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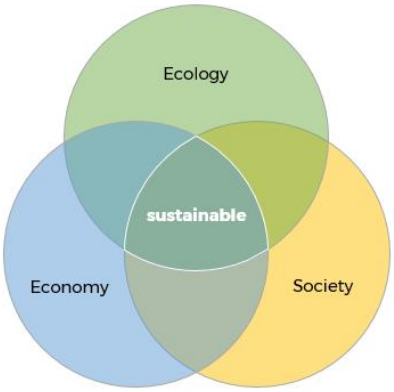
OF COURSE, A PASSIVHAUS IS SUSTAINABLE!

Speech by Thilo Cunz, WSP Deutschland AG, at 24th Passive House Conference 2020, September 24th

SUSTAINABILITY

The need to 'conserve the natural regenerative capacity of all systems involved', as sustainability is defined in Wikipedia, is currently the most important overall challenge we have to take up. In this sense sustainability fundamentally is the maximum overlap of ecological, economic and social aspects in our daily activities. Particularly in times of COVID-19 we see that a social disaster as the pandemic is directly linked to its economic consequences and cannot interrupt our environmental awareness on climate change. The necessary and possible sustainable action is so manifold that each person or company needs to have a clear strategy what to focus on. The UN Sustainable Development Goals for 2030 are one example how the definition of abstract targets might lead to precise action.

INTERPRETATION AND DEFINITION



SETTING OF INDIVIDUAL TARGETS

UN SUSTAINABLE DEVELOPMENT GOALS 2030

Address direct points of contact

1. No poverty
2. Zero hunger
3. Good health and well-being
4. Quality education
5. Gender equality
6. Clean water and sanitation
7. Affordable and clean energy
8. Decent work and economic growth
9. Industry, innovation and infrastructure
10. Reduced inequalities
11. Sustainable cities and communities
12. Responsible consumption and production
13. Climate action
14. Life below water
15. Life on land
16. Peace, justice and strong institutions
17. Partnerships for the goals

