Sustainability in Large Companies: A Comparative Analysis of Types of Certification

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Abstract. *Different types of certification were analyzed. It is stated in the paper that the basic aim of all certification systems is to evaluate and measure the local and/or global effects on the environment, on people, and social and economic values with the use of individually determined criteria. It is emphasized that to determine the degree of sustainability of real estate, various certification systems have been developed over the last few decades, with BREEAM, LEED, and the DGNB currently being the most relevant for the market.*

Keywords: *sustainability, large companies, certification, BREEAM, LEED, DGNB, types of certification.*

JEL Classification: *Q56, G22*

1 Introduction

According to current estimates, around a third more people will be living on earth in 40 years. This presents mankind with phenomenally high challenges, as the resources for the life on earth are known to be limited.

The past has shown that population and economic growth, industrialization, urbanization, increasing prosperity with increased demand for living space as well as increasing demands on quality and comfort make non-renewable raw materials more widely used. The direct and indirect consequences of climate change with drastic meteorological changes require a permanent discussion about the further handling of our resources.

According to this background, sustainability is becoming more and more an issue – besides in large companies and is one of the megatrends in the real estate industry. In particular, high energy costs will increase the importance of sustainability measures in the next few years. According to many publications, real estate is responsible for 40% of energy consumption, 30% of raw material consumption, and 40% of greenhouse gas emissions in Germany alone.

On the one hand, real estate contributes to general prosperity, on the other hand, it also represents a significant environmental burden. Concepts that guarantee prosperity and at the same time keep the environmental impact low through sustainable development are a suitable solution to the problem. Planning and developing buildings based on requirements, using them efficiently, and dismantling them in an environmentally friendly way are essential elements of the property-related sustainability strategy. The basic idea is to increase the utility value of the property while at the same time reducing its impact on the environment, considering the entire life cycle of the building from construction to operation and dismantling of the complex.

The aim of the present work is to compare basic types of certification (BREEAM, LEED, and the DGNB) in office buildings.

2 Methodology

The study is mainly based on theoretical methods of research. Comparative analysis was used to find out similarities and differences among BREEAM, LEED, and the DGNB. Structural analysis was conducted to find out the specific details of each certification system. Synthesis, induction, deduction was also used.

3 Results

Various criteria are considered below and are used for the classic evaluation of a property. Those factors that are relevant for the users of a building when evaluating a workplace are also examined.

Dealing with the subject of sustainability is comparable to the subject of facility management, in which many content-related details are described, but the exact feasibility often remains unclear.

In forestry, for example, sustainability has been a clearly formulated goal since the 18th century. In 1713, Hanns Carl von Carlowitz defined sustainability as the management method of forests in which only as much wood is removed as can grow back. The aim was and is to preserve the forest's ability to regenerate. Almost three hundred years later, in 1987, the term "sustainability"

was presented for the first time in the report of the UN World Commission on Environment and Development "Our Common Future", chaired by Gro Harlem Brundtland (Hegger, 2008). Sustainability is defined here as "sustainable development meets the needs of the present without compromising the ability of future generations to meet their own needs".

The Commission understands sustainable development as a means with the help of which the present generation can meet their needs without jeopardizing the possibilities of future generations.

This section describes how the general concept of sustainability can be applied to the real estate industry. The international certification systems such as LEED, BREEAM, or the German Sustainable Building Certificate (DGNB) build on these basic considerations and evaluate the sustainability of the property using various criteria in three pillars.

The aim of the ecological pillar is to protect resources and the ecosystem. This pillar concerns land, energy, and water consumption and real, local, and global effects with the least possible negative impact on the natural balance. It is important to reduce pollutant emissions, especially CO2 emissions from the property, to curb the destruction of the ozone layer and the greenhouse effect. The overall energy requirement of a building should be minimized over the entire life cycle using this model. Besides, the focus is on improving the recyclability of the materials used, both in the construction of the building, through its period of use, and to its complete dismantling.

The economic pillar focuses on the profitability of a building. The objectives are to optimize the construction costs, the costs during the use of the building, and the maintenance costs. This includes energy, electricity cleaning costs, ease of maintenance and repair, maintenance cycles, and long-term maximization of resource productivity. The stable value of a property is another factor influencing economic sustainability.

The third socio-cultural pillar of sustainability is the preservation of social and cultural values and the protection of health as well as a high degree of comfort for the users. Areas such as user satisfaction, optimization of working conditions, design preservation aspects as well as the preservation of knowledge are a part of this. The thermal, acoustic, and visual comfort is of great value to the users of the property. This transforms into an economic advantage since employee costs make up around 80% of the total costs of a company. Increased well-being in the building is reflected in an increase in productivity and offers considerable savings potential, including the reduction of expensive absenteeism by users.

