

Analysis and evaluation of energy concept variants with regard to international sustainability principles and local Chinese practice using the example of a well-being and future-oriented office building

As the world's largest energy consumer, China is an important participant in dealing with global climate change. So far, the country still heavily relies on coal use, thus carbon emissions are rising continuously. In the ongoing transition to a sustainable development, international building projects and regulations serve as a model and stimulate the government's efforts to build green buildings and publish laws for energy-efficient systems. This work analyzes the synergies and differences within the preferences of international stakeholders in the planning process of a building and outlines the implementation of international and domestic sustainability regulations in the construction progress in China. Sustainable design principles and practical realization are expected to differ, especially when applied in an international context. This work examines the planning of an advanced energy-efficient building in context of international principles and the Chinese practice, in order to interpret the role of international building projects in the current transition towards a sustainable, environmental-friendly building industry, while satisfying local building owners and users' needs.

International stakeholders of a newly planned future-oriented office building in Shanghai are interviewed to reveal their preferences and objectives in the planning progress in China. The factors comfort, energy-efficiency and environmental impact, costs, technical complexity and architectural design are rated by the interviewees and further used to create a synoptic evaluation matrix to compare three energy concept variants. In comparison of a basic variant according to the design brief, an optimized variant 1 that is common standard in China and a more innovative, energy-efficient variant 2, the client selected variant 1 for the new building. His decision can be related to the ongoing transition in China. The stakeholders have high ambitions to plan a sustainable, user-friendly building system, but in the end realize the optimized standard system rather than the energy saving, high-comfort variant.

China recently published ambitious sustainability regulations and the interests of stakeholders are moving towards these principles, but implementation in the planning process is not fully realized. Quick payback of the investment, the tight schedule for building projects, low price of energy and insufficient awareness of building owners are still obstacles for sustainable building systems in China. Future improvement approaches suggest to expand the knowledge of local construction workers, spread green buildings nationwide, include a sustainability standard into the planning process and eliminate the discrepancy between planning and practical realization on construction site. International principles and standards serve as references, but must be adapted and contextualized to be implemented into the local planning process. Considering the ongoing transition and ambitious improvements, China will achieve to develop a more sustainable, environmental-friendly building industry in the future.