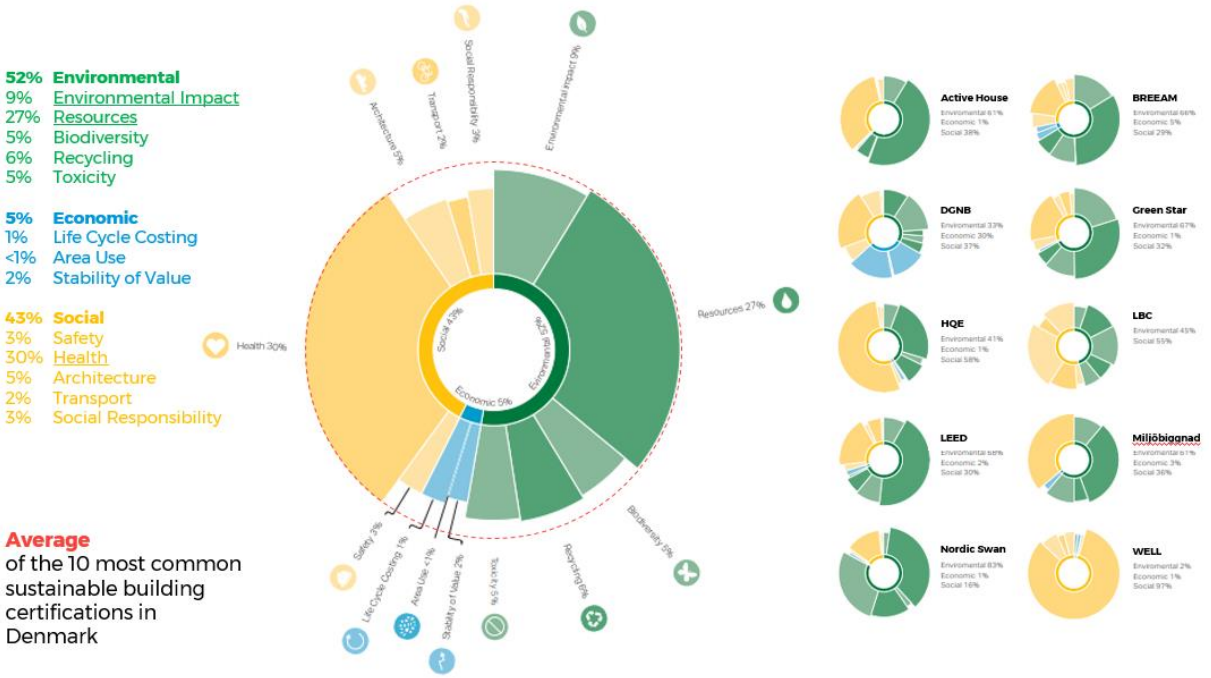
SUSTAINABLE BUILDING CERTIFICATIONS

In 2018 the Danish institute GXN published a very interesting study on Sustainable Building Certifications, based on an earlier report from SBI. They presented a selection of 45 global certification systems and highlighted the ten most common in Denmark. The comparison is very illustrative and self-explanatory. But, as in other studies on Sustainable Buildings, the Passivhaus concept is missing. That's how I came to the topic of my presentation at the 24th International Passive

House Conference, held online on September 24th, 2020: What is the sustainability level of a Passivhaus compared to other labels?

AVERAGE FOCUS

The study compares 10 certification systems based on the structure of the European Norm for Sustainable Buildings, DIN EN 15643, with 13 aspects in 3 categories. In average most labels focus on environmental and social aspects, on economic very little. Elder labels like BREEAM or LEED started as Green Buildings in the 1990th with nearly two thirds of their focus on environment, HQE as Healthy Building with more than half on social aspects and WELL as one of the latest with total focus on health. Only DGNB tries to focus evenly on all 3 columns of sustainability. The study compares just the internal spread of single labels. It describes their focus on those 13 aspects, without any weighting among each other.



http://www.dk-gbc.dk/nyheder/seneste-nyt/brand-new-guide-to-sustainable-building-certifications/

METHOD STUDY

What was the methodology to compare these really diverse certification systems? The institutes listed all criteria of the selected labels and decided for each of them, how the internal weighting had to be distributed to the 13 European Norm criteria. In this way it was possible to compare the labels on a common meta-level. It is not a detailed scientific valuing, but it gives a very clear general overview.

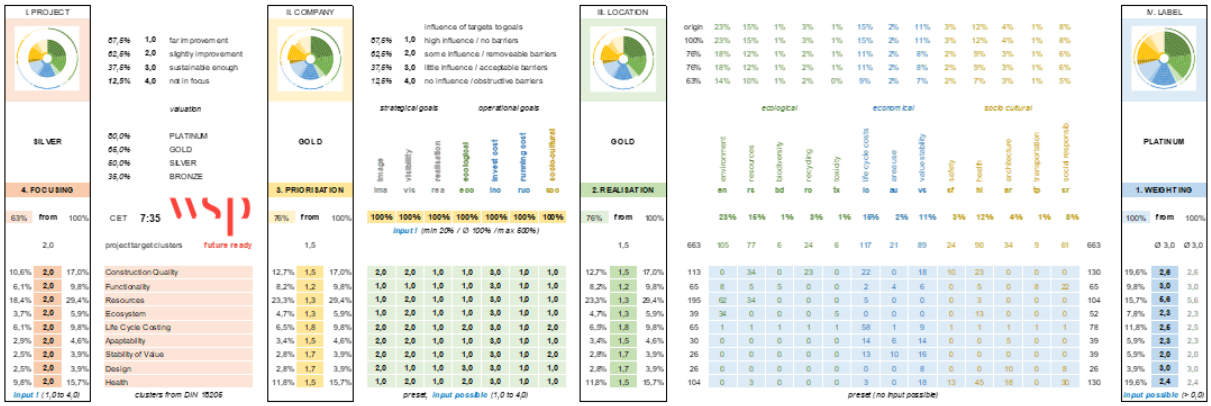
METHOD ADVANCEMENT

We improved the list of topics from BREEAM, LEED, DGNB and WELL by overlaying our own structure with 52 criteria in 15 clusters for our practical use. We further added 3 columns, one for the general weighting of our client´s interests, one for the valuing of importance in a specific project and one to

define our own spread of sustainability focus as result of previous weighting and valuing, in this case for a Passivhaus project.

