

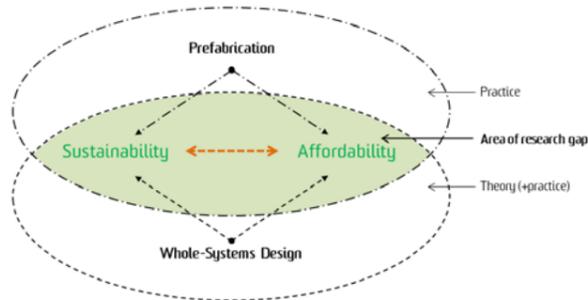
RP1011

SUSTAINABLE AND AFFORDABLE LIVING THROUGH MODULAR...

Research Question

The fundamental question this research is set out to address relates to some of the most pressing issues experienced not only in Australia but globally. It is about environmental sustainability and economic affordability in prefabricated housing and what role Whole Systems Design can play in developing high performance housing.

Figure 1: Area of research gap



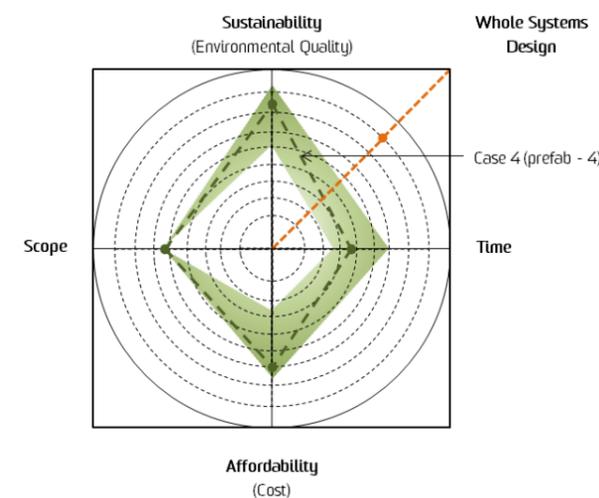
Methodology

This research employs a mixed methods approach. It is divided broadly in two stages: the first one employs a predominantly quantitative method through international online survey, while the second one employs both quantitative and qualitative methods through semi-structured interviews and short case studies. The research is still in progress; the survey in the first stage is just complete and the second stage is about to start.

The data gathered on the four key variable of Sustainability, Affordability, Scope, Time and Design will be used in a multi-criteria analysis to determine correlations and to understand the

nature of relationships between these variables. This will not only answer the key research question but also contribute to developing a decision-making framework.

Figure 2: Analytical framework



Results (225 words)

The research is currently ongoing and hence there are no final results. However, the responses to the international survey are just in and the compilation and analysis is currently being undertaken.

The preliminary outcome of this survey includes data and feedback from 59 prefab companies, associated professionals and industry experts.

Figure 3: Prefab building industry survey participants

| Role | Response percent | Response total |
|--|------------------|----------------|
| Manufacturer / Distributor | 44.9% | 22 |
| Designer (Architect / Engineer) | 53.06% | 26 |
| Project Manager | 26.53% | 13 |
| Builder / Subcontractor | 16.33% | 8 |
| Supplier of materials/products/components | 12.25% | 6 |
| Property Developer | 8.16% | 4 |
| Researcher / Academic / Adviser / Consultant | 14.29% | 7 |
| Owner / Occupant | 6.12% | 3 |
| Other (Please specify) | 2.04% | 1 |

Statistics based on 49 respondents

The data and findings include:

- Perception of drivers and barriers for prefabrication
- Type of prefabrication, share and spread of industry
- Type of production systems and materials used
- Size and type of dwellings and Time (onsite vs. offsite) required
- Perception and performance on
 - Sustainability (E)
 - Affordability (A)
 - Relationship between E & A
 - Design
- Decision support frameworks used and required by the industry

The preliminary results of the survey suggest a majority of the respondents are either not aware or don't use any decision support framework for strategic guidance on sustainability and/or affordability for prefab buildings. More than 70% of the respondents acknowledged that such a framework would be useful to extremely useful.

The next stage will gather hard data on key variables for feeding into the analytical framework and developing the decision-making framework.

Conclusions (50 words)

Since the research is currently ongoing there are no final results or conclusion. However, the findings of the research so far highlight the need for a decision-making framework that can be used by the prefab housing industry in developing high performance low carbon and cost-effective housing.

Anticipated impacts

Towards a Whole Systems Design Framework for High Performance in Sustainability and Affordability in Prefab Housing

The outcome of this research is expected to benefit specifically the prefab housing industry but also building industry in general. The outcome will aid the industry in multilevel decision making and in becoming more effective in responding to the pressing challenges around housing needs 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>

Contact

Malay Dave

Built Environment, UNSW AUSTRALIA

malay.dave@unsw.edu.au