

RP1011

SUSTAINABLE AND AFFORDABLE LIVING THROUGH MODULAR HOMES & COMMUNITIES

Research Question

Provision of adequate and affordable housing is a major challenge in both emerging and established economies. With urgent need to address climate change these habitats need to be environmentally sustainable too. In this context, this research investigates the role of design and decision support in achieving high performance in prefabricated (prefab) housing.



Figure 1: Whole systems design's influence on sustainability & affordability in prefab housing

Methodology

This ongoing research has two broad stages and employs predominantly quantitative but also qualitative methods. The first stage, an international survey and data analysis, has concluded. It was designed to explore the makeup of the prefab housing industry and capture a snapshot of the industry's perceptions, key constraints and drivers.

The next stage involves targeted case studies and interviews to gather data on Sustainability, Affordability, Time, Scope and Design. It will answer research questions and help develop a framework for high performance in prefab housing.

Results

There were 43 valid responses from participants having wide diversity of roles and size of organisations from 27 different countries. An estimated 82% claimed that their prefab homes could be considered environmentally very sustainable while 71% claimed that their homes could be considered economically very affordable.

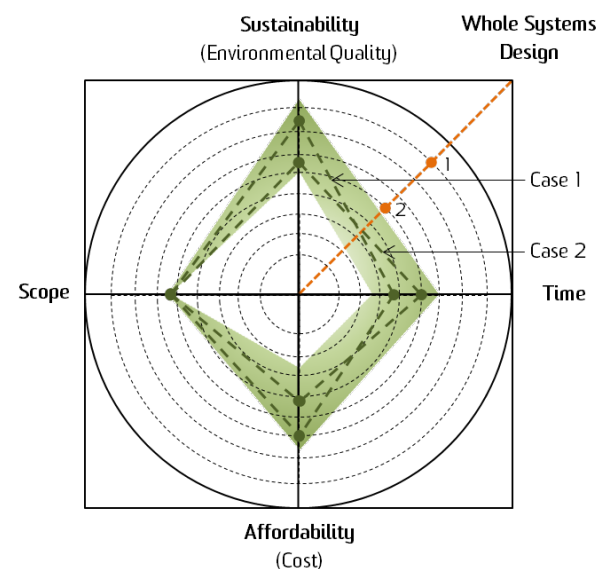


Figure 2: Analytical framework

The analysis of the findings revealed a peculiar relationship between sustainability and affordability. While both were considered very important, the high performing homes indicated an unmistakable perception that sustainability and affordability had inverse relationship. However, when the homes improved on affordability, to some extent, their sustainability improved too. Whether this indicates the case of co-benefit or simple divergence between affordability and sustainability, it calls for further investigation.

Conclusions

The reluctance or lack of awareness and training among Builders and Designers were found to be one of the biggest constraints while shorter schedules and higher thermal performance were among the top drivers for the uptake of prefab.

The findings highlighted a significant gap and the need for appropriate design and decision support frameworks that can aid in delivering high performance sustainable and affordable housing.

Anticipated impacts

Towards a Decision Support Framework for High Performance in Sustainability and Affordability in Prefab Housing

The outcome of this research is expected to benefit the prefab housing industry as well as the building industry in general. It will aid the industry in design decision making and in delivering more effective response to the pressing needs for housing by developing solutions for high performance low carbon and affordable housing.

Further information

<http://www.lowcarbonlivingcrc.com.au/research/program-1-integrated-building-systems/rp1011-sustainable-and-affordable-living-through>

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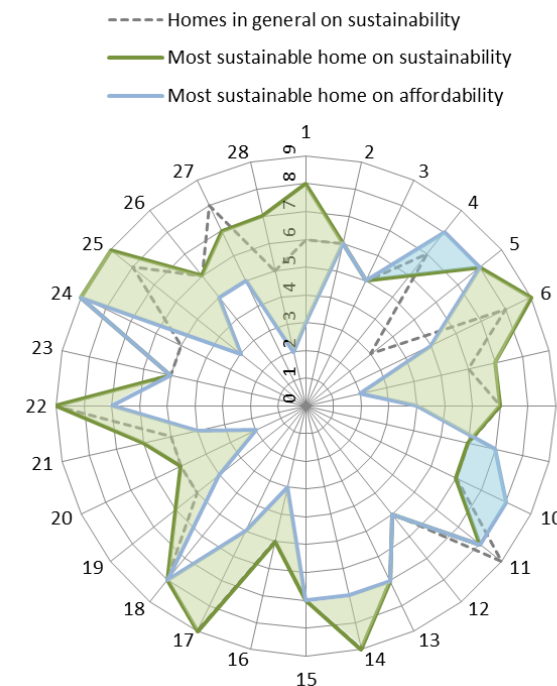


Figure 3: Respondents' perceptions on performance of their most sustainable homes

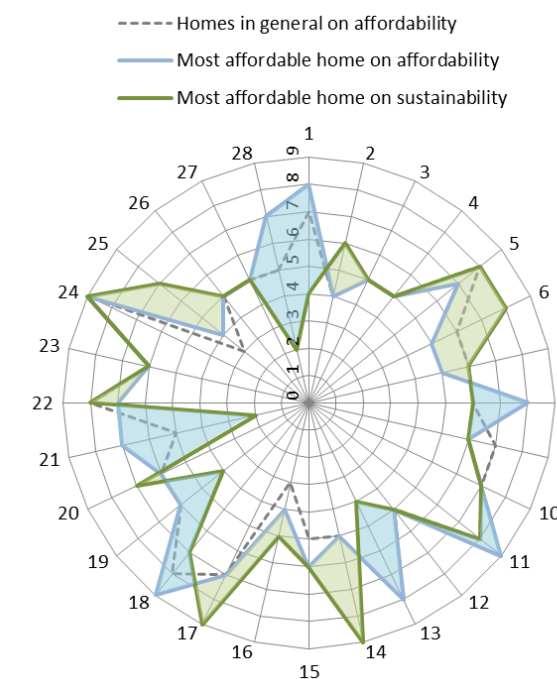


Figure 4: Respondents' perceptions on performance of their most affordable homes