CUSTOMER SUSTAINABILITY WORKSHOP

More and more of our clients ask how to reduce their environmental impact through construction. Together we perform a workshop in early project phases to define their general project targets. In four steps we 1. develop their company internal sustainability focus (weighting), 2. evaluate the potential of the specific site (realisation), 3. prioritize the strategical decision-making process (prioritisation) and 4. define the specific project targets (focusing). Usually the sustainability potential is reduced step by step from 100% in the weighting phase down to around 70% or less in the real project. This demonstrates, that intention and reality still differ a lot.



4. Focusing

Valuation of project relevant target clusters

3. Prioritisation

Prioritisation of company relevant decisions

2. Realisation

Valuation of location relevant decisions

1. Weighting

Weighting of label relevant target clusters

MAXIMUM SUSTAINABILITY

At the beginning I defined the maximum sustainability as the maximum overlap of environmental, economic and socio-cultural aspects. The more topics we evenly include from all three columns, the more sustainable our construction project will be. It is hardly possible to define the content of this maximum. But if we work on selected labels, like they did in the mentioned study, the maximum is the total of all topics they addressed. A 100% sustainable building is well payable, well acceptable and well feasible because it respects environmental, economic and socio-cultural aspects very extensively and on a balanced level.

LABEL AVERAGE

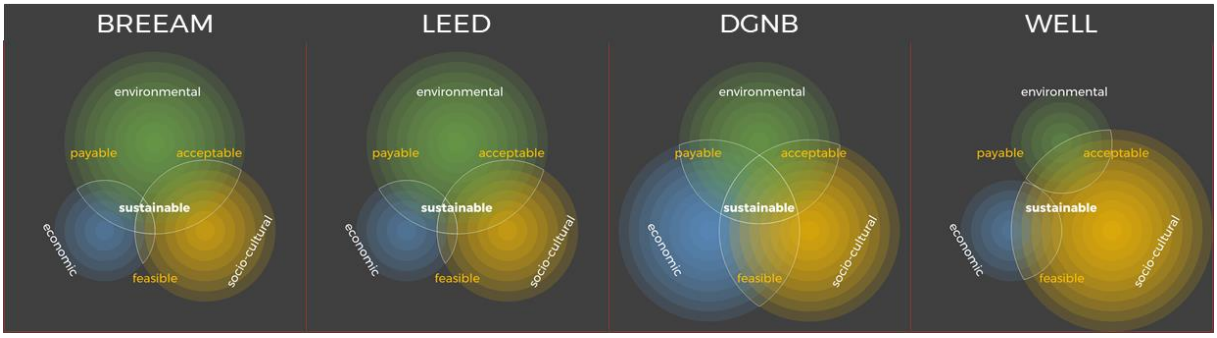
As the topics addressed are different from label to label, the average is always less than the maximum. In the Danish study the main focus in average is on health, resources and environmental impact. Around 80% of all criteria overlaid by us are present from environmental and social aspects, but significantly less than 50% from economic. The average of the evaluated labels is more a healthy green building, largely payable, well acceptable and largely feasible - in case the highest scores have been achieved. In the spirit of this study also we did not evaluate the percentages scientifically, it's just a rough estimation out of the available data to visualize our considerations.

BREEAM

BREEAM was established in the UK with main focus on resources, environmental impact and health. Around 90% of environmental topics are addressed, 70% of social and far less than 50% of economic. A highly scored BREEAM certificate describes a healthy, very green building, payable, well acceptable and largely feasible.

LEED

LEED was established in the US with main focus on resources, health and environmental impact. Around 90% of environmental topics are addressed, 70% of social and far less than 50% of economic. A highly scored LEED certificate describes a healthy, very green building, payable, well acceptable and largely feasible.



DGNB

DGNB was established in Germany with main focus on health, value stability and resources. Around 80% of environmental topics are addressed, 90% of social and economic as well. A highly scored DGNB certificate describes a very sustainable building, well payable, well acceptable and well feasible.

