1. Basic analysis

The basic analysis comprised the evaluation of all national and international instruments existing in Switzerland with regard to their suitability relating to the evaluated requirements of the Swiss portfolio holders. This formed the basis for the selection of instruments which were used as a basis for the development of the new system architecture and criteria structure.

2.2 System development

During system development, the comparison was first made between the respective superstructures and the criteria of the selected instruments. In a further step, those criteria were evaluated which essentially form the intersection of the various sets of criteria analyzed. When selecting the criteria, however, not only the number of mentions was decisive, but also the relevance of the respective instruments (norm compatibility).

2.3 Definition of criteria and indicators

In a final sub-work package, adequate indicator definitions were sought in order to make the selected criteria assessable at portfolio level as well. On the one hand, these should be geared to the central theme of the criterion and at the same time permit simple evaluation at portfolio level.

The structure of the criteria descriptions is divided into four sub-areas:

1_Criterion_Name	9_Method:
2_Dimension:	10_System limit (delimitation/inclusion)
3_Subject area:	11_Valuation (a) qualitative:
4_Percentage of total evaluation:	12_Evaluation (b) quantitative:
5_Contribution to sustainable development:	13_Type of evaluation:
6_Objective:	14_Measured variables & characteristic values:
7_Explanation/benefit:	15_Referencing (National & International Instruments)
8_Added value (ecological/economic/sociocultural)	16_Further sources (literature, standards, guidelines, etc.)

3. Theoretical background

Switzerland has a large number of instruments for optimizing the sustainability of real estate.

The following aspects were selected as criteria for consideration in the context of instrument development:

- Comprehensive set of criteria in all three dimensions of sustainability
  - This excludes e.g. Minergie, GEAK, Energiestadt, GI, Stratus
- Public accessibility and usability
  - This excludes e.g. NRI, GeNaB, iCD, CS Green Property
- Relevance resp. distribution
  - This excludes e.g. ESI / NUWEL, INrate, SAM, BREEAM IN USE
- Relation to the local market and local norms (Switzerland, European Union)
  - This excludes e.g. LEED, WELL
- Relation to the use for individual buildings and aggregation on a portfolio scale
  - This excludes e.g. GRESB

Based on these "negative" selection criteria, 15 existing instruments were selected for detailed analysis. The aim of the analysis was, on the one hand, to find a set of criteria that is limited to the essential aspects of the sustainability of existing buildings in order to remain applicable to larger portfolios. On the other hand, all sustainability resp. performance dimensions should be considered equal and the structure should be compatible with as many instruments as possible. The instruments selected for the detailed analysis can also be assigned to the general requirements of the surveyed Swiss portfolio holders, as shown below:

3.1. Coordination with Agenda 2030 and SNE (Sustainable Development Strategy Switzerland)

- Inclusion of the Agenda 2030 at the level of sub-goals and inclusion of the gap frame instrument, as this is the only instrument known in Switzerland to provide an adequate translation resp. specification of SDG targets at company level, which also applies to building portfolios.
- Inclusion of the "Circle Indicateurs" instrument [5], as this is an instrument for the sustainability rating of Swiss cities that is aligned with the objectives of the SNE
- Inclusion of the Swiss «2000 Watt Area» Certification System [5]

3.2. *Consideration of the structural condition*

a) Matching national sustainability frameworks

- Inclusion of the SNBS - Standard Sustainable Building Switzerland [6]
- Inclusion of the SIA112/1 standard [7]: Sustainable construction - Building construction - Communication standard for SIA 112
- Inclusion of the KBOB/IPB guideline for sustainable real estate management of public and private clients [8]

b) Voting on international frameworks relevant to Switzerland

- Inclusion of the SIA 490 [9] as Swiss adaptation of the European Sustainability Standard CEN/TC350, which also operationalized at the detailed level via the DGNB/SGNI system
- Inclusion of the LEVEL(S) system [10], as the first EU-wide reporting tool for the sustainability performance of buildings.

3.3. Adequate consideration of operational aspects

- Inclusion of the GEFMA 160 classification [11], since requirements from the point of view Facility Management in the European area are most detailed in this instrument.
- Inclusion of the GiB instrument (Building in use) [12] in the context of the DGNB classification

In addition to these directly derivable instruments, the following two instruments were also considered:

- Inclusion of the SMEO system [13], as it is already used at the portfolio level, but is primarily used in French-speaking Switzerland
- Inclusion of the European ESCI City Rating System (Emerging and Sustainable Cities Initiative) [14], as it contains a detailed criteria and indicator structure that is also applicable to Swiss cities

4. Results

The overall structure is divided into the classic three performance dimensions of sustainability, each of which is equally weighted at 33.3%, and each of which is divided into three subject areas. This upper structure is the result of a comprehensive structural comparison of the 15 instruments examined and shows optimal compatibility based on the relevance of the instruments (norm compatibility).