In recent years, regional, national and international certification systems have been developed. They take into account different aspects of sustainable and energy-saving construction. They serve on the one hand as evidence that the defined properties have been achieved and on the other hand as a guide for planning and execution. Internationally, the English-language certification systems from Great Britain, Building Research Establishment's Environmental Assessment Method (BREEAM), and from the USA, Leadership in Environmental and Energy Design (LEED), are used. In an international comparison, the German Sustainable Building Certificate is one of the most recent certification systems alongside the ones described above.

With a sustainability certificate, also known as the Green Building Label, the contribution that the building makes to sustainable development is described, assessed, and presented.

"Certification" is understood to mean the act of an impartial third party, the so-called auditor, to check operational processes or products for compliance with clear criteria. On behalf of the client, an auditor accompanies a construction project on the way to the certificate – ideally from the beginning of planning to completion.

The auditor forms the content-related and organizational bridge between the certification and the project that is to be certified.

The basic aim of all certification systems is to evaluate and measure the local and/or global effects on the environment, on people, and on social and economic values using individually determined criteria. On this basis, certain requirements are placed on the buildings and their surroundings using appropriate characteristics that describe the effects and make them measurable.

BREEAM has been running in Great Britain since 1990. Green Building Council launched the BREEAM certification system.

BREEAM originally recorded the phases from planning through execution to completion and ignored both use and dismantling. An amendment was made in 2008, according to which now the entire life cycle is taken into account.

The BREEAM certificate is valid for one year and must be renewed annually to maintain the award level.

With BREEAM, all types of buildings can be assessed, from new buildings to existing ones.

It is based on a scoring model that awards points (credits) when environmental, health, and

Figure 1 BREEAM certification level depending on the overall fulfillment of the characteristics

management criteria are met. Certain target values must be achieved.

The following figure shows the four different degrees of certification, the achievement of which depends on the degree of overall fulfillment of the assessment criteria.

The assessment according to BREEAM takes place in three parts (building, operation and dismantling) with around 180 criteria that represent the categories already mentioned.

The properties are rated on a scale from "passed" to "good" and "very good" to "excellent" and achieve a corresponding certificate. Low standards with a degree of fulfillment of less than 25% are excluded from certification.

BREEAM primarily takes into account the ecological quality of the buildings and measures aspects such as health and comfort, environmental pollution, the planning, and construction process. The life cycle is also considered, but the results achieved have only a minor influence on the overall assessment.

A point system is used to evaluate the individual criteria as more or less "important". An initial classification of the property can be made with the weightings, proportions, and maximum achievable points. BREEAM can be used in the following areas:

– Refurbishment and new construction
– Wide range of building types such as offices, public buildings
– Industry
– Residential houses

In the USA, the US Green Building Council (USGBC) launched the "Leadership in Environmental and Energy Design" certification system, or LEED for short, in 1993 as part of a pilot project. Today it is used in around 80 countries and has been continuously developed and adapted to changing market conditions since its introduction.

LEED is the first US rating system that offers a complex evaluation of energy and water consumption, connection to the local infrastructure (transport links, waste/wastewater disposal), resource protection, space consumption, and indoor air quality as well as innovation and design of the commercial real estate.

From a simple standard for new buildings in 1994 to a complex valuation procedure, the system was expanded by 2009 and now it offers many application modules for the entire life cycle of real estate.

In June 2011, over 23,000 commercial properties were registered with the USGBC for certification.

Similar to the British BREEAM, the American LEED certification is the result of a scoring process in which points are earned by fulfilling specified criteria and achieving defined benchmarks.

The American LEED standard is used in particular to classify "Green Buildings", i.e. the ecological quality of the building is the focus of certification.

Depending on the degree of fulfillment achieved, credit points are awarded, with 100 points being the maximum rating that can be achieved.

The corresponding certification level achieved is shown in the following Figure 2.

It was not until 2007 that a certification system (DGNB certification) was developed in Germany in cooperation between the DGNB (German Sustainable Building Council) and the Federal Ministry for Transport, Building and Urban Development (BMVBS) in order to assess the degree of sustainability of the buildings.

The DGNB now has around 1,100 members from all areas of the planning, construction, and real estate industry, besides from municipalities, universities, and associations.

With currently 1232 registered and certified projects, it is the most widely used rating system for real estate in Germany.

A distinction is made between new buildings and existing buildings.