WELL

WELL was established in the US with main focus on health. More than 100% of social topics are addressed, primary from the health area, but significantly less than 50% of environmental and economic. A highly scored WELL certificate describes a very healthy building, hardly payable, acceptable, feasible - but without combination with other labels not sustainable.

PASSIVHAUS (PH)

The Passivhaus was established in Germany with main focus on resources, health and cost. As the energy performance is relevant for the certification only, values for other categories had to be determined, using our 4-stage instrument I presented before. Around 80% of environmental topics are addressed even if they are not directly included into the certification process, 70% of social and 50% of economic. A Passivhaus certificate describes a healthy green building, largely payable, acceptable and largely feasible.

BUILDTOG PH BREMEN

In most of the Passivhaus projects I´ve been involved in many additional topics have been addressed on top of those necessary for the certification. The BuildTog Passivhaus from GEWOBA was completed in Bremen, Germany, with main focus on health, resources and life-cycle-cost. Around 80% of environmental topics are addressed, 80% of social and 60% of economic. The Passivhaus certification describes a quite sustainable building, payable, well acceptable and feasible.

BUILDING TOGETHER (BUILDTOG)

Let me describe the background of this project. Building Together, was a European Passivhaus workshop, performed between 2009 and 2017 by Eurhonet, a network of around 30 housing companies from Sweden, UK, France, Germany and Italy. They met 3 times a year to be prepared for the EU CO2 saving targets from 2020 on. With support from design and sustainability experts they developed the Common Design for an apartment house, with high energy performance, attractive architecture and affordable costs. The concept was adapted to 7 local sites in different countries with around 200 apartments. I already talked about these projects at the Passivhaus conferences in 2013 and 2017. In Germany 3 BuildTogs were realised, one of them in Bremen. Besides the necessary elements to achieve the Passivhaus certification many of the topics listed in the compared labels have been addressed in Bremen on top. I will highlight some of them.

BUILDTOG PH BREMEN / ENVIRONMENTAL

From environmental perspective the local site was respected very well. The building is a reconstruction in a developed and well accepted area. The whole district benefits from the restructuring. The average heat consumption is far less than expected. The flooring is wooden and window sills are made of natural stone. The project is attended by Passivhaus Institut with a comprehensive scientific 3-year monitoring. A mobility concept was developed with public transportation, enough space for bicycles and e-car-sharing.

BUILDTOG PH BREMEN / ECONOMIC

From economic perspective all details have been developed very reliably from an experienced Passivhaus architect as resilient construction in a popular residential area with necessary infrastructure. All decisions have been taken from a life-cycle-perspective based on a complex