Environment	**Society**	**Economy**
U1_Climate protection & energy	G1_Health & Wellbeing	W1_Building performance
U2_Material cycles	G2_Safety & Accessibility	W2_Building attractiveness
U3_Nature & Landscape	G3_Quality of spaces & communication	W3_Building resilience

Parallel to the analysis of the superordinate structures, the criteria of the selected 15 instruments were also compared in more detail, with the DGNB system [15] forming the reference structure. As a result of this time-consuming comparison, 23 criteria resulted, which essentially form the intersection of the different sets of criteria analyzed, limited to the performance-related criteria from the three dimensions of environment, society and economy of sustainable development.

As a result, the developed set of criteria is in good agreement with LEVEL(S) but is designed for existing buildings rather than new buildings or existing buildings at the point of major renovation and complements the European LEVEL(S) system with the following criteria:

- Inclusion of mobility in the life cycle assessment
- Inclusion of biodiversity issues
- Security & Accessibility
- Quality of stay & communication
- Building condition analysis
- Identity & (Building) Cultural Value

In comparison with GRESB (LEED based), the main KPIs of energy, greenhouse gas emissions, water consumption and waste are also calculated quantitatively.

In comparison to the existing DGNB usage profiles for new buildings and buildings in operation, the portfolio analysis tool developed concentrates on the actual performance dimensions. Only a few references are made to criteria from the process and technical quality dimensions. Nevertheless, the instrument developed has a consistent system for DGNB building analysis and DGNB refurbishment certification.

In the portfolio evaluation, the weighting shares of the other criteria to be "served" from the process and technical quality dimension are equally distributed among all evaluated portfolio criteria, resulting in 33.3% for each dimension. When switching from the portfolio to the more detailed building analysis view, these criteria then regain their original weighting. In project phase 2, the significance of the weighting mechanism will be checked in practical tests and, if necessary, adjusted on the basis of the results.

5. Discussion

The criteria structure developed shows for the considered topics an almost complete coverage ratio for "LEVEL(S)" and the "SGNI/DGNB system" (environment/society/economy dimensions). It is also very high for the two instruments "SNBS" and "KBOB Factsheets" (70-80%) and structurally very well compatible. In principle, a high coverage ratio with these instruments is a major advantage of the system developed. The strong link to the established European and international sustainability standards

(LEVEL(S) & DGNB) promotes a high international and national reputation, makes the system compatible with international and European developments and future-proof, and makes it easier to communicate. A high degree of coverage of the national planning instruments "SNBS" and "KBOB Factsheets" is important insofar as it enables continuity and uniform consideration of issues during the planning phase and subsequently during operation or over the entire life cycle. Indirectly, the effectiveness of sustainable planning and its effects in operation can also be better assessed and plausibility checked.

In project phase 2, the significance of the weighting mechanism will be checked in practical tests and, if necessary, adjusted on the basis of the results.

The coordination to instruments such as the "cercle indicateurs" or the "2000-Watt Area Certification" is somewhat less high, as these have a broader focus that goes beyond the building itself. The "Cercle indicateurs" was developed to cover the whole range of sustainable development issues. Many of these themes cannot be influenced by buildings, or only indirectly. However, those that can be influenced by buildings are also supported to a large extent. The same applies to the "2000-Watt Areas" system, which considers an entire area or neighbourhood. However, many criteria (e.g. participation, urban development, diversity of use, etc.) are geared to planning here and can only be influenced to a very limited extent in existing buildings.

The relationship to strongly planning-oriented instruments such as "SIA112-1" and "SMEO" is also somewhat less good. On the one hand, this is due to the fact that in the case of "SIA112-1" it is difficult to make a concrete allocation due to the fact that the existing thematic structure (e.g. solidarity, balance, consolidation, innovation) is only superordinate. With "SMEO", on the other hand, direct assignment is made more difficult by the phase-based structuring as well as by many purely planning-oriented criteria (e.g. location & architecture, development, construction site management, etc.).

With the operation process-oriented instruments such as "GEFMA160" or "SGNI-GiB Building in Use" many topics are considered process-oriented but not performance-oriented. For example, the "GEFMA160" has many process-related special requirements from pure management, which have no relevance at portfolio level or only indirectly influence the actual performance criteria (e.g. document & knowledge management, CAFM, etc.).

A comparison with the goals of "Agenda 2030" shows that a considerable number of subgoals can be directly or indirectly supported to varying degrees. This is likely to become increasingly important, especially in the future, when it comes to showing and reporting the sustainability impact of these instruments in more detail.

6. Conclusion

The developed portfolio rating instrument can offer a solution on how individual existing buildings can be holistically evaluated with regard to sustainability. Analogous to the same system as DGNB for buildings in operation, entire portfolios can be assessed with little effort. For each criterion, all buildings that have comparable basic conditions or characteristics are grouped into clusters for the evaluation.
A unique selling point is the combination of high standards compatibility with SIA 490 (CEN/TC 350), SIA 112/1 and SNBS in combination with high connectivity to international assessment instruments such as LEVEL(S) and the DGNB system.

