LESS in structure

Efficiencies in construction, technology and economy

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In general, the term "efficiency" describes the relationship between the means used and the results achieved. In structural engineering and construction, efficiency criteria are often used for purposes of optimization, for example, to build at a minimum of financial investment or as quickly as possible.

Due to the fact that the construction industry causes 40 % of global CO_2 emissions, the CO_2 efficiency of buildings and especially their structure is of particular importance. Engineering constructions with adequate materials, budgets or space efficiency is not necessarily in line with global CO_2 emission targets aimed at limiting global warming to 1.5 degrees. Thus, efficiency in structural terms requires a new definition in the context of climate change in order to play a central role for holistic approaches to architectural education.

The category "efficiency" welcomed papers that present new insights and approaches in line with this new concept of CO_2 efficiency in planning processes aimed at the optimization of structures and the construction of buildings.

Related and new approaches address the following questions:

- How can low-tech materials, related engineering skills and traditional craftsmanship contribute to building with regional materials and construction methods?
- How can structural capacities and quality requirements be achieved in the reuse of materials and building elements?
- How can we balance "heavyweight" and "lightweight" structures and, thus, the advantages and disadvantages of hybrid construction types?
- Which approaches are suitable to compare criteria of "high-tech" and "low-tech" building technologies?
- Which tools are suitable to compare and optimize the CO_2 footprint of buildings, their structures and their material characteristics?
- Which design criteria related to CO_2 (such as kg CO_2 e/m^2 or EUR/kg CO_2 e) are appropriate for new building projects?
- Is building nothing a better option than building something?