

Adaptable Buildings for More Sustainable Housing: Energy Life Cycle Analysis

Authors : Rafael Santos Fischer, Aloísio Leoni Schmid, Amanda Dalla-Bonna

Abstract : The life cycle analysis and the energy life cycle analysis are useful design support tools when sustainability becomes imperative. The final phase of buildings life cycle is probably the least known, on which less knowledge is available. In the Brazilian building industry, the lifespan of a building design rarely is treated as a definite design parameter. There is rather a common sense attitude to take any building demands as permanent, and to take for granted that buildings solutions are durable and solid. Housing, being a permanent issue in any society, presents a real challenge to the choice of a design lifespan. In Brazilian history, there was a contrast of the native solutions of collective, non-durable houses built by several nomadic tribes, and the stone and masonry buildings introduced by the sedentary Portuguese conquerors. Durable buildings are commonly associated with welfare. However, social dynamics makes traditional families of both parents and children be just one of several possible arrangements. In addition, a more liberal attitude towards family leads to an increase in the number of people living in alternative arrangements. Japan is an example of country where houses have been made intentionally ephemeral since the half of 20th century. The present article presents the development of a flexible housing design solution on the basis of the Design Science Research approach. A comparison in terms of energy life cycle shows how flexibility and dematerialization may point at a feasible future for housing policies in Brazil.

Keywords : adaptability, adaptable building, embodied energy, life cycle analysis, social housing

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