Whether the system is also easy to apply, highly effective in its evaluation methodology and highly informative in terms of the evaluation and meaningfulness of derived measures will be seen in the next phase with pilot application.

The first application tests are currently only allowing provisional conclusions to be drawn in this respect. The first clear challenges are thus emerging at portfolio level. On the one hand, it is very difficult to distinguish many properties by specific criteria. On the other hand, due to the range of criteria, the required information must be gathered from a relatively large number of different data sources. In this respect, it is only possible to estimate how much initial effort can generally be expected on the basis of the pilot application.

Experience has shown, however, that this effort decreases considerably with a cyclically repeated evaluation.

The portfolio analysis instrument developed is designed in such a way that it can be coupled optionally or, if required, directly via a more detailed DGNB-based building analysis as an intermediate step to a final DGNB remediation certification. Here, too, it will only become apparent through effective application whether the chosen approach of deriving the weighting factors from the respective new building usage profile will in reality help to derive suitable conversion and refurbishment measures.

However, the first application results for simpler objects already show that the criteria are generally well applicable and also yield meaningful results. It can therefore be expected that in the future it will be possible in this way to use the developed portfolio rating instrument to provide holistic support to portfolio holders who act sustainably.

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Portfolio Rating Tool				LEVEL(S)		
themes	Nr	criteria		themes	criteria	indicators
U1_ Climate Protection & Energy	1	LCA CO2		Greenhouse gas emissions throughout the life cycle	1.2 Global warming potential along the life	4.1.1 CO2 content and moisture
	2	LCA Energy			1.1.1 Primary energy demand	4.1.2 Pollutants (construction products & outside air supply)
	3	LCA Mobility			1.1.2 Final energy demand (auxiliary indicator)	4.2.1 Time outside thermal comfort
U2_ Ressourcen cycles	4	Sustainable procurement		Resource-efficient and closed material cycles	2.1 Material list of the building	
					2.2 Scenario simulation in the LC	4.3.1 Daylight quality
	5	Recyclables Management			2.3 Waste and material during construction and	4.3.2 Tungsten quality
					2.4 Full LCA (7 Ind.)	4.3.3 Glare
	6	Water Management		Efficient use of water resources	3.1 Total water consumption	4.3.4 Daylight optimization over the year (simulations)
						4.4.1 External noise
						4.4.2 Impact sound
U3_ Nature & Landscape	7	Green Spaces & Biodiversity				
G1_ Health & Wellbeing	8	Indoor air quality - fresh air supply		Healthy and well-being promoting spaces	4.1 Indoor air quality	4.4.3 Airborne sound
	9	Indoor air quality - pollutants				4.4.4 Room acoustics
	10	Thermal comfort - winter			4.2 Thermal comfort	
	11	Thermal comfort - summer				
	12	Visual comfort			4.3 Lighting & Lighting Comfort (Future Aspect)	
						6.1.1 Construction costs
						6.1.2 Operating and maintenance costs
	13	Acoustic comfort			4.4 Acoustics & Sound Protection (Future Aspect)	6.1.3 IS costs
						6.1.4 Demolition & recycling costs
						6.2.1 Risks Future Leaseability
G2_ Security & Accessibility	14	Security				5.1.1. Scenario simulation 2030/2050
	15	Accessibility				5.1.2.1 Heating / Cooling: Thermally activated building
G3_ Room Quality & Communication	16	Room quality indoor				5.1.2.2 Shell: Insulation & Albedo (light surface)
	17	Room Quality outside				5.1.2.3 Ventilation: Thermally loadable air supply systems
				Life cycle costs and building value	6.1 Life cycle costs	5.1.3 Green infrastructure (trees)
W1_ Building performance	18	Operating cost				5.2.1 Wind / Rain / Snow / Temperature> Load Construction
	19	Building substance (repair backlog)				5.2.2 Flooding (eg heavy rainfall, flooding, dam failure, etc.)
						6.1.4 Demolition & recycling costs
W2_ Building attractiveness	20	Usability & space efficiency			6.2 Market risks	6.2.1 Risks Future Leaseability
	21	Identity-creating & (cultural) cultural value				
W3_ Building resilience	22	Temperature resilience		Adaptation to climate change and climate resilience	5.1 Temperature Resilience	5.1.1. Scenario simulation 2030/2050
						5.1.2.1 Heating / Cooling: Thermally activated building
						5.1.2.2 Shell: Insulation & Albedo (light surface)
						5.1.2.3 Ventilation: Thermally loadable air supply systems
						5.1.3 Green infrastructure (trees)
	23	Extreme weather resilience			5.2 Extreme Weather Resilience	5.2.1 Wind / Rain / Snow / Temperature> Load Construction
						5.2.2 Flooding (eg heavy rainfall, flooding, dam failure, etc.)

Table 1: Comparison of the structure of the new portfolio rating tool with the LEVEL(S) structure