MAINSTREAMING ZERO ENERGY HOUSING

PROJECT OVERVIEW

LOW CARBON LIVING CRC

BACKGROUND

Residential housing in Australia is recognised as a significant contributor of greenhouse gas (GHG) emissions, with the majority of emissions being generated during the operational phase of buildings. With around 100,000[1] houses built each year, and with the average operational GHG emissions in the order of 7 tonnes per dwelling[2], total emissions could be reduced by around 700,000 CO2-e per year if all new home were built as 'Zero Energy Homes'.[3] Simply put, Zero Energy Homes, (or Net Zero Energy Buildings), are designed and built to consume the same, or less, energy than they produce on an annual basis. Typically, ZEH buildings are highly energy efficient, through good design and quality construction, and include an appropriately sized roof-top solar power generation system to match their estimated power load during occupancy.

As Australia works towards meeting its carbon reduction target of zero emissions by 2050, the housing sector can play an important role in meeting this goal. Internationally the European Union and the State of California (USA) already have regulations in place to adopt ZEH for all newly constructed homes by 2020.[4,5] Meanwhile, Australia is still taking relatively early steps towards improving residential energy efficiency. This project aims to develop a better understanding of the construction cost implications and consumer interest of ZEH in Australia, whilst building industry support for ZEH homes amongst residential developers.

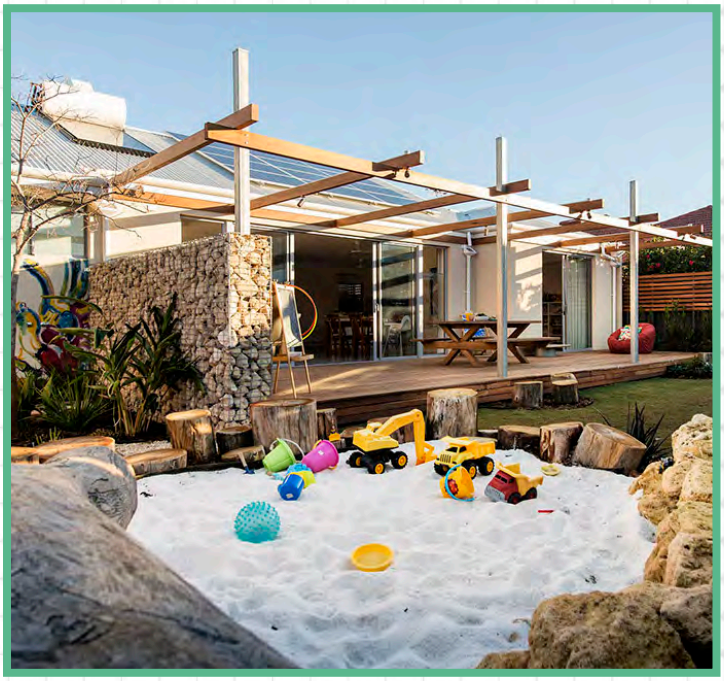
RESEARCH TEAM

The research project is being led by Dr Josh Byrne and Christine Eon of Curtin University with specialist input from CSIRO and Josh Byrne & Associates. The project will also draw on the experiences from other related CRCLCL and industry projects and activities.

CRC for Low Carbon Living

The CRC for Low Carbon Living (CRCLCL) is a national research and innovation hub that seeks to enable a globally competitive low carbon built environment sector and is supported by the Commonwealth Government's Cooperative Research Centres (CRC) programme.

With a focus on collaborative innovation, the CRCLCL brings together property, planning, engineering and policy organisations with leading Australian researchers. The CRCLCL develops new social, technological and policy tools for facilitating the development of low carbon products and services to reduce greenhouse gas emissions in the built environment. For more information visit www.lowcarbonlivingcrc.com.au/



PROJECT ACTIVITIES & ANTICIPATED OUTCOMES

Three ZEH display homes will be built in partnership with land developers in new display villages around Australia and used for data gathering and engaging industry. The activities for this project are grouped under three stages:

STAGE 1: RECRUITMENT OF PARTNERS

Stage 1 involved the recruitment of land developers and builders who will be responsible for the delivery of the ZEH display homes. Recruitment targeted different regions around Australia for the purpose of understanding the impact of different climate types and markets on cost and consumer interest. The first house is being built by Finlay Homes at North Shore in Townsville, a project by national developer Stockland that will eventually contain around 6,000 dwellings. The second will be built in Melbourne by SJD Homes in an established display village at the 750 lot Timbertop land estate in Officer by Parklea. The third house will be built in Canberra by Rawson Homes in the Stage 1 display village of the Ginninderry development, a joint venture between the ACT Government and Riverview Developments that will eventually include over 11,000 dwellings.

STAGE 2: DESIGN AND CONSTRUCTION OF THE ZEH DISPLAY HOMES

This phase will see the Research Team facilitate design support for the ZEH display homes. The design responses and materials used will be relevant to the particular location. The commonality to all the projects will be there need to work to agreed performance criteria and be targeted to the volume market. Each display house builder will be required to maintain cost documentation so that the cost implications of additional features or products that are linked to increased performance can be easily assessed and reported, with acceptance by industry.

STAGE 3: EVALUATION OF THE ZEH DISPLAY HOMES

In addition to capturing the practical industry learnings and detailed construction cost implications for the design and building phase as outlined above, information will also be collected on consumer and broader market interest in the features of the houses. A digital surveying tool will be used to enable feedback to be collected from visitors viewing the ZEH display homes and compare this to regular product of similar type in the same development. The survey will not be overtly 'sustainability' related but gather a wide variety of consumer preference data that can feed into the marketing departments of builders and developers. Video diary segments will capture the key stages of the project and will be used to communicate progress and learnings directly to industry via the CRCLCL and industry channels.

PROJECT SCHEDULE

Stage 1	
Secure partner developers/builders who are committed to building ZEH display homes and participate in the study with agreement on the methodology.	By June 2017
Stage 2	
Facilitate design support for the builders.	From Partner engagement through to commencement of construction
Apply (and test) industry leading evidence based tools for performance assessment.	By October 2017
Oversee cost estimation and documentation so that the cost implications of additional features or products that are linked to increased performance can be easily assessed and reported.	Throughout construction
Stage 3	
Undertake consumer research and market evaluation on the houses, plus performance monitoring.	January 2018 – September 2018
Reporting.	By December 2018
NOTE: The above timeline should be considered as a guide only.	

FURTHER INFORMATION

For more information on the project, please contact:

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REFERENCES

1. www.hia.com.au/~/media/HIA%20Website/Files/IndustryBusiness/Economic/fact%20sheet/3494_HIA2015_IndustryFactSheet_161115.ashx
2. www.yourhome.gov.au/energy
3. Saman, W.Y., Towards zero energy homes down under. Renewable Energy, 2012. 49: p. 211-215.
4. European Commission, Directive 2010/31/EU on the energy performance of buildings (recast). Official Journal of the European Union, 2010: p. L 153/13.
5. California Energy Commission, Integrated Energy Policy Report 2013. 2013.