

TEN HOUSE LIVING LABORATORY STUDY

Problem

Since 2012 all new residential homes in Australia are required to achieve a minimum of 6-Stars under the Nationwide House Energy Rating Scheme (NatHERS) framework. However NatHERS only relates to energy consumption for heating and cooling of conditioned spaces and is therefore limited in scope to capture broader household energy efficiency and overall household sustainability.

Furthermore, recent studies have shown that the move from 5 to 6 Stars has yielded limited energy savings potentials. One of the factors believed to be influencing this is occupant behaviour.

The energy performance of a home is equally affected by occupant behaviour as it is by its design.

Solution

This study aims to accomplish the following:

1. Decouple the impact of occupant behaviour from building design performance.
2. Employ two novel emerging sustainability tools to provide a broader description of household sustainability values.
3. Communicate the findings to a broad audience to raise awareness of the potential carbon and financial savings that can be achieved through simple household behaviour changes.

Figures 1-3: Water, power and gas meters used for household performance monitoring



Ten households will have their energy consumption monitored over a period of 2 years, subject to an educational intervention strategy at the start of Year 2. Energy audits and house sustainability assessments will also be conducted (Life Cycle Assessment and multi-criteria energy, water, materials, liveability assessment).

During the community engagement phase (Year 2), the householders' journey will be captured as part of the online Josh's House video series to communicate the findings to a national audience via www.joshshouse.com.au and associated social media activity.

Table 1: Selected houses profiles

Id	Class.	Occ.	Gas	Elect.	Water	Temp.	PV	RW	GW
C	Retrofit	4	•	•	•	•	•	○	○
E	Retrofit	2	•	•	•	•	•	•	○
F	DTS	4	•	•	•	•	•	•	○
L	6 Stars	4	•	•	•	•	○	○	○
M	6 Stars	5	•	•	•	•	•	•	○
O	6 Stars	2	•	•	•	•	•	•	○
P	6 Stars	2	•	•	•	•	○	○	○
G	7 Stars	3	•	•	•	•	•	•	○
B	8 Stars	3	•	•	•	•	•	•	•
H	8 Stars	4	•	•	•	•	•	•	•

Table 2: Project timeline

	2014	2015	2016
House recruitment	May - Aug		
Equipment installation	Aug - Nov		
Monitoring	Oct 2014 - Nov 2016		
House assessment	Sep - Dec		
Behaviour change intervention		Oct - Nov	
Audit		Oct - Nov	
Interviews			Aug
Key:	Complete	In progress	Scheduled

Benefits

This study will help develop a better understanding of what is required for an effective transition to a more sustainable housing future, benefiting the community in the following ways:

- Households - Improved awareness of available strategies for reducing home energy use and associated operational costs.
- Researchers - Better understanding of the impact of occupant behaviour as distinct from design in the performance of houses.
- Industry - Inform best areas for leadership and opportunities for community engagement.
- Government - Inform policy and initiatives.

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