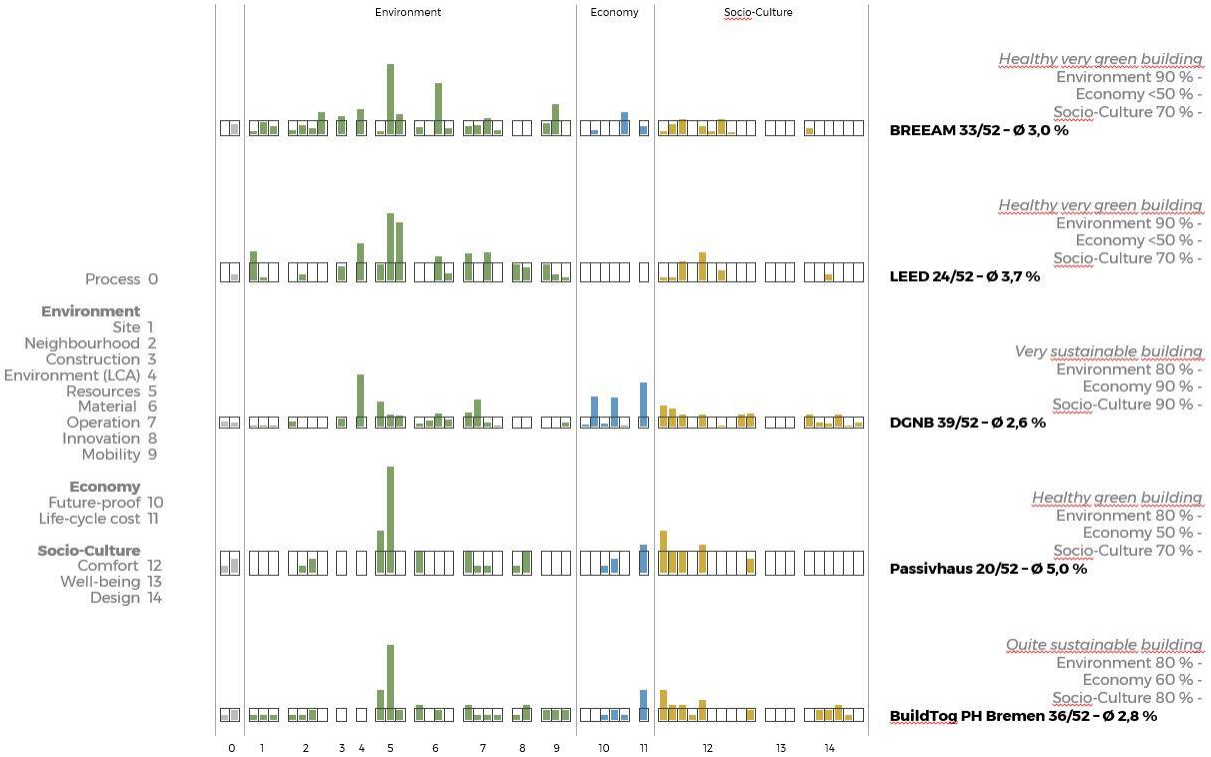
Visualization of Financial Implications (VoFI). The responsible project manager was part of the BuildTog Workshop and trained in the meetings from the beginning of the project on.

BUILDTOG PH BREMEN / SOCIAL

From social perspective the anyway high comfort was improved with sound-proof windows, glare-free blinds, large balconies, roof integrated PV and an intensive process to ensure the architectural quality. Drinking water quality is tested regularly and every year a post occupancy survey asks for user satisfaction.

GENERAL FOCUS

If we compare the general focus of the single topics from BREEAM, LEED, DGNB, PASSIVHAUS and BuildTog PH in Bremen based on our overlaid structure of 52 criteria in 15 clusters, we see that some labels have a wider view and others are more focused on one. DGNB addresses 39 of the 52 criteria, BREEAM and the BuildTog PH in Bremen 33 or 36, LEED and PASSIVHAUS 24 or 20.



SPECIFIC FOCUS

If we just compare the specific focus of those topics that influence their label on average level or above we see with BREEAM only 14 of 33 criteria count for 75% of the credits, with LEED 12 of 24 for 58%, with DGNB 19 of 39 for 85%, with PASSIVHAUS 10 of 20 for 77% and with BuildTog PH Bremen 22 of 36 for 85%. They all have some main criteria and circulate around the same clusters, mostly resources and comfort, but with various focus. It is hard to say which label is more sustainable or less, but none of them is not sustainable at all.

CRITERIA OVERLAP

If we finally just compare the criteria overlap we see 76% of all BREEAM topics are addressed with BuildTog PH Bremen as well, 70% from LEED, 70% from DGNB and, of course, 100% from the standard PASSIVHAUS. On the other hand, the topics from Bremen are addressed by BREEAM with 77%, by LEED with 52%, by DGNB with 87% and by the standard PASSIVHAUS with 72%.

For the BuildTog PH in Bremen this could mean:

- The focus is similarly comprehensive as with BREEAM.
- The focus is wider than with LEED.
- The focus direction is similar to DGNB but a little less.
- The focus is nearly 50% wider than with the standard PASSIVHAUS which might give an idea of the additional sustainability potential in PASSIVHAUS projects.

CONCLUSION

Of course - a certified Passivhaus is basically sustainable.
Usually - with additional focus it is even more.
Specifically - the BuildTog Passivhaus from GEWOBA in Bremen is quite sustainable.

Any certified Passivhaus is sustainable. But its sustainability is not certified.