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## Green buildings in Thailand only a drop in the ocean?

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Many people in Thailand and South-East Asia know the numbers – the construction industry is responsible for 40 per cent of the worldwide energy consumption, 30 per cent of the resource use and 30 per cent of the carbon emissions. However, buildings not only have a large impact on the environment; they can also have a negative effect on the health and well-being of building occupants – the lack of thermal, visual and acoustic comfort can lead to an unpleasant indoor environment and, in the long term, health issues such as, for example, sick building syndrome. Not only that, but buildings also reflect a country's cultural heritage and lifestyle.

In Thailand, we can observe the impact of decades of a profit-driven construction industry that rates quantity over quality: a mismanaged urban development that prioritizes cars above people, buildings with skyrocketing energy bills and complaints by building occupants about low indoor air quality as well as a lack of thermal comfort to name just a few negative aspects.

Growing concerns about the abovementioned issues have led to the introduction of green buildings on the Thai real estate market. Third-party green building rating systems usually define the green performance of such buildings. The two market leaders in Thailand are LEED (from the United States) and TREES – a localized Thai version of LEED. Both cover dozens of criteria under several main topics such as the environment, water, materials, indoor environment, site, regional priority and innovation.

Other systems have a different emphasis. The international version of the DGNB system (Germany) systematically groups the criteria under the three main pillars of sustainability: environmental; human; and economic quality. The economic quality is mainly covered through a life-cycle cost approach to make sustainable buildings affordable, and is one of the main differences compared to the above-mentioned systems.

On the other hand, the WELL system (from the United States) focuses entirely on human well-being and health issues, and is therefore often paired with a TREES or LEED certification. Due to the many topics addressed during the certification process, green building certification systems are tending to become more complex and challenging to implement. A system that tries to simplify certification is EDGE, which only focuses on energy and water consumption as well as materials (grey energy). The development of the system was supported by the International Finance Corporation (IFC) and is mainly focused on smaller residential buildings, but neglects human health and well-being.

An aspect that green building certification systems have in common is that they are voluntary and require additional consulting from a specialized company or person. The certification process should start during the pre-design phase by conducting a preassessment, defining the certification goals, and shouldbe continued during the design development and tendering. Even during construction and commissioning, the green building consultant stays with the project and conducts regular quality checks regarding the green performance of a project.

After finishing the building, the certification documentation is sent by the green building consultant to the certification body, and – if successful – the building will be granted an award (depending on the certification system: certified, bronze, silver, gold, platinum etc.). This is usually the main motivation for real estate developers who, in the past, tried to build cheap and sell pricy. Such a lack of long-term thinking led to the consequences of unsatisfied costumers and bad reputation. Now they have a tool to increase the quality of their buildings and prove it by a third party. Typically, this comes at a higher price for the additional consulting and construction costs. Depending on the normal construction standard of a developer and the achieved certification level, the additional costs range between 3 per cent and 20 per cent of the baseline construction costs. Research studies conducted by the World Green Building Council show that the additional costs are usually reimbursed within a few years due to lower energy, water and maintenance bills, a lower

sickness rate and higher working efficiency of the building occupants.

## *cc* Thailand's green building movement mainly addresses new buildings, even though all certification systems provide an option for renovation projects. *\*\**

So far, a total of 214 buildings in Thailand have been certified according to LEED, 75 buildings according to TREES and five buildings according to DGNB as well as one project according to WELL and three buildings according to EDGE. Many more projects are currently in the certification process. Thanks to the green building movement, a lively market for energy efficiency technologies, green products and services has been established.

To tackle the problem of the environmental impact of buildings on a broader basis, the mandatory Building Energy Code (BEC) was introduced in Thailand in 2021. Since then, all new construction projects with a gross floor area greater than 5,000 m 2 need to fulfill – during the Environmental Impact Assessment (EIA) – the pre-defined requirements regarding shading, glazing, thermal insulation, lighting energy efficiency and air-conditioning equipment. However, the gross floor area requirement will be reduced to greater than 2,000 m 2 in 2023 to increase coverage of the number of concerned buildings. The minimum requirements regarding energy efficiency are relatively low in order to make it feasible for average-sized construction projects. So far, more than 5,000 buildings in Thailand have been approved or are currently in the approval process (see the ONEP webpage).



Comparison of the topics in green building certification systems. EGS-plan (Bangkok) Co., Ltd.

With some exceptions, Thailand's green building movement mainly addresses new buildings, even though all certification systems provide an option for renovation projects. Studies show that the ratio between new and existing buildings is only between 3 per cent and 5 per cent per year. These old buildings typically have higher energy consumption and poor human comfort. In terms of environmental and economic impact, it would be much more environmentallyfriendly and economical to reuse the concrete structure of these buildings and renovate them more sustainably rather than tear them down and rebuild them. Here, awareness on behalf of the building owner and planner is required to leverage this potential with new technologies and renovation strategies.

To sum up, green buildings are currently only a drop in the ocean, with the focus mainly on prestigious new high-rise projects in Bangkok. This becomes especially obvious when considering the huge renovation potential of existing buildings. However, green buildings play an important role when it comes to the development of innovative building concepts, products and technologies.

These new building concepts and technologies might trickle down to "normal" new building projects, and hopefully will also have an impact on the renovation of existing buildings. Yet, while increasing energy costs and user requests for comfortable living and working spaces will lead to a higher demand for sustainable and green buildings – certified or not, the question is will these innovations come fast enough to help stop global warming?

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