

RP1011

SUSTAINABLE AND AFFORDABLE LIVING THROUGH MODULAR, NET ZERO ENERGY, TRANSPORTABLE, AND SELF-RELIANT HOMES AND COMMUNITIES

Problem

The need for housing that is economically affordable as well as environmentally sustainable is a major issue globally. Prefabricated buildings are considered an attractive response to these challenges. For the Prefab industry, however, developing real housing solutions that address several competing forces, including quality of design and construction, weight and transport issues, integration of energy, water and waste systems, different site and climatic conditions, and many more in addition to cost and environmental concerns, is a challenging task.

For an existing prefab business, such as Nova Deko, the need to improve existing designs before new ones with full sustainability potential can be developed adds an additional layer of complexity to this challenge.

Figure 1 - A rendering of an existing Pod design



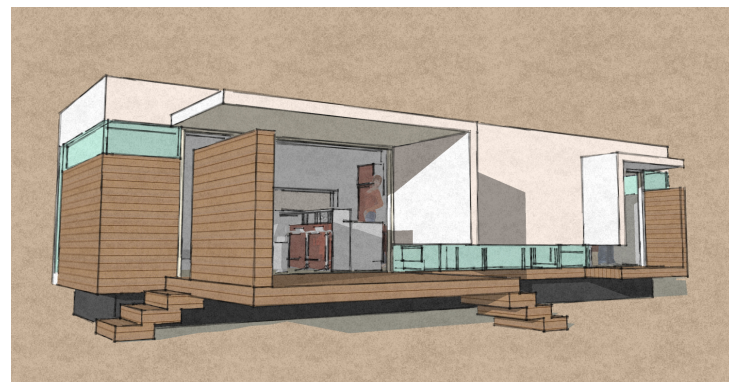
Solution

A Whole Systems Design approach to prefab buildings appears to offer great opportunities in tackling these challenges. It is an approach to sustainable design that employs integrative design and systems thinking for optimising not just parts but the entire system. My role in the multidisciplinary research team has been to apply this approach to the design of not only the building - the end product - but also the entire building system that leads to that end product.

This is at present a work in progress. The team has so far addressed issues of existing designs and developed improved solutions and the conceptPod that are currently being integrated by Nova Deko. My PhD research goes further

as it is aimed at developing a whole systems design decision making framework that can also contribute to the project by assisting in developing high performance sustainable and affordable prefab housing solutions.

Figure 2 - A rendering of a conceptPod design



Developing a framework for whole systems design for sustainable affordable prefabricated housing

Benefits

The outcome of my research, in the form of a decision making framework, would have a practical benefit for the prefab housing industry specifically but also for the building industry and customers of these industries generally. It would also contribute to the fields of research and practice of sustainability by clarifying the nature of relationship between sustainability and affordability in prefab housing and how whole systems design can influence them both.

If you work in this area, know someone who does, or are simply curious about this research, then there may be opportunities to contribute and collaborate. Let us talk.

Contact

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