Figure 2 Certification levels depending on the number of points to be achieved in LEED

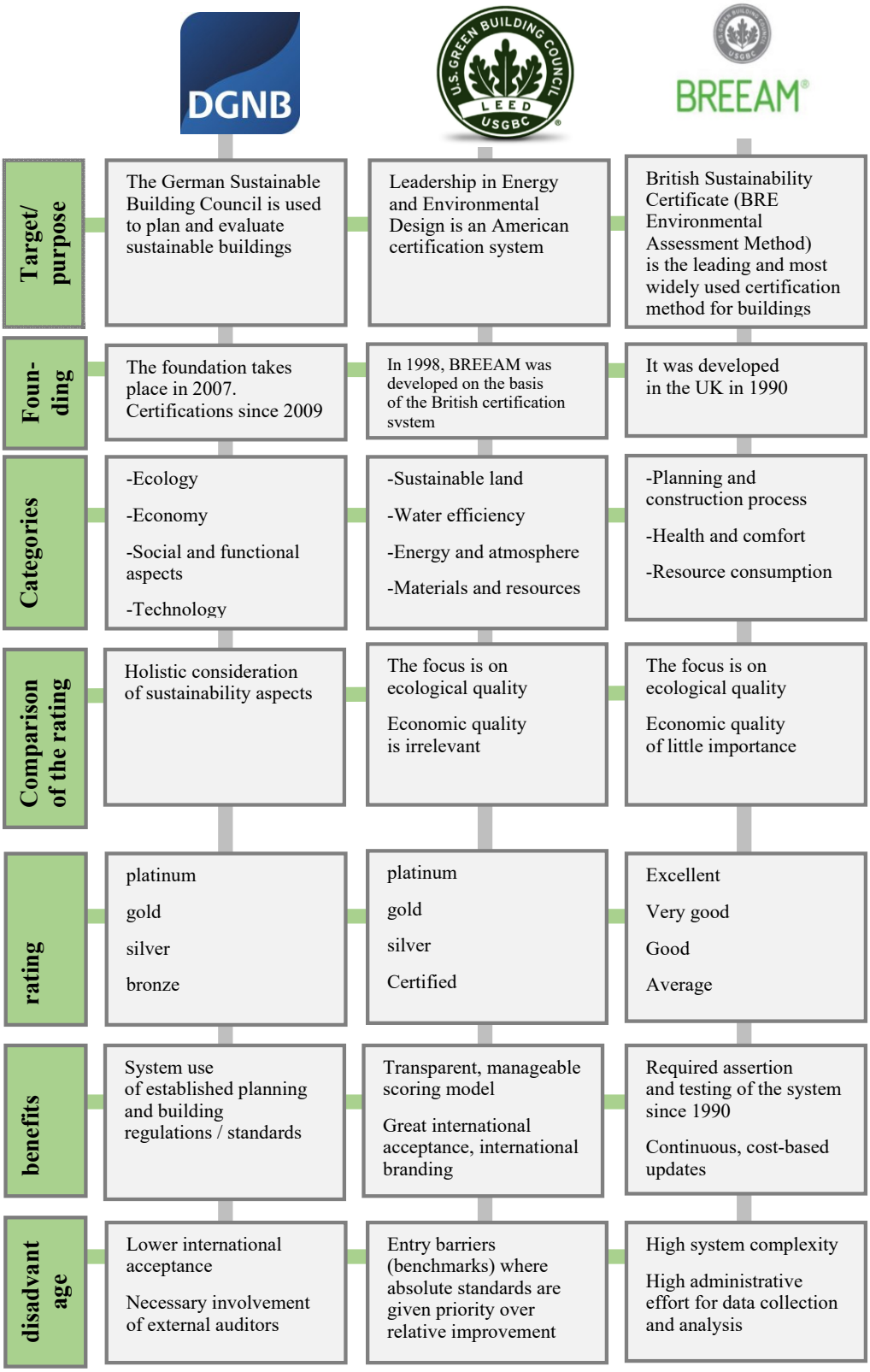

Figure 3 The comparative scheme of three types of certification

4 Conclusion

The world is in a state of changes associated with significant environmental issues. Energy transition, nuclear phase-out, climate legislation – sustainability is transforming from a trending topic to the epitome of structural changes. It is mentioned in the paper that real estate is responsible for 40% of energy consumption, 30% of raw material

consumption, and 40% of greenhouse gas emissions in Germany alone.

In order to determine the degree of sustainability of real estate, various certification systems have been developed over the last few decades, with BREEAM, LEED, and the DGNB currently being the most relevant for the market. BREEAM primarily takes into account the ecological quality of the buildings and measures aspects such as health and comfort, environmental pollution, the planning, and construction process. The American LEED certification is the result of a scoring process in which points are earned by fulfilling specified criteria and achieving defined benchmarks. DGNB certification is the first certification system of the second generation. The assessment basis is not just the ecology, but the complex consideration of the entire life cycle of a building.

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