

i-HUB

WARRIGAL SHELL COVE LIVING LABORATORY

SBRC SUSTAINABLE
BUILDINGS
RESEARCH
CENTRE



i-HUB

The Innovation Hub for Affordable Heating and Cooling (i-Hub) is an initiative led by the Australian Institute of Refrigeration, Air Conditioning and Heating (AIRAH) in conjunction with CSIRO, Queensland University of Technology (QUT), the University of Melbourne and the University of Wollongong and supported by Australian Renewable Energy Agency (ARENA) to facilitate the heating, ventilation, air conditioning and refrigeration (HVAC&R) industry's transition to a low emissions future, stimulate jobs growth, and showcase HVAC&R innovation in buildings.

The objective of i-Hub is to support the broader HVAC&R industry with knowledge dissemination, skills-development and capacity-building. By facilitating a collaborative approach to innovation,

i-Hub brings together leading universities, researchers, consultants, building owners and equipment manufacturers to create a connected research and development community in Australia.

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Warrigal Shell Cove



Warrigal Shell Cove i-Hub Living Laboratory

A 'Living laboratory' is a user-centred open-innovation, ecosystem within collaborative partnerships. The Warrigal Shell Cove i-Hub Living Laboratory establishes research-quality measurement and verification systems within an existing aged care facility, HVAC services and occupants in order to observe and evaluate technology upgrades within the context of the daily life of the aged care ecosystem. The technology upgrades trialled in this living laboratory will be selected from promising electric heating and cooling strategies that increase the energy flexibility of aged care facilities, and deliver increased value for renewable energy, at the site and grid level.

The living lab venue

The Warrigal Shell Cove i-Hub Living Laboratory is based in a world class aged care facility, where we will test and offer independent evaluations of the benefits of emerging HVAC&R, renewable energy and enabling technologies.

Warrigal Residential Care Home

- Heat Recovery VRF (variable refrigerant flow) air conditioning systems consisting of CUs (Condensing Units) that serve multiple indoor FCUs (Fan Coil Units).
- 128 beds and 6 Serviced apartments
- Area 9,171 m²

A non-exhaustive list of potential example retrofits technologies of high relevance to these sites include:

- BMS upgrade to provide automation management opportunities;
- Central thermal storage.
- Demand-side management solutions



The challenge...

Australia's aged care facilities will use an estimated 8.8PJ of energy in 2020. The provision of, or demand for, thermally comfortable environments through passive or active systems is a large driver for rising energy consumption in aged care facilities.

HVAC presents a significant energy and demand challenge to aged care communities with social, technical, economic and environmental consequences.

Approaches to the provision of renewable energy in these facilities tends to happen in an ad-hoc and silo- approach manner, often without holistic consideration of the occupants, buildings, technologies and electricity grid, and the management and control of that system.

What we propose...

This living laboratory research team will carry out rigorous testing and evaluation of a range of renewable energy compatible heating, cooling and ventilation technologies that deliver thermal comfort conditions conducive to a healthy living environment.

The living laboratory includes active engagement of the occupants and users of the facilities in the evaluation of these technologies.

HVAC&R systems will be installed and tested at Warrigal's Shell Cove Facility. This could include both passive and active systems with a focus on improving the value of renewable energy through energy efficiency, demand response (load shedding or load shifting), and ancillary services.

The potential for the tested solutions to be widely deployed across the aged care sector nationally will be explored.

As part of the project we provide...

- The means for energy flexibility and renewable energy enabling technologies to be independently and rigorously evaluated by using the available funding for the living labs.
- Technical reports on the tested technologies in first two years.
- Provide opportunity for technology providers to demonstrate practical and cost-effective strategies for aged care facilities to reduce energy demand and increase value of renewable energy, through the use of new technologies relating to HVAC control, demand management, and grid interoperability.
- Improved baseline metrics for energy consumption, demand and renewable energy specific to living lab venues. .

How to participate

Industry are invited to submit expressions of interest to participate with their products or services for testing.

Results for technologies evaluated using the iHUB funding will be publically made available, along with knowledge sharing activities through the Renewable Energy Knowledge Sharing Task-Group for Healthcare Sector, and development of the Renewable Energy and Enabling Technology and Services Roadmap for Healthcare Sector.

Submit an EOI to Clayton McDowell: claytonm@uow.edu.au

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